ScolaMAR

Erasmus+ Capacity building

Innovative training for Smart coastal management and Sustainable blue growth

Deliverable

Reports of mobility and pedagogical tool-kits

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UNIVERSIDADE DO ALGARVE

From	To	University	Staff name
14/10/2018	29/10/2018	Ibn Tofail Kenitra	FENJIRO Imad
		Ibn Tofail Kenitra	AL KARKOURI Jamal
		Ibn Tofail Kenitra	EL MAAQILI Malika
15/01/2018	26/01/2018	Abdelmalek Essaâdi Tangier	EL MOUMNI Bouchta
		Abdelmalek Essaâdi Tangier	EL M'RINI Abdelmounim
04/11/2018	17/11/2018	Abdelmalek Essaâdi Tangier	WAHBI Miriam
11/11/2018	25/11/2018	Mohammed V Rabat	BAKRI Youssef
		Mohammed V Rabat	RGUIBI IDRISSI Hamid
14/10/2018	29/10/2018	Ibn Tofail Kenitra	FENJIRO Imad
		Ibn Tofail Kenitra	AL KARKOURI Jamal

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[14/10/2018]** till **[29/10/2018]**
Duration (days) – excluding travel days: **14**

The Staff Member

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The sending university

Name	University IBN TOFAIL
Faculty/Department	Faculty of arts and humanities Departement of geography
Address	Campus universitaire BP242 14000 kenitra MAROC
Country	Morocco

Contact person

First/Last name(s)	Ait fora Abderramman
Position	professor

The receiving university

Name	Universidade do Algarve
Faculty/Department	Faculdade de Ciências e Tecnologia. Departamento de Ciências da Terra, do Mar e do Ambiente
Address	Campus de Gambelas 8005-139 Faro
Country	Portugal

Contact person

First/Last name(s)	**José Paulo Patrício Geraldes Monteiro**
Position	Professor

Type of mobility

☐ Technical skills
x Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[14/10/2018]** till **[29/10/2018]**
Duration (days) – excluding travel days: **14**

The Staff Member

Last name (s)	Al Karkouri	First name (s)	Jamal
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The sending university

Name	University IBN TOFAIL
Faculty/Department	Faculty of arts and humanities Departement of geography
Address	Campus universitaire BP242 14000 kenitra MAROC
Country	Morocco

Contact person

First/Last name(s)	Ait fora Abderramman
Position	professor

The receiving university

Name	Universidade do Algarve
Faculty/Department	Faculdade de Ciências e Tecnologia. Departamento de Ciências da Terra, do Mar e do Ambiente
Address	Campus de Gambelas 8005-139 Faro
Country	Portugal

Contact person

First/Last name(s)	**José Paulo Patrício Geraldes Monteiro**
Position	Professor

Type of mobility

☐ Technical skills
x Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[14/10/2018]** till **[29/10/2018]**
Duration (days) – excluding travel days: **14**

The Staff Member

Last name (s)	El Maaqili	First name (s)	Malika
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The sending university

Name	University IBN TOFAIL
Faculty/Department	Faculty of arts and humanities Departement of geography
Address	Campus universitaire BP242 14000 kenitra MAROC
Country	Morocco

Contact person

First/Last name(s)	Ait fora Abderramman
Position	professor

The receiving university

Name	Universidade do Algarve
Faculty/Department	Faculdade de Ciências e Tecnologia. Departamento de Ciências da Terra, do Mar e do Ambiente
Address	Campus de Gambelas 8005-139 Faro
Country	Portugal

Contact person

First/Last name(s)	**José Paulo Patrício Geraldes Monteiro**
Position	Professor

Type of mobility

☐ Technical skills
x Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

- Development of a structured and integrated cooperation in Water and Environmental Sciences Higher Education;
- Improve and promote High Education Level in the field of Water and Coastal Management; Join resources and fill gaps between field studies, the academia, the governance bodies and economic agents;
- Promote an interdisciplinary advanced training and education in order to create skills and competencies to the future generation of researchers and managers in Water and Coastal Management.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	Sunday 14/10/2018	Arrival in Lisbon
2	Monday 15/10/2018	Arrival in Faro and installation
3	Tuesday 16/10/2018	Visit to the two universities of Faro *(*Universidade do Algarve *Campus da Penha,* Universidade do Algarve *Campus de Gambelas)* and meeting with Professor José Paulo Patricio Geraldes Monteiro. The meeting
4	Wednesday 17/10/2018	Preparation for the field trips:In order to apprehend the water related phenomena in the Algarve region we have organized a working session to prepare the field trip that Mr José proposed. During this session we conducted a research on algarve region and we consulted the documents sent by Pr. Monteiro.
5	Thursday 18/10/2018	Field trips: It was very interesting because the area visited is given by Professor Monteiro to the students of the Master's degree as an example of watershed and aquifer management in Algarve. This allows seeing how the articulations between the course and the field are made.
6	Friday 19/10/2018	Second meeting with Professor José Paulo Patricio Geraldes Monteiro. Presentation of the Master's degree *Water and Coastal Management - Erasmus Mundus.* The master focuses on the application of the latest technologies and approaches to the study of the catchment and coast the Sea. A fruitful discussion followed the presentation it focused on the following points: - Course structure; - Educational materials and tools used; -Various approaches - The key points of a successful course; - Constraints and difficulties encountered; - Solutions and proposals;

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7	Monday 22/10/2018	Third meeting with Professor José Paulo Patricio Geraldes Monteiro. In this meeting the professor outlined the various projects in which his laboratory is involved as well as the different methods used in this research.
8	Tuesday 23/10/2018	Visit to the library. We have been interested in the documents made available to the students of the various masters, in particular the documents that interest the field of coastal management.
9	Tuesday 25/10/2018	Organization of a discovery visit along the FARO city coast.
10	Friday 26/10/2018	Visit to the CTA – Centre for Water Sciences and Technologies
11	Sunday 28/10/2018	Departure of Lisbon

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

Our scientific stay in Faro was an opportunity to discover new approaches used in teaching in masters. The field trip was an opportunity to discuss the relationship between the reality of the territory and the models taught. Mobility allowed us to familiarize ourselves with other software and models used in water and coastal development research.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

The results of our scientific visit were discussed with the dean of the faculty and the professors interested. A report has been written and will be submitted to our laboratory to be consulted by our colleagues.

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ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

Some photos of various activities

Trip field

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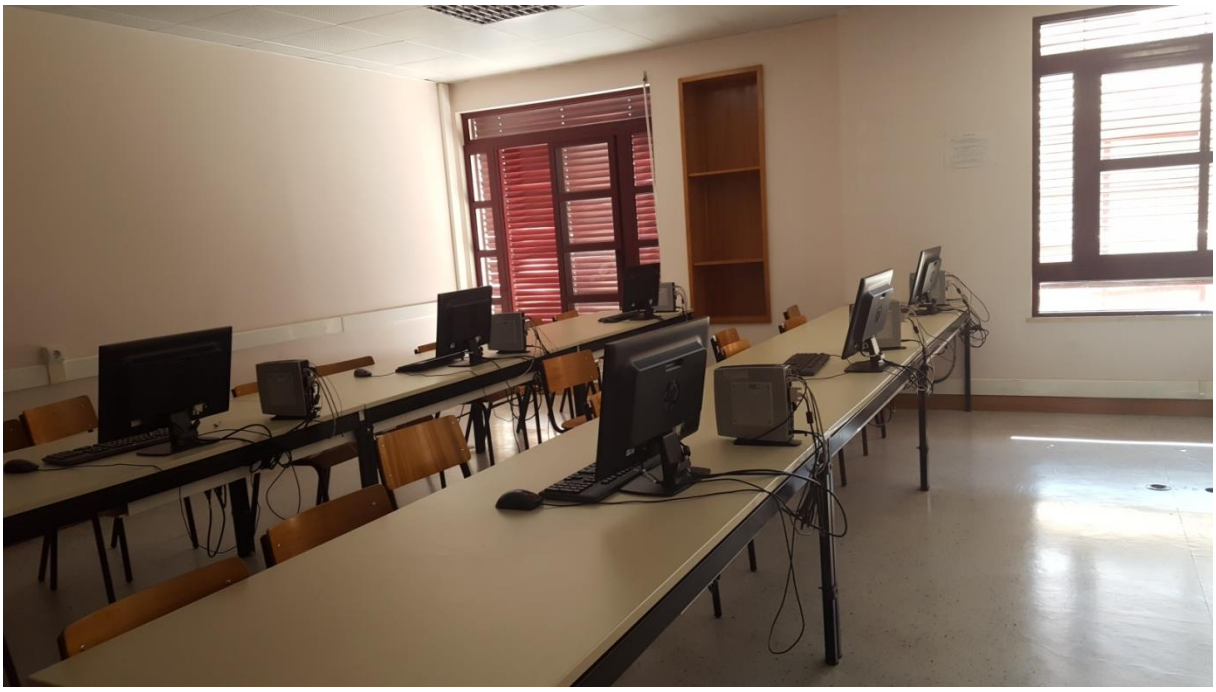
Visit to the library



Visit to the classroom

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Working session with Professor José Paulo Patricio Geraldes Monteiro

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PEDAGOGICALTOOL-KIT
Teaching module

Module title	**LITTORAL GEOMORPHOLOGY**
Thematic(s)	
Type of module *(Select one or more boxes)*	☐X Lecture course ☐ Tutorial exercice ☐ Practical exercice ☐ Group workshop ☐X Field trip ☐ Other – precise:

Teaching manager	FENJIRO IMAD
Speakers *(Precise if external speakers)*	?

Year / Semester	MASTER, SEMESTER 1 OR 2 : GEOGRAPHY, GEOLOGY, DEVELOPMET TECHNICIANS…
Number of hours	30 HOURS
Number of groups	1 GROUP

Objectives	TO NOW THE ASPECT AND THE GEOMORPHOLOGICAL EVOLUTION OF THE DIFFERENT COMPONENTS OF A COSTLINE
Content	The course will be formulated in the form of axes concerning the geomorphological aspect of the multiple components of the coastline: -The beaches: Morphology and appearance, beach erosion (retreat and loss of weight), natural and anthropogenic causes of their fragility. -The coastal dunes: formation and different types -The cliffs: formation and evolution -Lagoons: types of lagoons and morphological elements -The estuaries: origin, sedimentary phenomena -The deltas: morphology and training Conclusion: Examples of human-induced degradation aspects of these coastal features.
Teaching methods	DATA SHOW , MAPS, AERIAL PHOTOGRAPHS, SATELLITE IMAGES
Knowledge required	Basics in Physical Geography or Geology
Skills required	
Equipment required	PURCHASE OF SATELLITE IMAGES AND AERIAL PHOTOGRAPHS AS WELL AS TOPOGRAPHIC AND GEOLOGICAL MAPS

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Type of evaluation *(Select one or more boxes)*	☐X Oral – precise: report of the fieldwork ☐X Written – precise: questions about the course ☐ Other – precise:
Comments on evaluations *(Precisions on criteria)*	Know how to synthesize the course Know how to report the work of the field Know how to read and explain maps

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PEDAGOGICALTOOL-KIT
Teaching module

Module title	SUSTAINABLE MANAGEMENT OF WATER RESOURCES IN THE LITORAL
Thematic(s)	
Type of module *(Select one or more boxes)*	☒ Lecture course ☐Tutorial exercice ☒ Practical exercice ☐Group workshop ☒ Field trip ☐Other – precise:

Teaching manager	ELMAAQILI MALIKA
Speakers *(Precise if external speakers)*	

Year / Semester	1 SEMESTER
Number of hours	**50**
Number of groups	4

Objectives	Strengthen the skills of human capital to meet the challenges of sustainable management of water resources in coastal areas. Train professionals able to meet the needs of sustainable management and the protection of coastal ecosystems. Acquisition of methodologies for studying the mouths of rivers and coastal territories
Content	I) Specificities of coastal areas This chapter will be devoted to the presentation of the littoral zone as an ecosystem which has its particularities, and which needs adapted adaptations II) Policies and public actions This chapter presents the complexity of systems and stakeholder plays in the management of coastal water resources, as well as the importance of a management based on the consultation of the various actors in the use and management of water: water for human use (purification, potabilisation) III) Strategies for sustainable management of coastal waters: -Production of clean energy, -Disalination of seawater, -Adaptation to immersion phenomena for sustainable management
Teaching methods	PRACTICAL WORK COURSES

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Knowledge required	Knowledge in hydrology, environment and resource management
Skills required	Acquisition of methodologies for the study of mouths of rivers and littoral territories
Equipment required	DATASHOW LOGICIEL DE CARTOGRAPHIE CARTES PHOTOS AERIENNES IMAGES SATELLITAIRE
Type of evaluation *(Select one or more boxes)*	☐Oral – precise: ☐Written – precise: ☐Other – precise:
Comments on evaluations *(Precisions on criteria)*	Continuous control 25% 75% end-of-semester exam The module is validated if the grade obtained in this module is greater than or equal to 10 out of 20

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MOBILITY AND ACTIVITY REPORT
Job-Shadowing

Period of the mobility: from **[15/01/2018]** till **[26/01/2018]**
Duration (days) – excluding travel days: 12

The Staff Member

Last name (s)	El Moumni	First name (s)	Bouchta
Nationality	Moroccan	AcademicYear	2017 - 2018
Position	Professor, Dean		
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The sending university

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Address	Ancienne route de l'aéroport – BP. 416 – Tanger
Country	Morocco

Contact person

First/Last name(s)	Houdaifa Ameziane
Position	President of the university

The receiving university

Name	University of Algarve
Faculty/Department	Faculty of Sciences and Technology
Address	Campus of Gambelas, Building 7, 8005-139 Faro
Country	Portugal

Contact person

First/Last name(s)	Adelino Vicente Mendonça Canário
Position	Professor

Type of mobility

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☐Technical skills

✓ Innovative pedagogical approaches

MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The choice of the University of Algarve is linked to the excellence of the reception team in the field of coastal management. The main objective of this mobility is to update knowledge on coastal management in relation to tourism activities on the one hand and the decline of beaches in relation to sea level rise and coastal erosion on the other hand.

The mobilities defined in the Scolamar project aim at perfecting the teaching staff of the four Moroccan universities involved in the project. The exchange of experience and good practices with colleagues from European universities will allow the transfer of expertise and good practices for the development of an international master for the blue economy in Morocco.

As coordinator of the project in Tangier and initiator of the project, I wanted to learn more about coastal management and the impact of human activities on the stability of the coastline along with the marine pollution that is already part of my skills. The University of Algarve has a great experience in this field. Indeed, (Centro de Investigacion Marinha e Ambiental (CIMA), Universidade do Algarve) offers an international master's course to students from the four continents of the planet for the acquisition of knowledge directly applied to the management of the coast. This Master (see below) entitled :

«MARINE AND COASTAL SYSTEMS MASTER PROGRAMME (MACS - SIMCO)

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	15/01/2018	- Transfer from Hotel to University of Algarve Faculty (Faculty of Science and Technology) by ScolaMar project coordinator, Professor Adelino Vicente Mendonça Canário;

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		- Presentation to the staff who will accompany us during the Job shadowing and facilities. - Discussion about the objectives and relevance of a course in marine morphodynamics, for the best pedagogical practices and the importance of field work in marine morphodynamics. - Discussion with Pr. Moura Delminda about the proposed ScolaMAR Master's project, student profile, pedagogical approaches and the philosophy of the project Scolamar. - Discussion with the other partners about the program of this stay and future cooperation. - Detailed presentation of the course on coastal morphodynamics by Pr. Moura Delminda.
2	16/01/2018	- Full day on Fieldwork with Professor Moura on the rocky coasts of Algarve betwenn Lagos and Albufeira to discuss the morphodynamics of this particular type of coast and pocket beaches. We made three stops: 1: Baia Grande; 2: Galé; 3: Praia Maria Luisa.
3	17/01/2018	- Deep discussion with Pr. Moura about the pedagogical approach explaining to students the aspects of the Lagos region. Approach thshow to students how they can control the geomorphology of the coast and preserve the quality of beaches. - Practical examples of exercises on marine morphodynamics given to students.
4	18/01/2018	- Presentation of concepts given on the coastal hazards course by Professor Óscar Manuel Fernandes Cerveira Ferreira. - Presentation of the international master (description below) managed by Pr Óscar Manuel Fernandes Cerveira Ferreira: *" Marine and Coastal Systems* ", with 70% of the students are foreigners and 35% are from outside Europe (2017-2018) - This Master's degree forms a competent and rapidly operational human potential in coastal management. The laureates are solicited by the private sector and the public administration of their respective countries. - Discussion about the taught modules and their relevance. - Discussion on the problem of beach erosion in Portugal and the cost of beach nourishment related to the economic aspect and the intense touristic activities in the region. - Discussion and examination of documents presented by Pr. Ferreira about geohazards : Method RiscKit (namely the CRAF).
5	19/01/2018	- During the morning (Pr. Oscar Ferreira): Field visit to Praia de Faro in order to illustrate and analyse some aspects of coastal hazards like erosion and submersion.

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		- Evaluation of the consequences on the littoral stability and economic building on the coastal zone. - During the afternoon discussion about the historical and future interventions, conflicting uses, beach nourishment, management. - Exercises on setback lines (erosion and sea level rise).
6	22/01/2018	-Full day of case studies with exercises on overwash and risk cartography with Pr. Oscar Ferreira. - Presentation and demonstration of case studies around the world (Europe, USA, Asia ...)
7	23/01/2018	- During the morning field visit with Pr. Oscar Ferreira to the sandy coast between Vilamoura and Vale do Lobo. Human interventions and coastal management issues. -Afternoon with Professor Joaquim Manuel Freire Luís: geophysical approach • Presentation of principles of tsunami generation and propagation. • Example of running a short simulation.
8	24/01/2018	-Morning (Prof. Joaquim Luis): Grid creations. The concept of nesting grids and how to compute them. -Afternoon : Conference presented by myself on the coastal erosion on the Moroccan Mediterranean coast: case of the bay of Tangier; Presentation of the various aspects of research undertaken in the UAE and specifically to the FST-Tangiers concerning erosion, coastal pollution, the impact of climate change, sea level rise and soil erosion Discussion with the present and prospects for future cooperation
9	25/01/2018	Professor Joaquim Luis: Running a simulation at high resolution with demonstration and computer simulation of aspects related to floods, tsunamis, migration of pollutant spots etc. inundation.
10	26/01/2018	- Discussion with the Portuguese colleagues who worked with us, Pr. Abdelmounim El M'Rini and myself for the joint. - Participation in the future International Master in the framework of the Scolamar project. -Shared participation in the various H2020 tenders and the possibility of exchanging trainees and doctoral students in a near furtur. Group photo and goodbye.
My thanks go to the European Commission-Erasmus Plus for the funding of ScolaMar, and to the Portuguese colleagues who have made a great effort to make this stay interesting in pedagogical, scientific and good conditions.		

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ADDED VALUE

The added value of this mission consists in:- Complement my training and my knowledge in coastal management coastal risk management, proposing solutions adapted to sustainable development for the preservation of the coastal environment.
This job shadowing allowed me the acquisition of a broader vision allowing me to provide a course in the future Master Scolamar. Port, airport, tourist and urban coastal infrastructures directly or indirectly influence the stability of the coastline. Training future mangers of the littoral in the spirit of sustainable development is a priority of the objectives set by ScolaMar.

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

This mobility has a certain added value because it will help me to:

- To reinforce Moroccan capacities in terms of Smart coastal management and Sustainable blue growth in a context of rapid economic growth affecting the coastline.
- To prepare highly qualified and autonomous graduates able to respond to the national and international strategy of Integrated Coastal Zone Management.
- To reduce the mismatch between the academic offers and the work market in the field of Marine Sciences and Coastal management to increase the employability in Morocco.
- Acquiring new technical, innovative pedagogical and integrative skills
- Ability to implement an innovative specialized approach for coastal management in marine and coastal sciences for ICZM and Blue Growth

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

The main impact of this mobility is the improvement of the course provided in coastal management for sustainable development, by the preparation of a human potential that is competent in this field and respectful of the environment.
The dissemination will be done using, through internal meetings and seminars, and with students of our Master (Sciences de l'environnement) and in web site ScolaMar.

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ANNEXES

MARINE AND COASTAL SYSTEMS MASTER PROGRAMME (MACS - SIMCO)

TEACHING METHODS

- Taught modules, core and optional research training modules
- Field work and field visits (more than 50h) and use of field equipment
- Laboratory work (more than 200h) and use of extensive laboratory facilities and equipment
- Science communication in seminars
- Scientific diving (optional)

DURATION OF THE STUDY PROGRAM:

2 years (4 semesters), 120 ECTS, full time

1st Semester

- Large Scale Ocean Processes
- Geology and Geophysics of Ocean Basins
- Marine Morphodynamics
- Marine Trophic Dynamics
- Anthropic Disturbances of Marine Systems
- Monitoring of Marine Systems

CLICK HERE FOR MORE INFORMATION >

2nd Semester

- Coastal Oceanography
- Remote sensing and marine cartography
- Modelling of Marine Systems
- Oceanographic Data Analysis
- Option I – Oceanographic Research Cruise
- Option II – Fundamentals of Scientific Diving in Oceanology (Optional)

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CONTACTS

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http://www.ualg.pt/home/pt/curso/1740

3rd Semester

- Eutrophication and Harmful Algal Blooms
- Isotopic Tracers of Marine Processes
- Coastal and Marine Hazards
- Records and Measures of Environmental Changes
- Basin Analysis
- Dissertation Plan – Seminar

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4th Semester

- Dissertation

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ScolaMAR

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The Centre for Marine and Environmental Research (CIMA) was created in 1998 and is a leading multidisciplinary Research Unit at the University of Algarve (UAlg). CIMA's mission is to promote scientific knowledge and innovation in environmental areas, with special focus on the marine and coastal realms.

CIMA's goal is to ensure sustainable, integrated and smart development in agreement with the EU priority investigation themes for 2020, related to "Climatic action, sustainable ecosystems and environmental resources".

CLIMATE VARIABILITY

PAST, PRESENT AND FUTURE

Paleoenvironments, climate proxies, continental shelf, sea-level rise, aeolian activity, stalagmites, phytoplankton, primary production adaptation strategies.

OCEANS

OCEAN OBSERVATION

Ocean surface circulation and productivity, operational oceanography, remote sensing, modeling, downscaling, chemical and physical oceanography, microbiology, deep-sea resources exploitation, deep-sea ecotoxicology

TRANSITIONAL WATERS

ESTUARIES AND LAGOONS

Observations, hydrodynamics, ecology, quality, currents, nutrients concentration, exchange with ocean, upwelling, management.

COAST

COASTAL PROCESSES AND RISKS

Coastal barrier dynamics, risk assessment, waves, erosion, retreat, dunes, management, risk reduction, resilience overwash, inlet dynamics.

ENVIRONMENTAL QUALITY AND REMEDIATION

Water quality assessment, surface water bodies, groundwater, soils, pollution, environmental risk, ecotoxicology, microplastics bioremediation, food quality human health.

ENERGY AND RESOURCES

Renewable energies, biofuels, biorefinary, sustainability marine energy, Aeolian energy, deep sea mineral resources.

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Examples of exercises:

Marine Morphodynamic
Exercises on sediment transport

Objective: to understand why knowledge on sediment transport is important

1- The artificial nourishment of a given beach is frequently the only way to keep sand there. However, the successful of that action depends on the knowledge of the morpho-hydro-sedimentary processes. The future stability of the nourished beaches relates directly to grain size. Additionally, the knowledge on cross and alongshore transport is of fundamental importance.

1.1- Explain why the successful of the artificial nourishment of beaches is dependent , among other variables, on the sediment´s grain size.

1.2- Observe Figure 1 and write a sentence which synthetises the relationship between beach slope and grain size.

1.3- Witch is the mean grain size on beaches steeper than 10°?

1.4- Based on Figure 1, write an empirical formula, relating the beach slope and the grain size

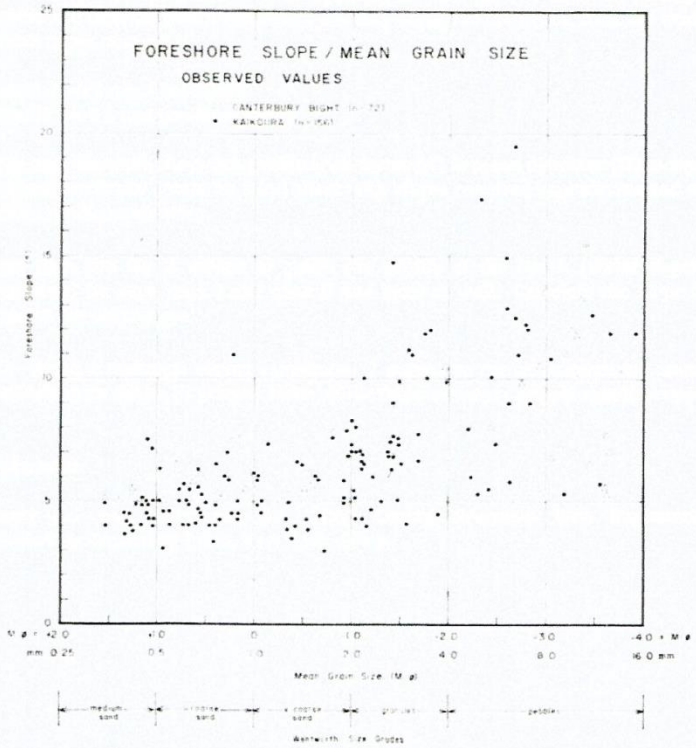

Figure 1- Observed relationships between gran size and beach slope in Kaikoura beach, after Mclean and Kirk, 1969

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Marine Morphodynamic
Exercises on sediment transport

2- The relationship between mean grain size and beach slope at a given depth of the water column in the nearshore may be easily calculated using the follow expression (Dean & Dalrymple, 2002):

$h = Ay^{2/3}$ (1) Where, **h** is the depth of the water at **y** distance seaward from the shoreline and **A** is a *profile scale factor.*

The relationship between **A** and the settling rate of the sediment (**w**) is nearly linear:

$A = 0{,}067\ w^{0.44}$ (2)

and, $w = 14\ D^{1.1}$ (3) where, **D** is the mean diameter

2.1- Explain the relationship between the sediment settling rate and the grain size.
2.2- You are a consultant of an environmental management agency and you are asked for technical advice concerning a beach nourishment. After several storminess winters that beach, lost sand and became imbalanced. Thus, its is necessary to feed artificially the beach. The local sand in the nearshore has a mean diameter of 0,12 mm. In order to restore the equilibrium profile and thus the beach resilience, you may dredge to the beach, from the nearby sea floor, one of two types of sand:

Sand I: D=0,2 mm (fine sand)
Sand II: D= 0,5 mm (medium sand)

Step one: Calculate the beach profile scale factor (**A**) to mean diameter (**D**) to sands I, II and local Suggestion: firstly create an Excel sheet with all the required expressions and than calculate the values of the parameters.

Step two: Use the **A** values to graph the profile of the beach (water depth vs. distance to shoreline) for both sand I and sand II and local as well. Calculate the slope for all situations. Explain the differences.

2.3- Write a technical report (maximum 2 pages) to the environmental management agency, justifying you choice (5 points). Note: all the team members should sign the report.

Reference

Dean, R.G. and Dalrymple, R.A., 2002. Coastal Processes with Engineering Applications, Cambridge University Press, New York, 474 p.

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Marine Morphodynamics
Exercises on sediment transport

Objective: to propose environmental remediation solutions

Rationale

The alongshore transport is the balance between sediment supply and sediment sink and, negative and positive transport (see figure 1)

$Q_{net} = Q1 + Q2$
$Q_{gross} = |Q1| + |Q2|$

Q- solid transport thousands cubic meter per year
Q1 (positive value) Transport along the main direction of the waves approaching the coast or favouring the beach fill (supply)
Q2 (negative value) Transport opposite to the main direction of the waves approaching the coast or sediment sink

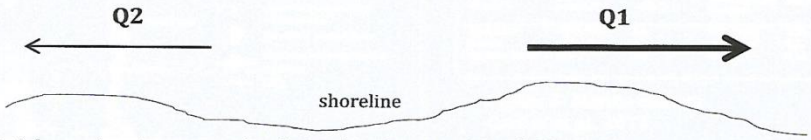

Figure 1- Schema showing geometric relationships between Q1 and Q2

Sediment budget

$\Sigma Q_{source} - \Sigma Q_{sink} - \Delta V + P - R = Residual$

If residual is zero, the littoral cell is in equilibrium

P = beach fill, dredged placement
R = dredging, mining
ΔV = Beach erosion/accretion

Exercise 1- The northern France near Dunkirk characterizes by extensive estuarine areas of high ecological value (Figure 2). However, those areas are in risk of being invaded by marine sands. Additionally, the 300 to 800 m wide beaches are gentle sloping. The presence of several sand banks on the shore-face and inner shelf dissipate large amount of the waves energy. Tidal regime is a macrotidal (6 to 10 m of tidal range; see figure 3 for details).
Note: Exercise 1 is based in a case study by Cartier et al., 2013.

1.1- **Why** the inner-shelf and shore-face of the northern of France characterizes by such amount of sand banks (Figures 2 and 3)?

1.2- The alongshore sediment transport ranged between 1×10^{-4}. $Kg.s^{-1}.m^{-1}$ associated mainly to waves showing Hs< 0.3 m and 1×10^{-3}. $Kg.s^{-1}.m^{-1}$ for higher waves. However, higher volumes of sediment transport were also observed in relation with waves of Hs=0,2 m.
The measured mean flow velocity of 0.5 $m.s^{-1}$. These values are similar to the ones obtained on micro and meso tidal regimes and other macro tidal beaches as well.

What do you conclude based on the above exposed and on figure 4**? In your opinion** what is the first order environmental variable controlling the alongshore transport?

1.3- **Criticize** the experimental design showed in Figure 5. **Propose** another one aiming the same goal.

1.4- **What solution** you propose in order to avoid the complete silting of the estuaries in the zone?

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Marine Morphodynamics
Exercises on sediment transport

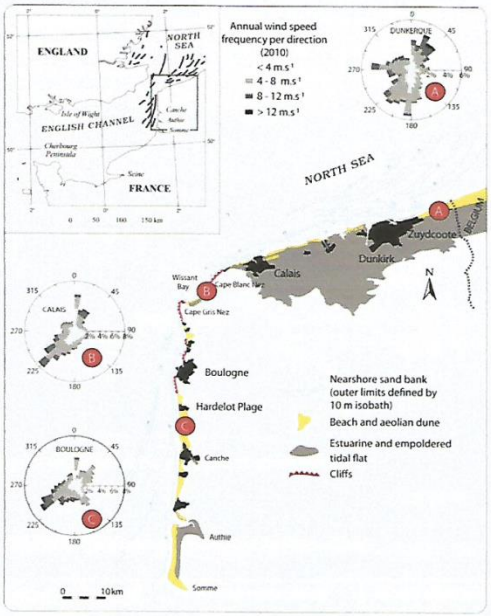
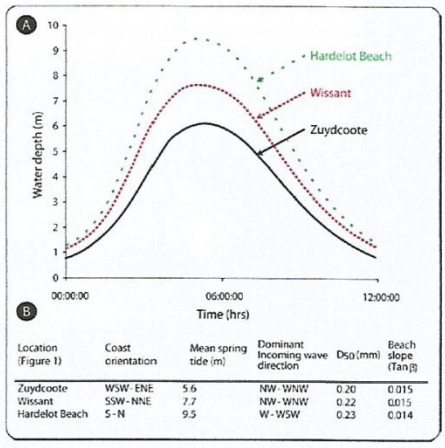


Figure 2- Coast of northern of France (Cartier et al., 2013)



Location (Figure 1)	Coast orientation	Mean spring tide (m)	Dominant Incoming wave direction	D50 (mm)	Beach slope (Tan β)
Zuydcoote	WSW-ENE	5.6	NW-WNW	0.20	0.015
Wissant	SSW-NNE	7.7	NW-WNW	0.22	0.015
Hardelot Beach	S-N	9.5	W-WSW	0.23	0.014

Figure 3- Marine climate
Cartier et al., 2013

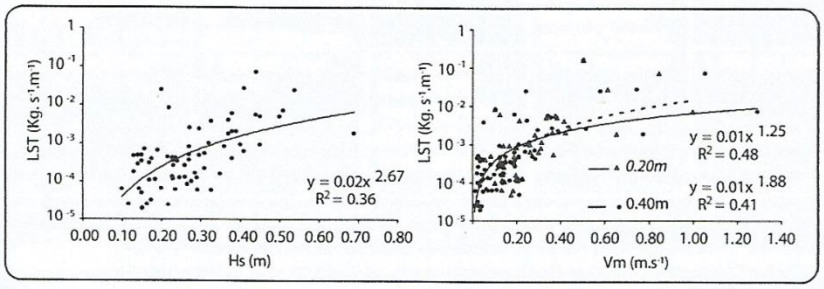


Figure 4- Relationship between alongshore transport (LST) and marine climate (Cartier et al., 2013)

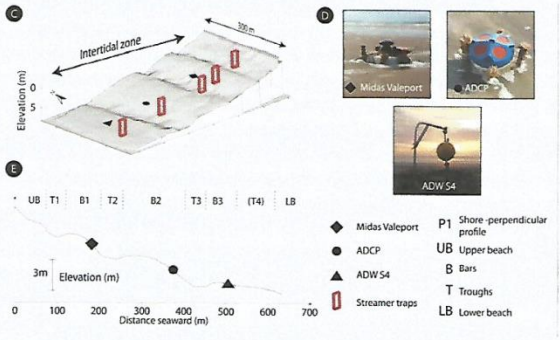


Figure 5: experimental design (Cartier et al., 2013)

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Marine Morphodynamics
Exercises on sediment transport

Exercise 2- It is of utmost urgency to provide protection to a coastal town (Fig. 6), which is being destroyed by waves every year. The government believe that the solution lies in building groins. Table 1 resumes the field data acquisition along one year. **Which solution** your consulting firm will advise to the government? **Why**?

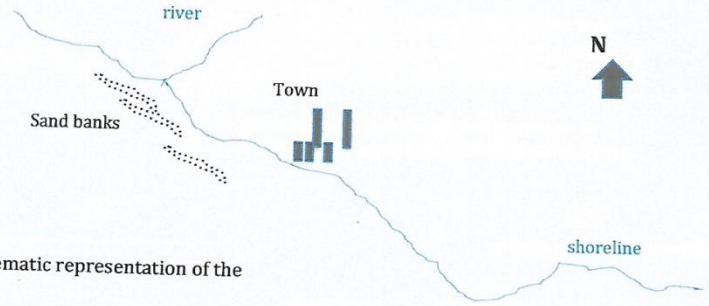

Figure 6- schematic representation of the

Table 1- Sediment transport information

Mean volume of sediment transported when waves approached from SW (70 % of the year)	***Mean volume of sediment transported when waves approached from SE (25% of the year)***	***Mean diameter of the fluvial particles***	***Total volume of sediment transported by the river to the beach during the observed period (1 year)***	***Volume of sediment transported to sand banks in the lower shoreface***
6 4000 m^3/day	2 300 m^3/day	60% of fine sand (0,20 mm) and 40% of mud (< 0,063 mm)	1 900 m^3/year	1 140 m^3/day

Exercise 3- The sediment grain size is a key-characteristic on sediment transport. Report other two properties you believe to be important for this process and explain why.

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Exercises on morphosedimentary characterization of the continental shelf

Objectives:

(i) to interpret hydrographical maps; (ii) to identify the inner and outer limit of the continental shelf, (iii) to quantify the width, slope, and depth of the continental shelf, (iv) to identify and characterize the main morphological aspects of the continental shelf.

Methodology:

a) This work is to be carried out in 3 students- groups.
b) Each group will study a continental shelf sector.
c) It is expected that this exercise will be extended by two practical classes, as follow: 1st class and 1/3 of the 2nd one: each group works independently; 2/3 of the 2nd class: each group transmit their knowledge to the entire class. At the end, conclusions shall be drawn.

1- Read carefully all the information on the hydrographical map on which you are going to work.

2- Identify the outer edge of the continental shelf. What criteria did you use for this? At what water-depth is located?

3- Identify the inner boundary of the shelf and characterize it for the physiography and orientation. What relationship do you find between the orientation of the outer edge of the shelf and the coastline?

4- Can you individualize the continental slope and continental rise on the map you're working on? If so, what criteria did you use?

5- What is the average width of the continental shelf sector you are studying? and the average slope? if there are very large differences, divide the area into sub-sectors and characterize them individually.

6- Identify particular morphological aspects in the sector of the shelf you are studying (e.g., canyons, islands, depressions). Characterize them for orientation, shape, dimensions and depth.

7- Is there a hydrographical network that drains to the coast? What is the influence on the shelf morphology?

8- Are there any morphological or sedimentary features that are not in balance with the current environmental conditions? Which are? How do you justify their occurrence?

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Marine and Coastal Sistems
Marine Morphodynamic- Exercises P4

Objectives: (i) Schedule a field campaign which goal is to calculate the depth of mix, in what concerns (i) required information to program the field work, (ii) the data that is necessary to acquire, (iii) required material to acquired the wanted data, (iv) number of teams and people/team and (v) methodology; (ii) Quantify the active layer; (iii) characterize the geomorphic state of a beach.

Rationale

Beaches behaviour is of fundamental interest on coastal evolution as well as of practical importance. Beach nourishment is a viable engineering alternative for shore protection and an important technique for beach restoration, requiring the knowledge on dynamic processes and displaced sand volumes over several spatial and temporal scales.

Waves breaking oblique to the coast generate alongshore currents in the surf zone that flow parallel to the shore capable of transporting large amount of sediment (alongshore drift). When waves approach the coast, the percentage of breaking waves and the ratio of significant wave height to the water depth (H/h) increases toward the shoreline and breaking of individual waves occurs gradually with the larger ones breaking first distant from the coast and the smaller ones breaking near the shoreline.

The surf zone width depends on the slope of the shoreface and type of breakers and, in turn, the shore face slope is dependent of the grain size.

The importance of knowing the sediment transport rate is well expressed by the numerous attempts to access it both through direct measurements in the field and numerical models.

The amount of the transported sediment in a given time interval should be assessed two-dimensionally. Thus, in addition to know the distance travelled by the sediment, it is also necessary to assess the depth of the layer where occur active exchanges of sediment: depth of mix. The determination of the active layer is also fundamental to evaluate the amount of micro-plastics or other contaminants in the system.

Exercise 1

Read carefully the rationale that introduces the exercises and identify the variables required to calculate the depth of mixture (active layer) and further the alongshore transport rate. Fill the table 1.

Table 1- Environmental variables accounting for the sediment transport rate in a sandy beach

Wave parameters	Beach parameters	Sediment parameters	Other parameters you think are important

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Exercise 2

You are applying for funds to develop a scientific research on sediment transport, with links to coastal management and engineering solutions on coastal remediation. All projects should include a detailed work-plan. Discuss with your colleagues and point an expedite methodology easy to perform in the field to assess the depth of mixture:

Schedule a fieldwork campaign to assess the depth of mixture, follow the steps:

1º) Previous information required;

2º) Which is necessary to observe and measure? Which data you need? How do you intent do measure? Which material is necessary? Fill the table 2.

Table 2- Work-plan; schedule of fieldwork to access the depth of mixture

TASKS	MATERIAL	PEOPLE (team)	OTHER

Exercise 3

Figure 1 represents the behaviour of a beach along three profiles in in two consecutive days. Table 2, resumes the field data of waves and wind.

Calculate the layer mixture depth using the follow empirical formulae:

$Z_m = 0.027\ H_b$ (Kraus, 1985)

$Z_m = 0.27\ H_b$ (Ciavola et al., 1997)

$Z_m = 1.86\ H_b \tan \beta$ (Ferreira et al., 2000)

Where, Z_m = layer mixture depth; H_b is the waves' height at the breaking point; β ⓘ? the beach-face slope.

Compare the values between the used formulae. Which formula you believe is the more suitable to estimate the depth of mixture? Justify you answer.

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Exercise 4

Based on table 2, estimate the geomorphic state of the beach using the surf scaling parameter (ε) after Guza and Inman (1975)

$$\varepsilon = \frac{2\pi^2 H_b}{gT^2 tan^2 \beta}$$

Where Hb is the wave height at the breaking point, T is the waves period and β is the beach slope. π is the pi number (3.14) and g the gravity acceleration (9,8 m/s).
The beach is reflective is $\varepsilon < 1$ and dissipative if $\varepsilon > 30$. In between is of intermediate state.

Table 2- field data. Onshore wave height is breaking height (Hb)

Wave climate						Wind			
Wave height		Wave period		Wave direction					
Offsore data	onshore	Offsore data	onshore	Offsore data	onshore	wind direction	Wind force	Beach slope	
Hs = 0,33 m	0,43 m (11 observations	T m= 4,4 s	5 s	WSW	220º	NNE	2,1 m/s	3,78°	Profile 1
Hm= 0,53	0,25 m (6 observations)	Tmax= 11,7 s	10 s		220	NW	4,65 m/s	4,4°	Profile 2
	0,26 m (21 observations)		15,7 s		SW	NW	4,65 m/s	4,0°	Profile 3

Exercise 5

Use table 2 to answer:

a) The offshore wave direction is in phase with the wind in the coast? Why?
b) Justify the observed differences between the offshore and onshore Hs
c) The relationship between the wind velocity (V) and the wave height (H) is expressed by the formulae (1). Is the wind velocity in accordance to the wave height?

$$H = 0{,}031\ V^2$$

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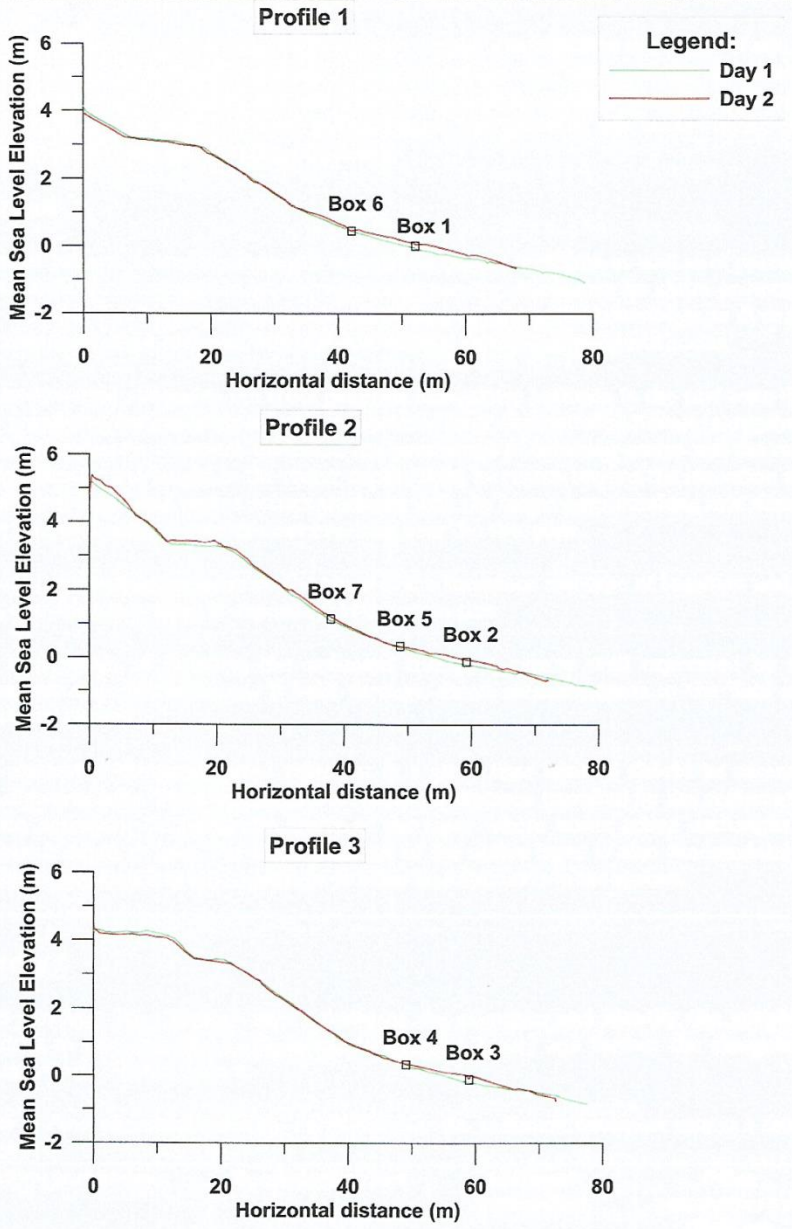

Figure 1- Beach profiles in two consecutive days

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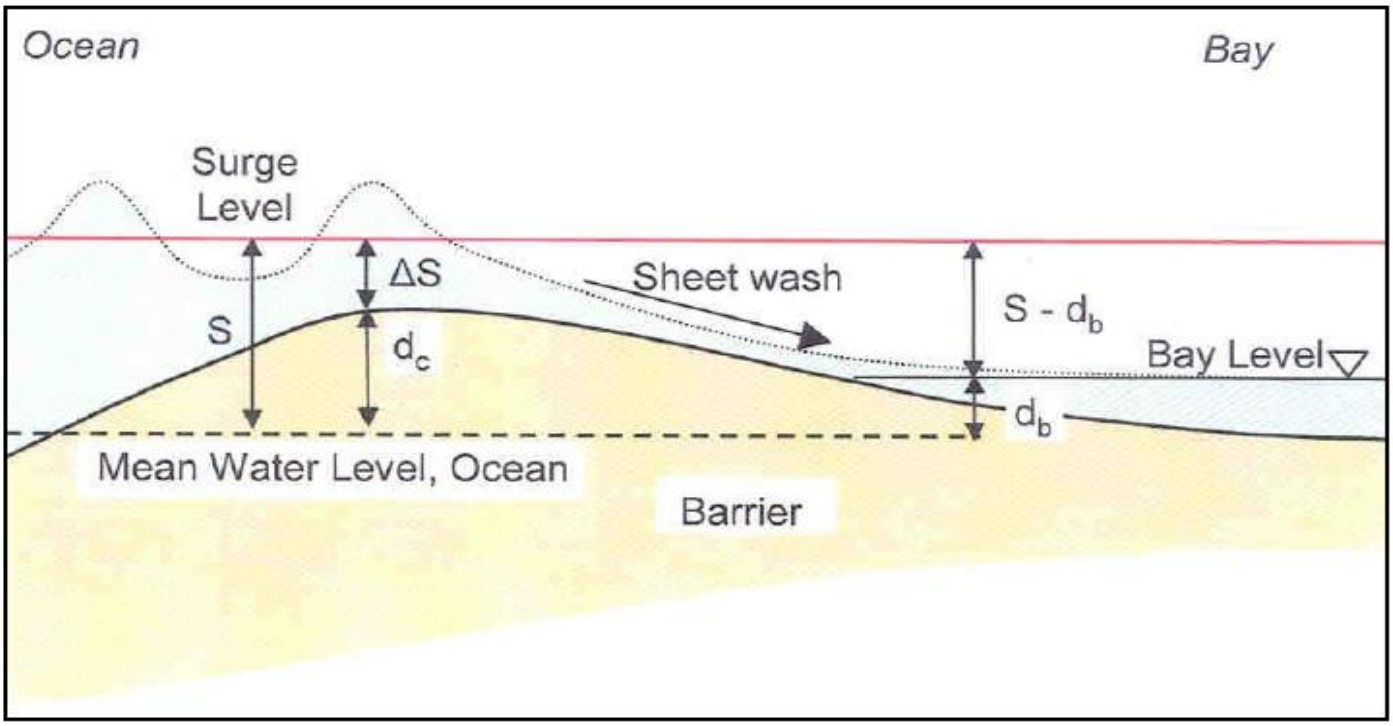
INUNDATION

Overwash vs inundation

Sallenger's (2000) classification



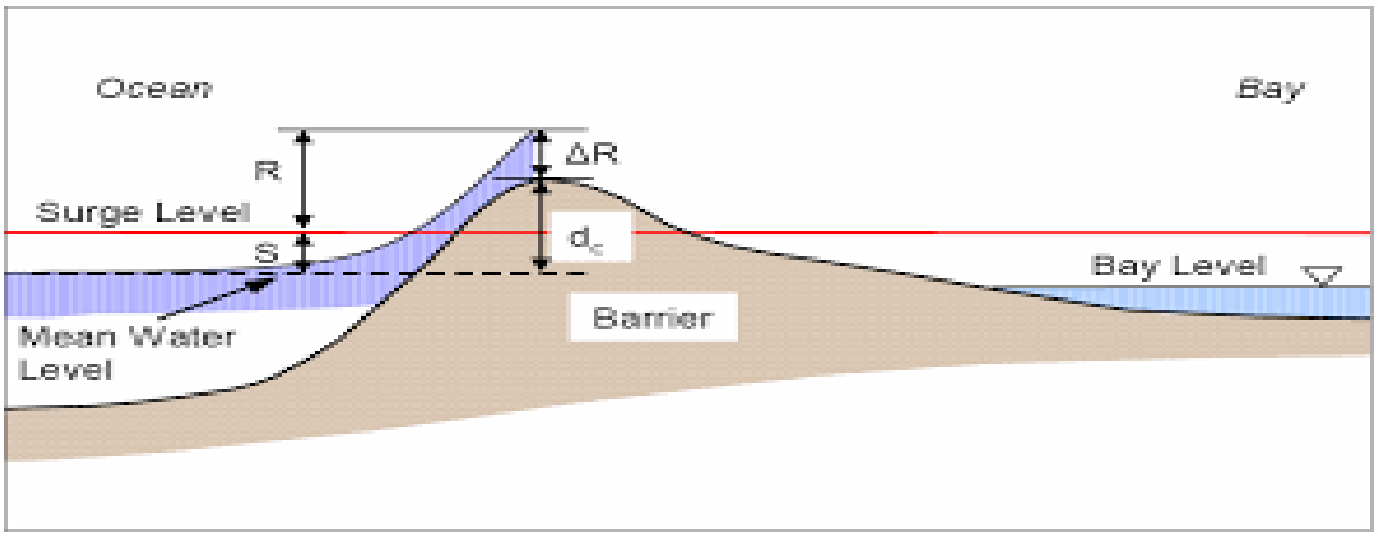


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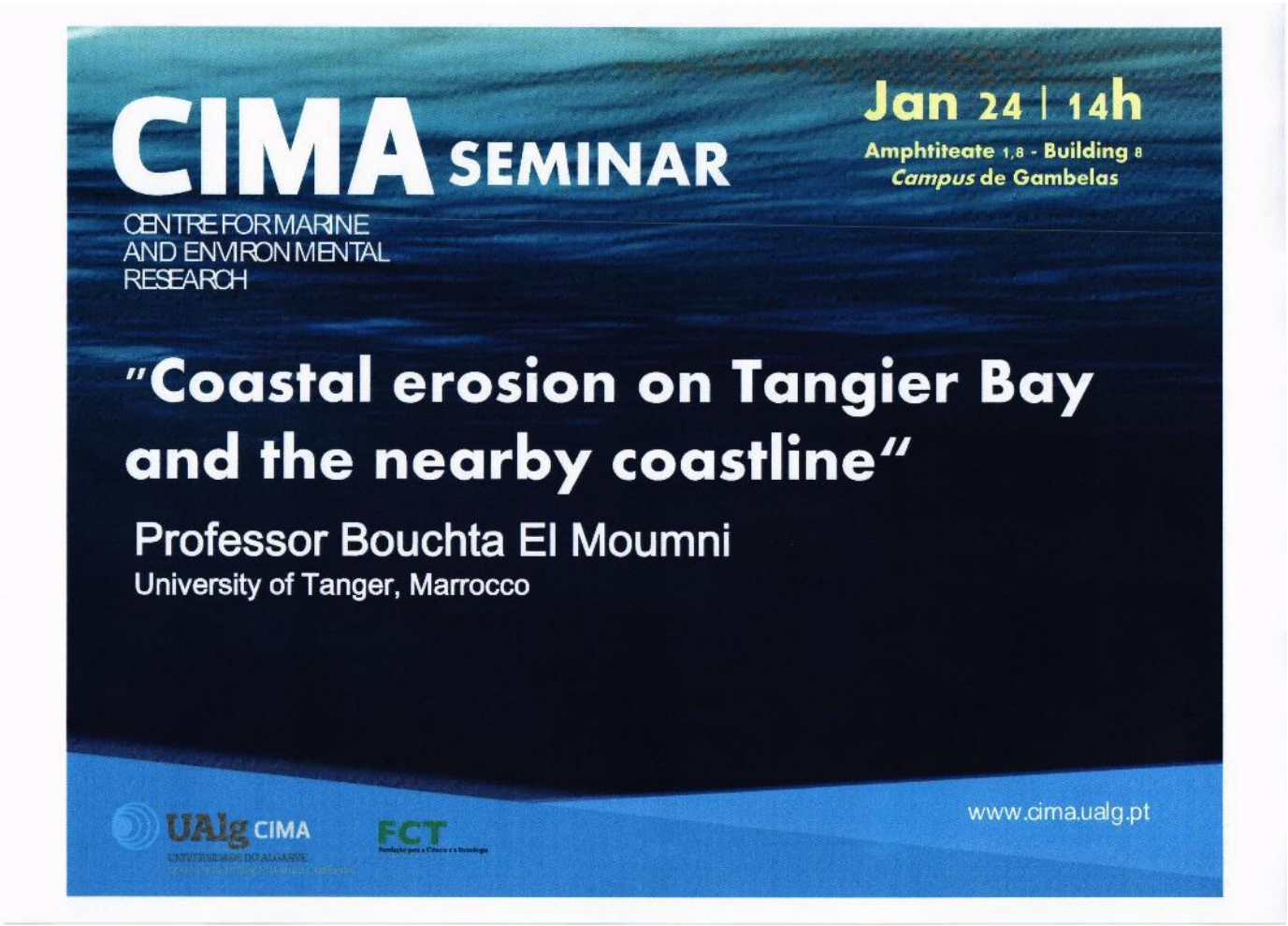
Photo gallery

My interventions at the seminar held January 24, 2018 at the Faculty of Science and Technology - University of Algarve. Interventions of other colleagues from the University



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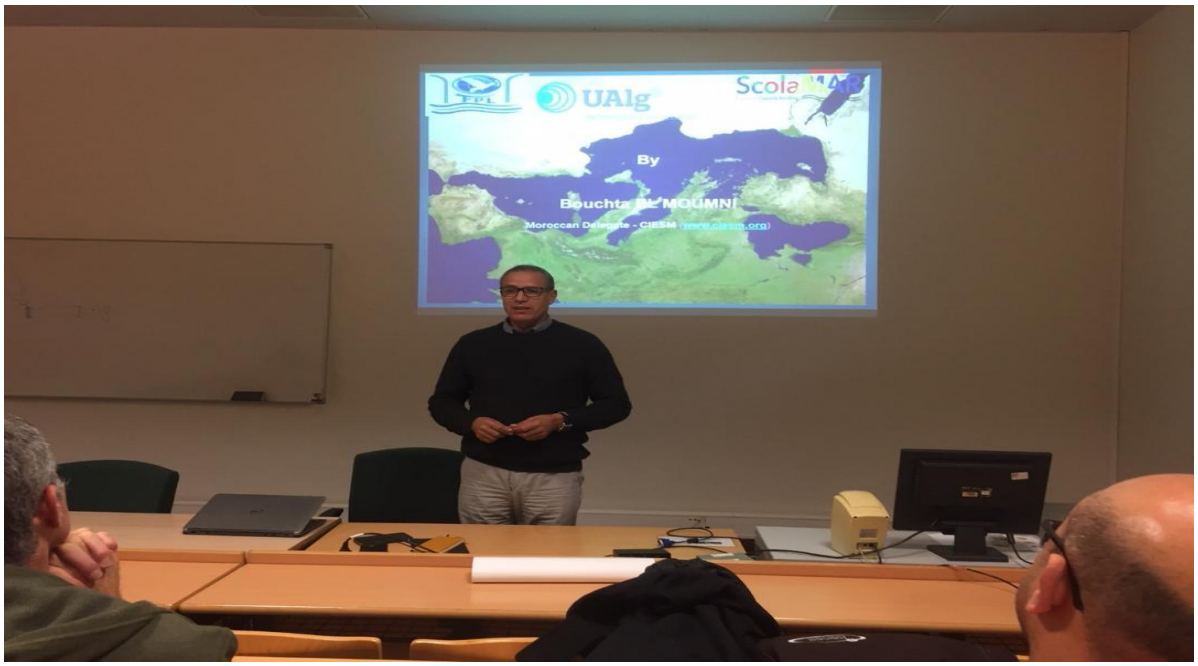

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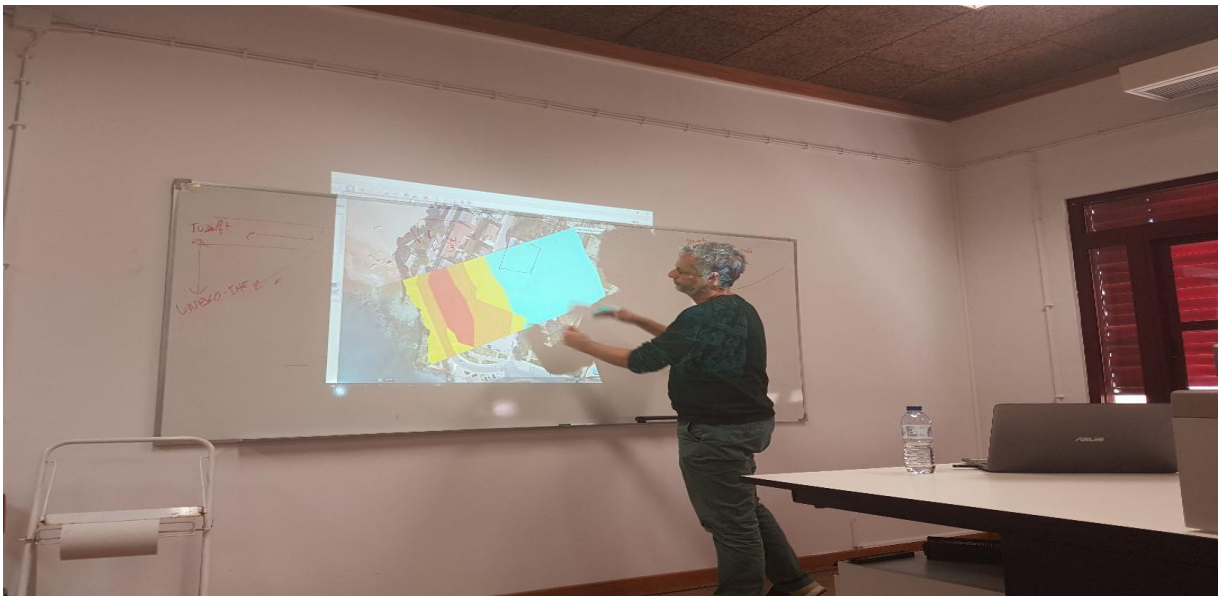
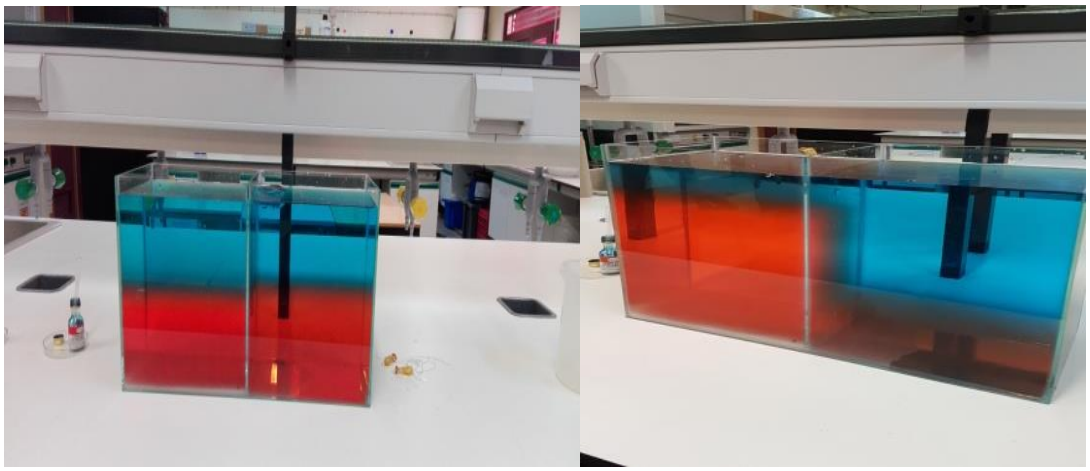


Example of an experiment to show the thermo-hyaline circulation to students: Examle of Gibraltar Street



Application and Pictures taken during field trips

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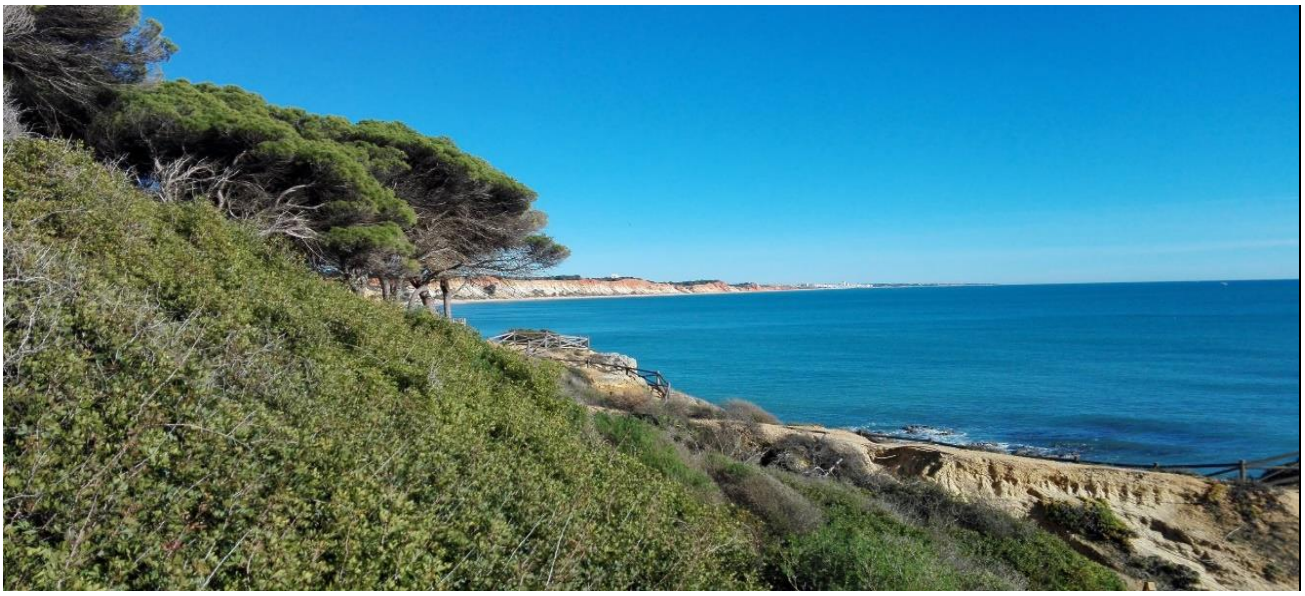
Coastal erosion



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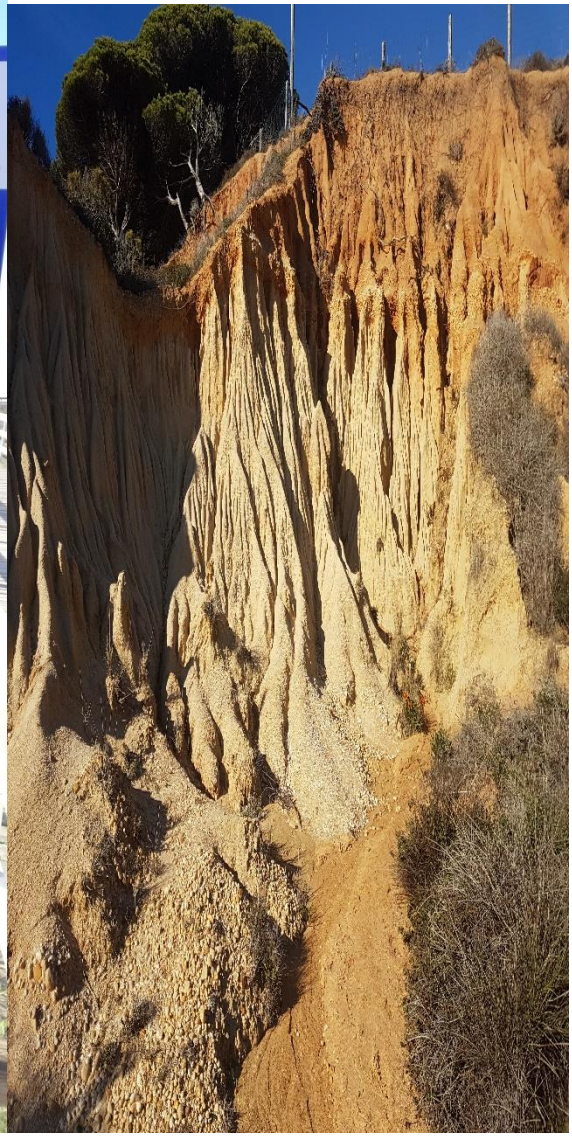

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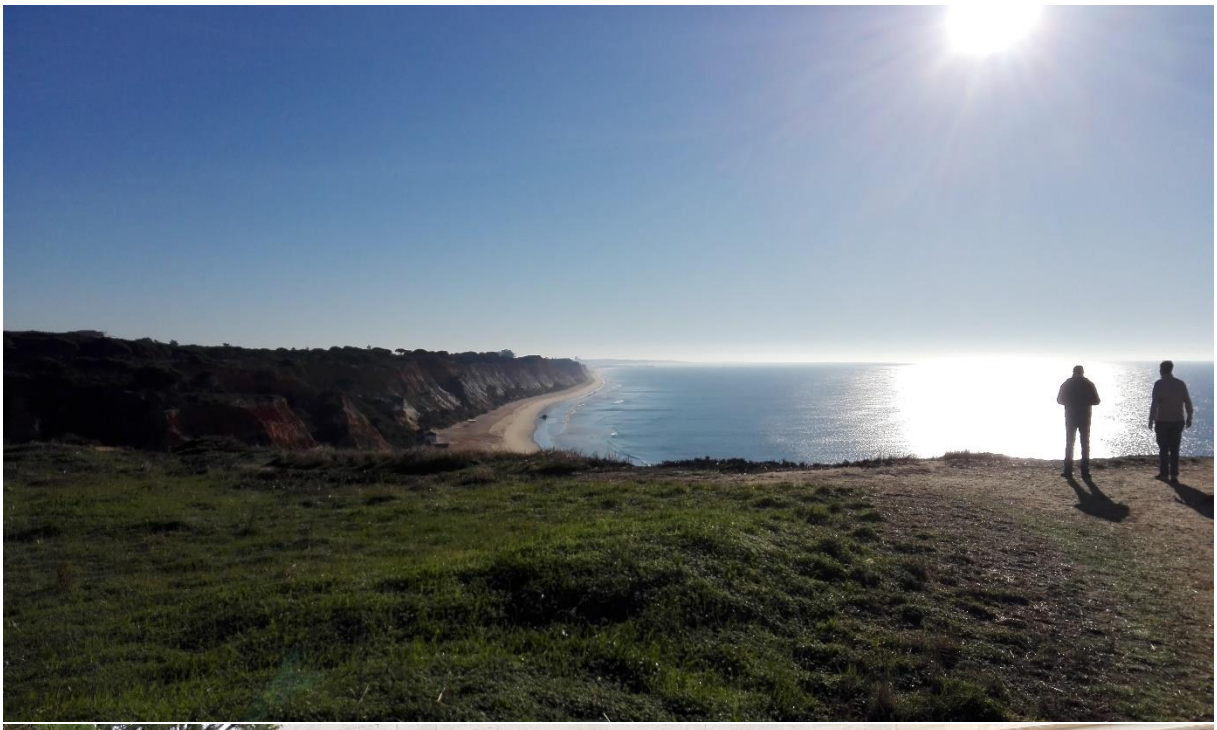

END of our Stay

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	COASTAL POLLUION
Thematic(s)	MARINE SCIENCE
Type of module *(Select one or more boxes)*	☒ Lecture course ☐ Tutorial exercice ☒ Practical exercice ☐ Group workshop ☒ Field trip ☐ Other – precise:

Teaching manager	BOUCHTA EL MOUMNI
Speakers)	KHALID CHAFIK, PROF. IN THE FST-TANGIER

Year / Semester	
Number of hours	60
Number of groups	2 GROUPS

Objectives	- To deepen the knowledge of the winners in the environment of littoral and marine environment - Learn different approaches and tools for fighting coastal pollution - How to preserve densely populated places: harbors, marinas, tourist resorts, etc.
Content	The content of this module takes into consideration what is done in the 4 Moroccan universities of the consortium plus a summary of the pedagogical approach used in the European countries involved in ScolaMar
Teaching methods	Focus on the participative method where students participate in classes, organize presentations and workshops, visit the field (harbors, marinas, beaches, sea trips ...) Learn the best approaches and procedures from the beginning, analyzes to the interpretation of the results and the proposal of solutions and recommendations.
Knowledge required	Knowledge in chemistry, biology / geology. Knowledge in statistics and English is desired
Skills required	licenses in biology, geology, chemistry and environment
Equipment required	atomic absorption, X-ray diffractometry, sampling tools at sea, organic carbon dosing apparatus, BOD, COD, measurement station in situ physicochemical parameters
Type of evaluation *(Select one or more boxes)*	☒ Oral – precise: individual oral test to better assess students' knowledge ☒ Written – precise: 4-hour written exam at the end of the semester ☒ Other – precise: note on the collective work: field trip, visit, internship, presentation, workshops etc.
Comments on evaluations *(Precisions on criteria)*	The evaluation criteria will be based on a score out of 20, taking into account the written, oral, internship and visits. The coefficients will be defined in agreement with the entire teaching staff participating in the Master.

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[01/15/2018]** till **[01/26/2018]**
Duration (days) – excluding travel days: 12

The Staff Member

Last name (s)	El M'rini	First name (s)	Abdelmounim
Nationality	Moroccan	AcademicYear	2017 - 2018
Position	Associate Professor		
E-mail address	aelmrini@gmail.com		

The sending university

Name	Abdelmalek Essaadi University
Faculty/Department	Faculty of Sciences of Tetouan / Department of Geology
Address	Quartier M'hannech II, avenue Palestine - B.P. 2117 Tétouan
Country	Morocco

Contact person

First/Last name(s)	Bouchta El Moumni
Position	Professor

The receiving university

Name	University of Algarve
Faculty/Department	Faculty of Sciences and Technology
Address	Campus of Gambelas, Building 7, 8005-139 Faro
Country	Portugal

Contact person

First/Last name(s)	Adelino Vicente Mendonça Canário
Position	Professor

Type of mobility

☐Technical skills
✓ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The main objective of this mobility is the capacity building in the field of Higher Education of professors from Moroccan universities members of the ScolaMAR project to face the societal challenges of coastal zone management.

In the short and medium term, it sets the objective training of the trainers of the Moroccan staff who will be involved in teaching of the future Master ScolaMAR program. My project's module for this master is entitled ''Coastal and Marine Hazards'', and University of Algarve has a great experience in this subject. Indeed, (*Centro de Investigação Marinha e Ambiental (CIMA), Universidade do Algarve*) offers an International Master's degree course entitled ''Marine and Coastal Systems'' and among the modules taught in the 3rd Semester there is " Coastal and Marine Hazards ". Thus, this mobility allowed me to exchange with the Staff of this Master in general, and in particular, with three professors intervening in the teaching of the aforementioned module.

These skills will enable me to promote innovation in pedagogical approaches in my university as well as to transfer knowledge from the experiences *''Centro de Investigação Marinha e Ambiental''* for the current ScolaMAR project.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	15/01/2018	-The coordinator of the ScolaMAR Project for the University of Algarve Mr. Adelino Vicente Mendonça Canário accompanied us from the Hotel to the Faculty of Science and Technology and put us in contact with the staff who will accompany us during the Job shadowing. -Then we had a discussion with Pr. **Delminda** Maria de Jesus **Moura** about the proposed ScolaMAR Master's project, student profile, pedagogical approaches, etc. -Pr. Bouchta El Moumni recounted the history of the idea and the start of this project. - Pr. Delminda Moura showed us around the faculty and we met colleagues and discussed possibilities for future collaboration. - At the end of this first day, Professor Moura presented her course on coastal morphodynamics.

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2	16/01/2018	Field trip with Professor Moura on the rocky coasts of Algarve to discuss the morphodynamics of this particular type of coast and pocket beaches. We made three stops: 1: Baia Grande; 2: Galé; 3: Praia Maria Luisa.
3	17/01/2018	-Professor Moura explained to us some geological aspects of the Lagos region, and how they control the geomorphology of the coast. - Examples of exercises on marine morphodynamics.
4	18/01/2018	-Professor **Óscar** Manuel Fernandes Cerveira **Ferreira** told us about their experience of Master " Marine and Coastal Systems ". It is an International Master, 70% of the students are foreigners and 35% are from outside Europe (2017-2018). This Master presents the applied side and the field work as strengths. Then we had a discussion on the problem of beach erosion in Portugal and the cost of beach nourishment. - Discussion of methods developed at RiscKit (namely the CRAF).
5	19/01/2018	- Morning (Pr. Oscar Ferreira): Field visit to Praia de Faro to see some aspects of coastal hazards (erosion and submersion), historical and future interventions, conflicting uses, beach nourishment, management ... - Exercises on setback lines (erosion and sea level rise).
6	22/01/2018	Exercises on overwash and risk cartography with Pr. Oscar Ferreira.
7	23/01/2018	-Field visit with Pr. Oscar Ferreira to the sandy coast between Vilamoura and Vale do Lobo. Human interventions and coastal management issues. -Afternoon with Professor **Joaquim** Manuel Freire **Luís**: • Presentation of principles of tsunami generation and propagation. • Example of running a short simulation.
8	24/01/2018	-Morning (Prof. Joaquim Luis): Grid creations. The concept of nesting grids and how to compute them. -Afternoon: Pr. Bouchta El Moumni and I have presented research in the framework of a seminar organized on the occasion of our visit to the University of Algarve. The presentation was followed by fruitful discussions especially on the possibilities of future collaborations.
9	25/01/2018	Professor Joaquim Luis: Running a simulation at high resolution with inundation.
10	26/01/2018	Last meeting with the staff who ensured our job shadowing, group photo and goodbye.
Finally, I would like to thank the coordinators of ScolaMAR Project for giving me this opportunity which allowed me to complete my teaching skills and open up to other experiences. I express my sincere feelings of gratitude to the staff who accompanied and guided me during these two weeks which were unforgettable; thanks, Delminda, Oscar and Joaquim with my sincere friendships.		

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

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Being shadowed during these two weeks by a staff who has a great experience in the teaching of marine and coastal systems, this mobility allowed me to open more on the practical aspects (field work, laboratory and computer-assisted work) in the teaching of coastal morphodynamics and marine and coastal hazards. I will take this experience into consideration when developing my project module in the ScolaMAR project, and at every opportunity I will transfer this learning to my university students.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Technical and pedagogical competences I acquired during my job shadowing will be an added value to my teaching skills. I will share this experience by sending a report to our institution in order to integrate them into pedagogical programs. on the other hand, I will share this experience with my colleagues from the Department of Geology at the Faculty of Science of Tetouan, through internal meetings and seminars, and with students of our Master (environmental geosciences) in our department in which I teach the Module ‘’Integrated Coastal Zone Management’’.

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ANNEXES

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MaCS MASTER

MARINE AND COASTAL SYSTEMS MASTER PROGRAMME (MACS - SIMCO)

TEACHING METHODS

- Taught modules, core and optional research training modules
- Field work and field visits (more than 50h) and use of field equipment
- Laboratory work (more than 200h) and use of extensive laboratory facilities and equipment
- Science communication in seminars
- Scientific diving (optional)

DURATION OF THE STUDY PROGRAM:

2 years (4 semesters), 120 ECTS, full time

1st Semester

- Large Scale Ocean Processes
- Geology and Geophysics of Ocean Basins
- Marine Morphodynamics
- Marine Trophic Dynamics
- Anthropic Disturbances of Marine Systems
- Monitoring of Marine Systems

CLICK HERE FOR MORE INFORMATION >

2nd Semester

- Coastal Oceanography
- Remote sensing and marine cartography
- Modelling of Marine Systems
- Oceanographic Data Analysis
- Option I – Oceanographic Research Cruise
- Option II – Fundamentals of Scientific Diving in Oceanology (Optional)

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CONTACTS

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FCT Masters:

fctmestrados@ualg.pt

Webpages:

http://www.macsmaster.com

http://www.ualg.pt/home/pt/curso/1740

3rd Semester

- Eutrophication and Harmful Algal Blooms
- Isotopic Tracers of Marine Processes
- Coastal and Marine Hazards
- Records and Measures of Environmental Changes
- Basin Analysis
- Dissertation Plan – Seminar

CLICK HERE FOR MORE INFORMATION >

4th Semester

- Dissertation

CLICK HERE FOR MORE INFORMATION >

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Erasmus+ Capacity building

The Centre for Marine and Environmental Research (CIMA) was created in 1998 and is a leading multidisciplinary Research Unit at the University of Algarve (UAlg). CIMA's mission is to promote scientific knowledge and innovation in environmental areas, with special focus on the marine and coastal realms.

CIMA's goal is to ensure sustainable, integrated and smart development in agreement with the EU priority investigation themes for 2020, related to "Climatic action, sustainable ecosystems and environmental resources".

TRANSITIONAL WATERS

ESTUARIES AND LAGOONS

Observations, hydrodynamics, ecology, quality, currents, nutrients concentration, exchange with ocean, upwelling, management.

COAST

COASTAL PROCESSES AND RISKS

Coastal barrier dynamics, risk assessment, waves, erosion, retreat, dunes, management, risk reduction, resilience overwash, inlet dynamics.

ENVIRONMENTAL QUALITY AND REMEDIATION

Water quality assessment, surface water bodies, groundwater, soils, pollution, environmental risk, ecotoxicology, microplastics bioremediation, food quality human health.

ENERGY AND RESOURCES

Renewable energies, biofuels, biorefinary, sustainability marine energy.
Aeolian energy, deep sea mineral resources.

CLIMATE VARIABILITY

PAST, PRESENT AND FUTURE

Paleoenvironments, climate proxies, continental shelf, sea-level rise, aeolian activity, stalagmites, phytoplankton, primary production adaptation strategies.

OCEANS

OCEAN OBSERVATION

Ocean surface circulation and productivity, operational oceanography, remote sensing, modeling, downscaling, chemical and physical oceanography, microbiology, deep-sea resources exploitation, deep-sea ecotoxicology

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Examples of exercises:

Marine Morphodynamic
Exercises on sediment transport

Objective: to understand why knowledge on sediment transport is important

1- The artificial nourishment of a given beach is frequently the only way to keep sand there. However, the successful of that action depends on the knowledge of the morpho-hydro-sedimentary processes. The future stability of the nourished beaches relates directly to grain size. Additionally, the knowledge on cross and alongshore transport is of fundamental importance.

1.1- Explain why the successful of the artificial nourishment of beaches is dependent , among other variables, on the sediment´s grain size.

1.2- Observe Figure 1 and write a sentence which synthetises the relationship between beach slope and grain size.

1.3- Witch is the mean grain size on beaches steeper than 10°?

1.4- Based on Figure 1, write an empirical formula, relating the beach slope and the grain size

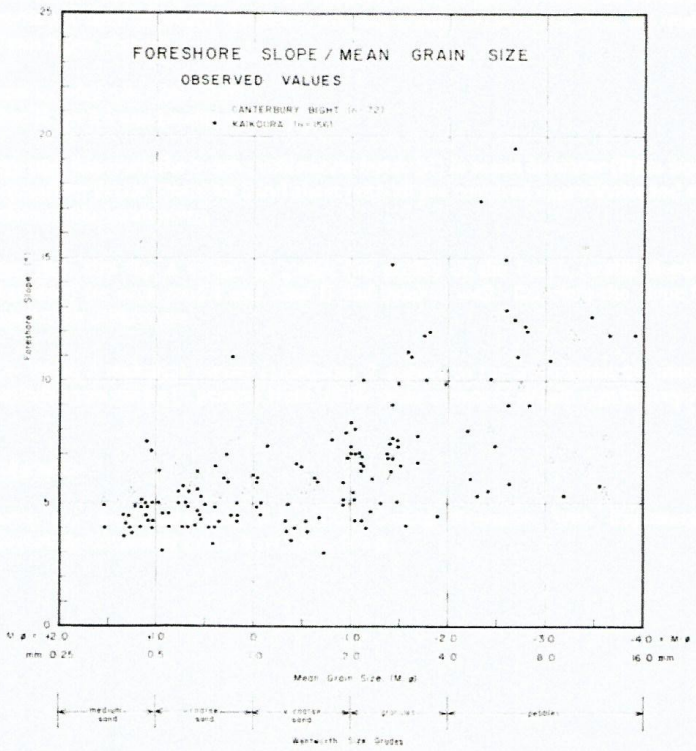

Figure 1- Observed relationships between gran size and beach slope in Kaikoura beach, after Mclean and Kirk, 1969

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Marine Morphodynamic
Exercises on sediment transport

2- The relationship between mean grain size and beach slope at a given depth of the water column in the nearshore may be easily calculated using the follow expression (Dean & Dalrymple, 2002):

$h = Ay^{2/3}$ (1) Where, **h** is the depth of the water at **y** distance seaward from the shoreline and **A** is a *profile scale factor.*

The relationship between **A** and the settling rate of the sediment (**w**) is nearly linear:

$A = 0{,}067\, w^{0.44}$ (2)

and, $w = 14\, D^{1.1}$ (3) where, **D** is the mean diameter

---

2.1- Explain the relationship between the sediment settling rate and the grain size.
2.2- You are a consultant of an environmental management agency and you are asked for technical advice concerning a beach nourishment. After several storminess winters that beach, lost sand and became imbalanced. Thus, its is necessary to feed artificially the beach. The local sand in the nearshore has a mean diameter of 0,12 mm. In order to restore the equilibrium profile and thus the beach resilience, you may dredge to the beach, from the nearby sea floor, one of two types of sand:

Sand I: D=0,2 mm (fine sand)
Sand II: D= 0,5 mm (medium sand)

Step one: Calculate the beach profile scale factor (**A**) to mean diameter (**D**) to sands I, II and local Suggestion: firstly create an Excel sheet with all the required expressions and than calculate the values of the parameters.

Step two: Use the **A** values to graph the profile of the beach (water depth vs. distance to shoreline) for both sand I and sand II and local as well. Calculate the slope for all situations. Explain the differences.

2.3- Write a technical report (maximum 2 pages) to the environmental management agency, justifying you choice (5 points). Note: all the team members should sign the report.

Reference

Dean, R.G. and Dalrymple, R.A., 2002. Coastal Processes with Engineering Applications, Cambridge University Press, New York, 474 p.

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Marine Morphodynamics
Exercises on sediment transport

Objective: to propose environmental remediation solutions

Rationale

The alongshore transport is the balance between sediment supply and sediment sink and, negative and positive transport (see figure 1)

$Q_{net} = Q1 + Q2$
$Q_{gross} = |Q1| + |Q2|$

Q- solid transport thousands cubic meter per year
Q1 (positive value) Transport along the main direction of the waves approaching the coast or favouring the beach fill (supply)
Q2 (negative value) Transport opposite to the main direction of the waves approaching the coast or sediment sink

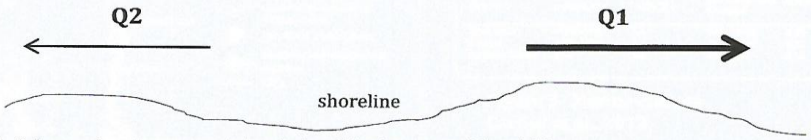

Figure 1- Schema showing geometric relationships between Q1 and Q2

Sediment budget

$\Sigma Q_{source} - \Sigma Q_{sink} - \Delta V + P - R = Residual$

If residual is zero, the littoral cell is in equilibrium

P = beach fill, dredged placement
R = dredging, mining
ΔV = Beach erosion/accretion

Exercise 1- The northern France near Dunkirk characterizes by extensive estuarine areas of high ecological value (Figure 2). However, those areas are in risk of being invaded by marine sands. Additionally, the 300 to 800 m wide beaches are gentle sloping. The presence of several sand banks on the shore-face and inner shelf dissipate large amount of the waves energy. Tidal regime is a macrotidal (6 to 10 m of tidal range; see figure 3 for details).
Note: Exercise 1 is based in a case study by Cartier et al., 2013.

1.1- **Why** the inner-shelf and shore-face of the northern of France characterizes by such amount of sand banks (Figures 2 and 3)?

1.2- The alongshore sediment transport ranged between 1×10^{-4}. $Kg.s^{-1}.m^{-1}$ associated mainly to waves showing Hs< 0.3 m and 1×10^{-3}. $Kg.s^{-1}.m^{-1}$ for higher waves. However, higher volumes of sediment transport were also observed in relation with waves of Hs=0,2 m.
The measured mean flow velocity of 0.5 $m.s^{-1}$. These values are similar to the ones obtained on micro and meso tidal regimes and other macro tidal beaches as well.

What do you conclude based on the above exposed and on figure 4? **In your opinion** what is the first order environmental variable controlling the alongshore transport?

1.3- **Criticize** the experimental design showed in Figure 5. **Propose** another one aiming the same goal.

1.4- **What solution** you propose in order to avoid the complete silting of the estuaries in the zone?

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Marine Morphodynamics
Exercises on sediment transport

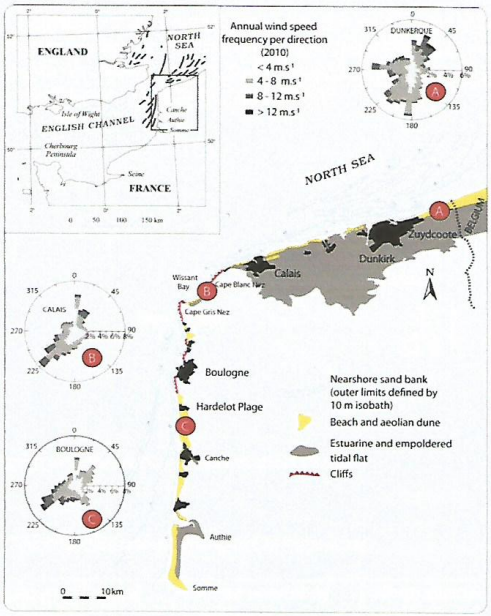
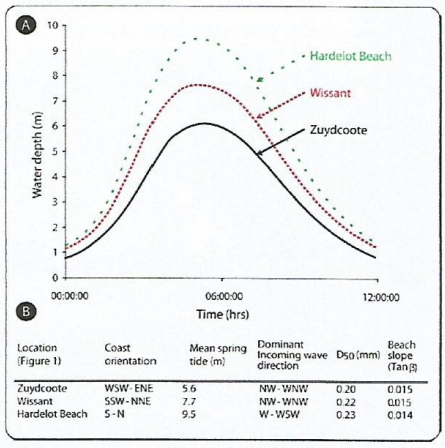


Figure 2- Coast of northern of France (Cartier et al., 2013)



Location (Figure 1)	Coast orientation	Mean spring tide (m)	Dominant incoming wave direction	D50 (mm)	Beach slope (Tanβ)
Zuydcoote	WSW - ENE	5.6	NW - WNW	0.20	0.015
Wissant	SSW - NNE	7.7	NW - WNW	0.22	0.015
Hardelot Beach	S - N	9.5	W - WSW	0.23	0.014

Figure 3- Marine climate Cartier et al., 2013

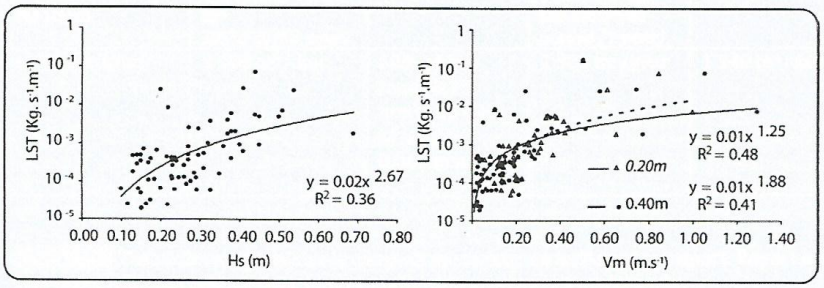


Figure 4- Relationship between alongshore transport (LST) and marine climate (Cartier et al., 2013)

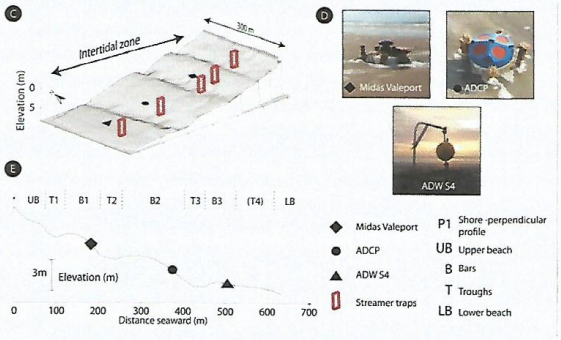


Figure 5: experimental design (Cartier et al., 2013)

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Marine Morphodynamics
Exercises on sediment transport

Exercise 2- It is of utmost urgency to provide protection to a coastal town (Fig. 6), which is being destroyed by waves every year. The government believe that the solution lies in building groins. Table 1 resumes the field data acquisition along one year. **Which solution** your consulting firm will advise to the government? **Why**?

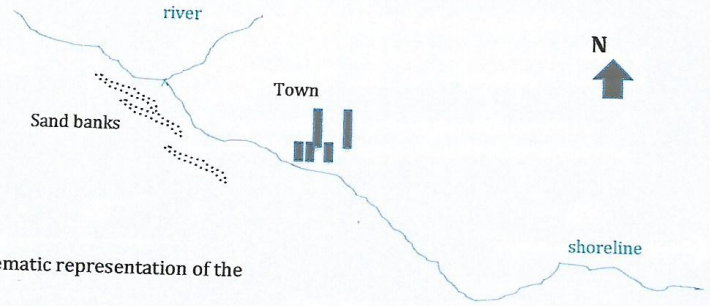

Figure 6- schematic representation of the

Table 1- Sediment transport information

Mean volume of sediment transported when waves approached from SW (70 % of the year)	***Mean volume of sediment transported when waves approached from SE (25% of the year)***	***Mean diameter of the fluvial particles***	***Total volume of sediment transported by the river to the beach during the observed period (1 year)***	***Volume of sediment transported to sand banks in the lower shoreface***
6 4000 m^3/day	2 300 m^3/day	60% of fine sand (0,20 mm) and 40% of mud (< 0,063 mm)	1 900 m^3/year	1 140 m^3/day

Exercise 3- The sediment grain size is a key-characteristic on sediment transport. Report other two properties you believe to be important for this process and explain why.

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Exercises on morphosedimentary characterization of the continental shelf

Objectives:

(i) to interpret hydrographical maps; (ii) to identify the inner and outer limit of the continental shelf, (iii) to quantify the width, slope, and depth of the continental shelf, (iv) to identify and characterize the main morphological aspects of the continental shelf.

Methodology:

a) This work is to be carried out in 3 students- groups.
b) Each group will study a continental shelf sector.
c) It is expected that this exercise will be extended by two practical classes, as follow: 1st class and 1/3 of the 2nd one: each group works independently; 2/3 of the 2nd class: each group transmit their knowledge to the entire class. At the end, conclusions shall be drawn.

1- Read carefully all the information on the hydrographical map on which you are going to work.

2- Identify the outer edge of the continental shelf. What criteria did you use for this? At what water-depth is located?

3- Identify the inner boundary of the shelf and characterize it for the physiography and orientation. What relationship do you find between the orientation of the outer edge of the shelf and the coastline?

4- Can you individualize the continental slope and continental rise on the map you're working on? If so, what criteria did you use?

5- What is the average width of the continental shelf sector you are studying? and the average slope? if there are very large differences, divide the area into sub-sectors and characterize them individually.

6- Identify particular morphological aspects in the sector of the shelf you are studying (e.g., canyons, islands, depressions). Characterize them for orientation, shape, dimensions and depth.

7- Is there a hydrographical network that drains to the coast? What is the influence on the shelf morphology?

8- Are there any morphological or sedimentary features that are not in balance with the current environmental conditions? Which are? How do you justify their occurrence?

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Marine and Coastal Sistems
Marine Morphodynamic- Exercises P4

Objectives: (i) Schedule a field campaign which goal is to calculate the depth of mix, in what concerns (i) required information to program the field work, (ii) the data that is necessary to acquire, (iii) required material to acquired the wanted data, (iv) number of teams and people/team and (v) methodology; (ii) Quantify the active layer; (iii) characterize the geomorphic state of a beach.

Rationale

Beaches behaviour is of fundamental interest on coastal evolution as well as of practical importance. Beach nourishment is a viable engineering alternative for shore protection and an important technique for beach restoration, requiring the knowledge on dynamic processes and displaced sand volumes over several spatial and temporal scales.

Waves breaking oblique to the coast generate alongshore currents in the surf zone that flow parallel to the shore capable of transporting large amount of sediment (alongshore drift). When waves approach the coast, the percentage of breaking waves and the ratio of significant wave height to the water depth (H/h) increases toward the shoreline and breaking of individual waves occurs gradually with the larger ones breaking first distant from the coast and the smaller ones breaking near the shoreline.

The surf zone width depends on the slope of the shoreface and type of breakers and, in turn, the shore face slope is dependent of the grain size.

The importance of knowing the sediment transport rate is well expressed by the numerous attempts to access it both through direct measurements in the field and numerical models.

The amount of the transported sediment in a given time interval should be assessed two-dimensionally. Thus, in addition to know the distance travelled by the sediment, it is also necessary to assess the depth of the layer where occur active exchanges of sediment: depth of mix. The determination of the active layer is also fundamental to evaluate the amount of micro-plastics or other contaminants in the system.

Exercise 1

Read carefully the rationale that introduces the exercises and identify the variables required to calculate the depth of mixture (active layer) and further the alongshore transport rate. Fill the table 1.

Table 1- Environmental variables accounting for the sediment transport rate in a sandy beach

Wave parameters	Beach parameters	Sediment parameters	Other parameters you think are important

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Exercise 2

You are applying for funds to develop a scientific research on sediment transport, with links to coastal management and engineering solutions on coastal remediation. All projects should include a detailed work-plan. Discuss with your colleagues and point an expedite methodology easy to perform in the field to assess the depth of mixture:

Schedule a fieldwork campaign to assess the depth of mixture, follow the steps:

1º) Previous information required;

2º) Which is necessary to observe and measure? Which data you need? How do you intent do measure? Which material is necessary? Fill the table 2.

Table 2- Work-plan; schedule of fieldwork to access the depth of mixture

TASKS	MATERIAL	PEOPLE (team)	OTHER

Exercise 3

Figure 1 represents the behaviour of a beach along three profiles in in two consecutive days. Table 2, resumes the field data of waves and wind.

Calculate the layer mixture depth using the follow empirical formulae:

$Z_m = 0.027\ H_b$ (Kraus, 1985)

$Z_m = 0.27\ H_b$ (Ciavola et al., 1997)

$Z_m = 1.86\ H_b \tan \beta$ (Ferreira et al., 2000)

Where, Z_m = layer mixture depth; H_b is the waves' height at the breaking point; β ⓘ? the beach-face slope.

Compare the values between the used formulae. Which formula you believe is the more suitable to estimate the depth of mixture? Justify you answer.

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Exercise 4

Based on table 2, estimate the geomorphic state of the beach using the surf scaling parameter (ε) after Guza and Inman (1975)

$$\varepsilon = \frac{2\pi^2 H_b}{gT^2 tan^2 \beta}$$

Where Hb is the wave height at the breaking point, T is the waves period and β is the beach slope. π is the pi number (3.14) and g the gravity acceleration (9,8 m/s).
The beach is reflective is $\varepsilon < 1$ and dissipative if $\varepsilon > 30$. In between is of intermediate state.

Table 2- field data. Onshore wave height is breaking height (Hb)

Wave climate						Wind			
Wave height		Wave period		Wave direction					
Offsore data	onshore	Offsore data	onshore	Offsore data	onshore	wind direction	Wind force	Beach slope	
Hs = 0,33 m	0,43 m (11 observations	T m= 4,4 s	5 s	WSW	220º	NNE	2,1 m/s	3,78°	Profile 1
Hm= 0,53	0,25 m (6 observations)	Tmax= 11,7 s	10 s		220	NW	4,65 m/s	4,4°	Profile 2
	0,26 m (21 observations)		15,7 s		SW	NW	4,65 m/s	4,0°	Profile 3

Exercise 5

Use table 2 to answer:

a) The offshore wave direction is in phase with the wind in the coast? Why?
b) Justify the observed differences between the offshore and onshore Hs
c) The relationship between the wind velocity (V) and the wave height (H) is expressed by the formulae (1). Is the wind velocity in accordance to the wave height?

$$H = 0{,}031\ V^2$$

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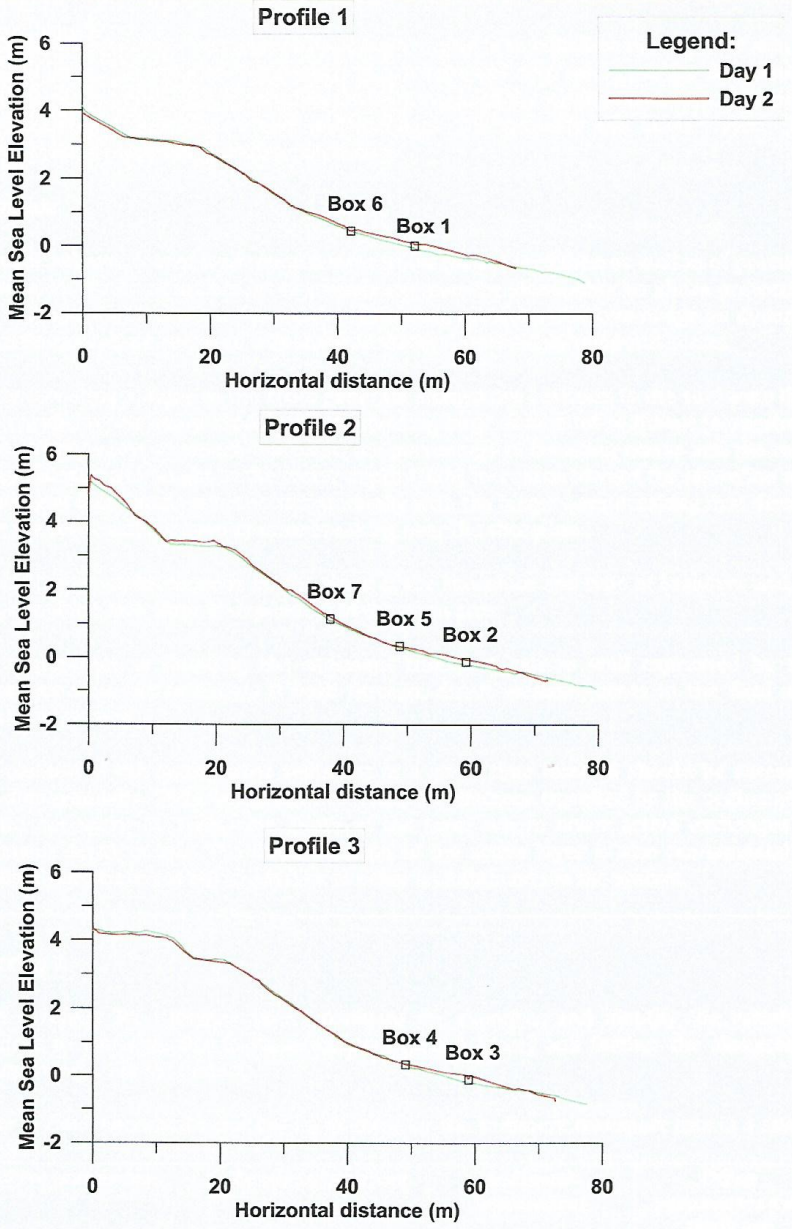

Figure 1- Beach profiles in two consecutive days

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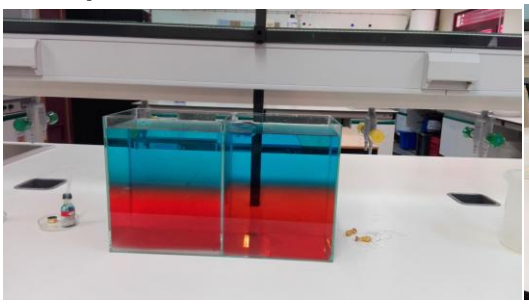
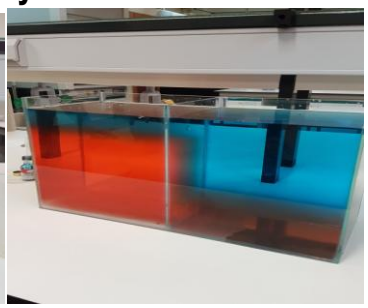
Photo gallery

Our interventions me and Mr. El Moumni at the seminar held January 24, 2018 at the Faculty of Science and Technology - University of Algarve

Example of an experiment to show the thermo-hyaline circulation to students

Pictures taken during field trips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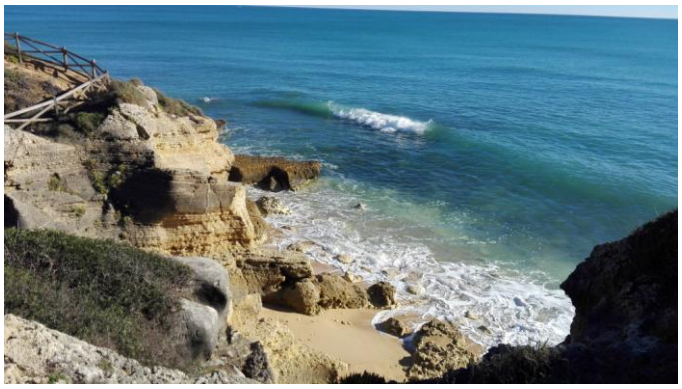

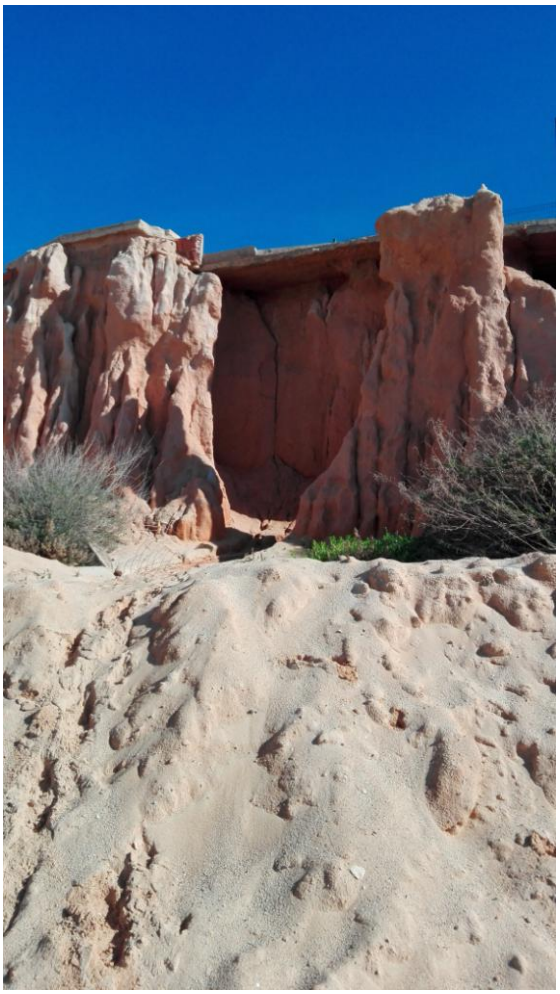

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PEDAGOGICALTOOL-KIT
Teaching module

Module title	**COASTAL AND MARINE HAZARDS**
Thematic(s)	STUDY OF COASTAL HAZARDS (EROSION AND SUBMERSION) ADOPTING A SYSTEMIC APPROACH OF THE COAST AND CONSIDERING INTEGRATED COASTAL ZONE MANAGEMENTS (ICZM) ISSUES; THIS MODULE WILL PROVIDE THE FUNDAMENTAL KNOWLEDGE NECESSARY FOR FORECASTING, ASSESSING AND MANAGING COASTAL HAZARDS.
Type of module *(Select one or more boxes)*	✓ Lecture course ✓ Tutorial exercice ✓ Practical exercice ✓ Group workshop ✓ Field trip ☐ Other – precise:

Teaching manager	ABDELMOUNIM EL M'RINI
Speakers *(Precise if external speakers)*	

Year / Semester	3RD SEMESTER
Number of hours	50
Number of groups	1

Objectives	AFTER SUCCESSFUL COMPLETION OF THIS MODULE STUDENTS ARE EXPECTED TO BE ABLE TO: • IDENTIFY THE PROCESSES INVOLVED IN THE GENERATION OF DIFFERENT TYPES OF MARINE AND COASTAL HAZARDS; • IDENTIFY THE RESPONSE OF DIFFERENT TYPES OF COAST FACING THESE HIGH-ENERGY EVENTS; • BE ABLE TO PROPOSE MEASURES TO MITIGATE THE IMPACT OF THESE EVENTS BY TAKING AN INTEGRATED APPROACH.

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Content	**SPECIFICITIES AND CHALLENGES OF THE COASTAL ZONE:** • DEFINITION OF COASTAL SYSTEMS AND DIFFERENT TYPES OF COASTS; • COASTAL SUBSYSTEMS AND SCALE INTERLOCKING; • CONCENTRATION OF POPULATIONS, USES AND ACTIVITIES ON THE COASTAL ZONE; **EROSION AND SUBMERSION IN COASTAL AREAS:** • MORPHODYNAMIC BEHAVIOR OF THE COASTAL ZONE; • NATURAL FORCINGS (WINDS, WAVES, TIDES, CURRENTS, SEA LEVEL VARIATIONS); • ANTHROPIC FORCINGS (FACILITIES, EXTRACTION OF MATERIALS, DISRUPTION OF FLOWS, ETC.); • DEFENSE AGAINST COASTAL EROSION AND SUBMERSION **QUANTIFICATION AND MAPPING OF THE ISSUES (HUMAN, ECONOMIC OR ENVIRONMENTAL VALUE OF THE ELEMENTS EXPOSED TO THE HAZARD).**
Teaching methods	LECTURES, WORKSHOPS, SEMINARS, FIELD AND LABORATORY EXERCISES, MINOR PROJECTS PRESENTATION.
Knowledge required	STUDENTS IN THE FIELDS OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT: GEOGRAPHY, GEOLOGY, DEVELOPMENT.
Skills required	BE ABLE TO COMBINE THEORETICAL KNOWLEDGE AND FIELD MEASUREMENTS AND OBSERVATIONS TO PROPOSE SOLUTIONS FOR A COASTAL HAZARD ISSUE.
Equipment required	COMPUTERS AND SOFTWARE FOR PRACTICAL EXERCISES.
Type of evaluation *(Select one or more boxes)*	✓ Oral ✓ Written ✓ Other: minor projects, reports and presentations

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **04/11/2018** till **17/11/2018**
Duration (days) – excluding travel days: 12 days

The Staff Member

Last name (s)	WAHBI	First name (s)	Miriam
Nationality	Moroccan	AcademicYear	2017 - 2018
Position	Lecturer		
E-mail address	wahbi.fstt@gmail.com		

The sending university

Name	AbdelmalekEssaâdi University
Faculty/Department	Faculty of Science and Technology of Tangier
Address	Ancienne route de l'aéroport, Km 10, Ziaten. BP. 416 Tangier.
Country	Morocco

Contact person

First/Last name(s)	Mohammed ADDOU
Position	Dean of the faculty.

The receiving university

Name	University ALGARVE
Faculty/Department	CIMA - Centre for Marine and Environmental Research
Address	University of Algarve, Edifício 7, Campus Universitário de 139, Faro,
Country	Portugal (Faro).

Contact person

First/Last name(s)	Adelino Vicente Mendonça Canário
Position	UAlg ScolaMAR coordinator

Type of mobility

☒Technical skills
☒Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The main objective of my mission is to see the applications of geomatics in the field of coastal risks. But on the other hand, to attend new pedagogical news transmission of knowledge in the context of a Masters in general and in the field of natural hazards in particular.
See how researchers come together around a pedagogical project by using the results of their research in their illustrations and teaching.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons,meetings, trainings, conferences, field trips)

Day	Dates	Description
1	05-11-2018	- Meeting with Pr. Susana COSTAS. - Bibliography: • Handbook of Beach and Shore face Morphodynamics; • Site: "CoastSnap: Community Beach Monitoring"; • Author: ANDREW D. SHORT: conceptual models of beach dynamics; • Website «www.pangea.de »: German oceanographic website, open source data. • Dynamic Morpho of Beaches and Dunes: How and Why (Scolamar presentation by Susana): • Classification of coasts and parametrization of morphodynamic criteria, classification of dunes; Impact of storms on the morphology of the beaches and on the decline of the coastline.
2	06-11-2018	Bibliographical research on : • Extraction of the multitemporal shoreline by remote sensing • Meeting with Susana and her German student and discussion of Google Engine coastline extraction from Landsat imagery from 1984 to present. Discussion with a student from Valencia, Spain, whose team has developed an algorithm for accurately extracting the coastline from Landsat images as points and discussing the possibility of testing their algorithm on Moroccan coasts.
3	07-11-2018	Morning: Bibliographic research on the effects of storms on the coast in anticipation of the meeting with Pr. Oscar Ferreira. Afternoon : Discussion with Pr. O. Ferreira about coastal risks.
4	08-11-2018	Morning: field trip with Susana Costa at Praia de Faro beach to see the dynamics of beaches (cf photos). Afternoon: bibliographic research on Google Engine and the processing of very high temporal resolution satellite images. Sketch of work on the Tangier coastline from spot images acquired in an old Tempus project: identification of images and start of treatments for the best possible extraction of the coastline.

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5	09-11-2018	One-day field trip to Albufeira to see the rocky coast with Pr Delminda Moura and Pr Duarte Duarte and an International Master class: MARINE AND COASTAL SYSTEMS MASTER PROGRAM (MACS - SIMCO) to identify: • The coastal changes ; • Evolution of shoreland on sandy and rockycoast; • Coastal plains and structural erosion, arid climate and touristics problems: the morpho climatic context is not favorable to the resilience of the littoral. • Anthropic contributions by the dumps: 80% of sand applied by river are trapped by dumps! ***1st stop:*** *Galé beach*: pocketbeach, karst environment, dissolution of the calcarenite rock of the cliffs which causes the appearance of "karstichole" (see photos) Techniques to reconstruct Meansealevel and determine changes in sea level by observing the staging of organisms on the intertidal space (Balanus, Borres, Limenaria). ***2nd stop:*** *Armação de Pera*: fossil dunes and current dunes. End of the week: image processing and reading • Book: « Beaches and Coast » by Richard a. Davis JR and Duncan M. Fitlzgerald • Book : Beach and Shore face Morpho dynamics by Andrew D. Short
6	12-11-2018	• Discussion with Katerina about this work on coastal resilience and the contribution of remote sensing in this area. (Katerina's articles and her bibliography for preparing the work for resilience). • 10h: meeting with Pr. O. Ferreira to discuss his lecture « Marine and Coastal Hazards »: description of the course and the exercises that the professor gives to the students of the international master: • Notions on the Coastal Index that is used to estimate coastal erosion or coastal submersion. • Cartography mapping Coastal Erosion and Flooding of Coastal Areas.
7	13-11-2018	• Further bibliographic research on coastal vulnerability indices; • Preparation of course and course drafts; • Download Sentinel 2A satellite images; • Spot and Sentinel image processing.
8	14-11-2018	• Morning: with Susana following her presentation at the ScolaMAR Oualidia workshop October 2018: empirical models of sediment transport by wind, swell and their speed and direction as well as the density of vegetation. • Afternoon: continuation of the bibliographic research on: - Coastal dune; - Resilience; - Coastalvulnerability index; - Preparation of documents that will be used as course materials and TPs on the vulnerability of the coastal zone.
9	15-11-2018	• Course preparation on the Coastal Index: based on the reference articles that describe the index: • "Selecting coastal hotspots to storm inpacts at the regional scale: A Coastal Risk Assessment Framework" artice in: "Coastal Engineering Sept 2017: authors: Christophe Viavattene et al Revue Coastal Engineering 134 (218) pp 33-47. • • Brief interview with Prof. O.Ferreira on the description of his course.
10	16-11-2018	PM : defense.

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

The content of my mission is interesting in several ways:

1. To the module I propose in the Master's degree: in addition to the theoretical part of Geographical Information Systems that I already master and that I teach since a 10th of a year, I will start practical work and mini- projects, just like those I was able to follow during my mission;
2. At Abdelmalek Essaâdi University: by integrating this practical work into a module: GIS and decision-making in the Engineering Geoinformation accredited to the Tangier FST;

To the ScolaMAR project: by teaching this module if it is necessary in all the Moroccan faculties members of the consortium to spread the methodology adopted by the colleagues of the UALG.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

The results of my mission will be disseminated in several ways:

1. First, I will send a detailed report of my mission to the coordinators of the project on the Moroccan side and the European side;
2. At the end of all the missions scheduled for ScolaMAR, a meeting will be organized by the project leader: Pr. EL MOUMNI, for the assembly of the module projects, and at that moment, I will present the results of my mission and the articulation of the module that I propose;

Based on the overall content of the mission, I am writing a project between our two research teams (UALG and UAE) in the field of coastal risks, and the documents and the results of this project will be the basis of the project. assembly of the practical work, as well as the preparation of the field trips for the Master.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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Photo de la soutenance de Master le 16-11-2018 :
“Aeolian sediment transport potentials and dune evolution in Ancão Peninsula (Ria Formosa), Portugal”

Sortie sur le terrain le 9-11-2018 (Albufeira) avec les étudiants du Master International dirigée par le Pr Delminda Maura de l’UALG

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of the European Union

Photo du lieu de travail au sein du laboratoire CIMA de l'UALG

Co-funded by the
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of the European Union

PEDAGOGICALTOOL-KIT
Teaching module

Module title	TELEDETECTION ET TRAITEMENT D'IMAGES OPTIQUES
Thematic(s)	TECHNOLOGIE DE L'INFORMATION ET DE COMMUNICATION
Type of module *(Select one or more boxes)*	☒ Lecture course ☒Tutorial exercice ☒ Practical exercice ☐Group workshop ☒ Field trip ☐Other – precise:

Teaching manager	P. SUSANA COSTAS
Speakers *(Precise if external speakers)*	Miriam WAHBI

Year / Semester	2
Number of hours	60 hours
Number of groups	1

Objectives	• Give an overview of the methods used in remote sensing. • Master the concept of digital satellite image. • Know and use the main image processing functions in the coastal zone. • framework of thematic mini-studies around the coastline and the coastal zone.
Content	**Chapter 1- PHYSICAL BASES OF REMOTE SENSING** I. Definition of electromagnetic radiation; II. The properties of electromagnetic radiation. **Chapter 2- SPECTRAL PROPERTIES OF NATURAL SURFACES** I. Spectral behavior of vegetation; II. Spectral behavior of water; III. Spectral behavior of rocks and minerals; IV. Spectral behavior of soils. **Chapter 3 - SENSORS AND VECTORS** I. Sensors; Ocean color sensors II. Vectors. **Chapter 4 - SATELLITE IMAGES** I. Definition; II. Spatial resolution; III. Spectral resolution; IV. Radiometric resolution; V. Temporal resolution.

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	Chapter 5 - IMAGE PROCESSING (Practical work in a software package ENVI and / or ERDAS image processing) I. Pretreatments; II. Enhancements and visual interpretation; III. Colorful composition; IV. Filters and spectral indices; V. Classifications; VI. Calculation of the surface temperature of the SST water; VII. Calculation of chlorophyll concentration; VIII. Calculation of turbidity.
Teaching methods	1. Lecture in the form of PowerPoint presentation and printed document; 2. Practical work in the computer room using free software; 3. Mini-projects: projects (real CPS) will be given to the learners; 4. Field trip: maps, images and GPS will be made available to learners.
Knowledge required	This module must be programmed after the major modules directly related to the title of the training on the one hand and secondly after the remote sensing module which represents the acquisition of digital information for GIS.
Skills required	
Equipment required	QGIS and SNAP Software
Type of evaluation *(Select one or more boxes)*	☒Oral – precise: ☒Written – precise: ☒Other – precise:
Comments on evaluations *(Precisions on criteria)*	1. Continuous control: 40% ; 2. Projects: 20%; 3. Practical activity: 40% (20% for both reports and 20% for oral presentations).

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **11/11/2018** till **25/11/2018**
Duration (days) – excluding travel days: 15 days

The Staff Member

Last name (s)	Youssef	First name (s)	BAKRI
Nationality	Moroccan	AcademicYear	2018-2019
Position	Professor, Head of the Department of Biology		
E-mail address	ybakri@gmail.com		

The sending university

Name	Mohammed V Universitu in Rabat
Faculty/Department	Faculty of Sciences/Department of Biology
Address	4 Avenue Ibn Battota, PB 1014 R.B, Rabat
Country	Morocco

Contact person

First/Last name(s)	Abdellah AMAR
Position	Professor, ScolaMAR coordinator-Morocco

The receiving university

Name	University of Algarve
Faculty/Department	Faculty of Science and Technologies/ CCMAR
Address	Gambelas, 8005-Faro
Country	Portugal

Contact person

First/Last name(s)	Adelino Vicente Mendonça Canário	
Position	Professor, ScolaMAR coordinator-Portugal	

Type of mobility

☐Technical skills
XInnovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Objective(s) of the mobility

The ScolaMAR project aims to support the socio-economic dynamics experienced by Morocco in general and the Tangier - Tetouan - Al Hoceima region in particular.

- ✓ **observe, learn and work with our with our Portuguese colleagues to master a pedagogical skill and methodology;**
- ✓ **Exchange our teaching and research experiences in Marine Biology;**
- ✓ **Define and take the form of a synthesized tool-kit for innovative module that states the pre-requisites the Master Module "Valorization of Maritime Resources and Population Dynamics";**
- ✓ **develop others news innovative pedagogical modules in a new environment.**

Module project

Module : Valorisation des ressources maritimes et dynamique des populations

OBJECTIFS DU MODULE

- Formaliser les processus biologiques par l'intermédiaire de différentes approches de modélisation mécaniste, statistique et théorique.
- Acquérir plus généralement des compétences dans le domaine de la modélisation.
- Introduire les modèles élémentaires de la dynamique des populations, de la dynamique des interactions, et de l'écologie des communautés.
- Donner une initiation à l'analyse mathématique des systèmes dynamiques.
- familiariser les étudiants avec plusieurs types de modèles mathématiques, leur utilisation et leur application à des problèmes biologiques. L'accent est mis sur la simulation numérique, tout en fournissant les outils analytiques pour comprendre et interpréter les résultats des analyses numériques.

CONTENU

1. **Analyse numérique**

- Modèles déterministes continues et discrètes (équations différentielles ordinaires EDO).
- Les effets stochastiques et leurs impacts sur le fonctionnement d'un système dynamique.
- Les modèles statistiques temporelles (chaînes de Markov discrètes et continues)
- Modélisation spatio-temporelle, déterministe et stochastique (équations différentielles partielles EDP, modèles individus centrés IBM, le lien entre les deux)
- Résolution numérique de ces modèles
- Méthodes d'estimation de paramètres

2. **Modélisation**

- Introduction à la modélisation
- Différents types de modèles I : statistiques (modèle linéaire et ANOVA) et probabilistes.
- Différents types de modèles II : modèles analytiques et simulations
- Validation des modèles, étude de sensibilité

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3. **Systèmes dynamiques et statistique pour l'écologie marine : remise à niveau dynamique des populations**

- Dynamique d'une population non structurée, démographie d'une population structurée
- La densité-dépendance ; l'exploitation optimale d'une population densité-dépendante
- La prédation et la compétition : modèles classiques de la dynamique de populations couplées. Notions d'analyse des systèmes dynamiques
- Structuration des communautés écologique marine, origine et dynamique de la biodiversité

4. **Statistique**

- Initiation à R
- Statistiques inférentielles (estimation et tests d'hypothèses)
- Régression simple, régression non-linéaire et analyse de la variance à un facteur
- Méthodes multivariées (ACP, AFC, AFD, classification)

5. **Travaux pratiques**

Les séances de TP seront consacrées à l'analyse sous ordinateur des données écologiques échantillonnées au terrain, en appliquant les différentes analyses numériques et modèles du cours.
Application 1/ Application des modèles statistiques temporelles, voir les chaînes de Markov discrètes et continues.
Application 2/ Modélisation spatio-temporelle, déterministe et stochastique, la prédation et la compétition : modèles classiques de la dynamique de populations couplées. Notions d'analyse des systèmes dynamiques

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons,meetings, trainings, conferences, field trips)

Day	Dates	Description
1	*Sunday 11th November 2018*	Departure at 12:00 from Rabat, flight from Casablanca airport at 16:40. Arrived at Faro airport at 00:00 (5:00 scale in Lisbon airport).
2	*Monday 12th November 2018*	✓ Arrived at 10:00 at the Faculty of Sciences and Technology, Algarve University and made the first contact with Prof. CANARIO and developed the Erasmus+ and stay program. ✓ Visit with Prof CANARIO to the various laboratories of the Marine and Environment Research Center and the European Marine Resources Center. ✓ Meeting with the Vice-President of Algarve University, Prof. TEODOSIO Alexendra and Prof. CANARIO : organize all the activities of our stay.
3	*Tuesday 13th November 2018*	✓ 8H30-12H00: Participation in the practical class of marine Ecology with Dr Joana GRUZ. ✓ 14H00-17H00: Participation at the ecological field with the students of License (Bachelor's degree) in Biology Marine, and Dr Joana GRUZ. Objectives of the: methods of collection of zooplankton. Data analysis.
4	*Wednesday 14th November 2018*	✓ 9H00: visit of the Laboratory Ecology Marine and the Restoration of the Ecosystems. Session of exchange of experience with the teachers and the students PhD students and discussions of their subjects of PhD. ✓ 14H00: Ceremony : Signature of Agreement between University Mohammed V, University Hassan and University of Algarve.

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5	*Thursday 15th November 2018*	Meetings Pr Rui ORLANDO PIMENTA SANTOS: ALGU Groups, CCMAR Pr HERNIQUE: laboratory Organic electronics
6	*Friday 16th November 2018*	Meetings with: ✓ Professor Rosa FREITAS, University of Aveiro, Portugal. Framing new future collaborations between University Mohammed V and University of Aveiro in marine ecological sciences. ✓ Professor Tao LI, University of Shanghai, China. Proposals for future collaborations with a visit to University of Shanghai in 2019.
7	*Monday 19th November 2018*	Meetings: Pr Gracia MIGUEL, Laboratory of valuation of natural products Pr Dina SIMENS: biomark Groups, CCMAR Pr Clara VIEGAS: Chief operating officer GenoGla (Research and Diagnoses)
8	*Tuesday 20thNovember 2018*	Visit of Laboratory "Aquaculture" and meeting with Pr Sofia Ergolfa. Working session on the data sheet of the Module " Modelling and valorization of the marine resources " proposed in the International Master's degree Sciences of Coast.
9	*Wednesday 21th November 2018*	Meetings Pr Luisa CUSTODIO: Xtreme BioGroup, CCMAR Pr Karim ERZINI: CCMAR, Center of Sciences of the sea
10		**Second Annual Meeting of the International Joint-Research Centre for Marine Science (JRCMS)** Programme 21st November 10:00 Welcome and opening of meeting Prof. Paulo Águas, Rector of the University of Algarve (UAlg) Prof. Jiale Li, Vice-President of Shanghai Ocean University (SHOU) Prof. Liangbiao Chen (SHOU), Director of JRCMS Prof. Adelino Canário (UAlg-CCMAR), Co-Director of JRCMS Signature of Agreement between Shanghai Ocean University and IPMA (National Institute for the Sea and Atmosphere) Prof. Miguel Miranda, President of IPMA Prof. Jiale Li, Vice-President of SHOU 10:30 Coffee break 10:45 Student exchange SHOU-UAlg • Cármen Sousa (PhD student) - "Transcriptomics of primary immune response to lps in Notothenia coriiceps" • Lisen Li (PhD student) - title to be indicated • Stefan Fernandes (Master student) - title to be indicated 11:15 Ongoing Marine Science projects between Portugal and China • Lianbiao Chen (SHOU) – "Evolution of host defense in notothenioid fishes in the Antarctic Ocean" • Maria Adelaide Almeida (U. Aveiro) – Phage therapy: and innovative technology to inactivate pathogenic bacteria in European seabass (Dicentrarchus labrax); • Deborah Power (UAlg-CCMAR) – "Uncovering the immunological repertoire of bivalves of the genus Mytilus through a comparative genomic based approach" • Rosa Freitas (U. Aveiro) - "Safety and sustainable management of valuable clam product in Portugal and China" • Jorge Dias (Sparos) - "Fish feeds - from start-up to the world"
11		

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12	Sunday 24th November 2018	Departure at 8H00 from Faro, flight from Faro airport at 11H15. Arrived at Casablanca airport at 15H55.

Add linesto the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

In terms of training, the project aims to strengthen the Moroccan human potential and other European universities specializing in Marine Biology. the aim is to strengthen the establishment of an autonomous competence center in littoral science and the management and valorization of marine resources, and thus to develop know-how in terms of data acquisition and management with the aim of result the training of qualified research students and the scientific valorization of the data collected.
This project fits perfectly in the priority lines of Eurasmus + cooperation. This cooperation is considered as a process of transfer of know-how, knowing that the Moroccan team of our University Mohammed V, Faculty of Science of Rabat already has a long experience in the study of marine biology and ecology, socio-economic aspects associated with the exploitation of natural resources and the sustainable management of marine environments.
This project, combining ecological, biological and socio-economic data, will make it possible to identify priorities for action to ensure the protection and heritage management of marine ecosystems as quickly as possible, based on the sensitization of users.

IMPACT

Howwill you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Dissemination of the results of our meetings with our Portuguese colleagues.
Preparation of a meeting or workshop "Marine Sciences Meeting" by inviting colleagues from the University of Algarve, Faro. This initiative will be an opportunity to set up a first collaboration between the two universities.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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PEDAGOGICALTOOL-KIT
Teaching module

Module title	**Valorization of maritime resources and population dynamics**
Thematic(s)	Marine biology and ecology, Biotests and Bioresources in the Marine Environment
Type of module *(Select one or more boxes)*	☐X Lecture course ☐Tutorial exercice ☐X Practical exercice ☐XGroup workshop ☐X Field trip ☐Other – precise:

Teaching manager	BAKRI YOUSSEF
Speakers *(Precise if external speakers)*	HAMID RGUIBI IDRISSI

Year / Semester	2020/S2
Number of hours	40H
Number of groups	25

Objectives	
Content	
Teaching methods	
Knowledge required	
Skills required	
Equipment required	
Type of evaluation *(Select one or more boxes)*	☐XOral – precise: ☐XWritten – precise: ☐Other – precise:
Comments on evaluations *(Precisions on criteria)*	

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Objectives

- Formaliser les processus biologiques par l'intermédiaire de différentes approches de modélisation mécaniste, statistique et théorique.
- Acquérir plus généralement des compétences dans le domaine de la modélisation.
- Introduire les modèles élémentaires de la dynamique des populations, de la dynamique des interactions, et de l'écologie des communautés.
- Donner une initiation à l'analyse mathématique des systèmes dynamiques.
- familiariser les étudiants avec plusieurs types de modèles mathématiques, leur utilisation et leur application à des problèmes biologiques. L'accent est mis sur la simulation numérique, tout en fournissant les outils analytiques pour comprendre et interpréter les résultats des analyses numériques.
- Recevoir des données théoriques et pratiques sur la dynamique des populations (croissance, mortalité…), les méthodes d'évaluation des stocks (Directes et indirectes) ainsi que les méthodes de gestion des ressources halieutiques et de l'exploitation durable et rationnelle des pêcheries.
- Mettre en relation les mécanismes biologiques des espèces d'élevage avec les techniques employées tout au long du cycle de production de mollusques, crustacés et algues
- Mettre l'accent sur la bio reproduction en milieu marin et les tests de molécules biologiques et de molécules de synthèse sur des organismes marins diversifiés (poissons, mollusques, échinodermes..)

Content

1. Analyse numérique

- Modèles déterministes continues et discrètes (équations différentielles ordinaires EDO).
- Les effets stochastiques et leurs impacts sur le fonctionnement d'un système dynamique.
- Les modèles statistiques temporelles (chaînes de Markov discrètes et continues)
- Modélisation spatio-temporelle, déterministe et stochastique (équations différentielles partielles EDP, modèles individus centrés IBM, le lien entre les deux)
- Résolution numérique de ces modèles
- Méthodes d'estimation de paramètres

Modélisation

- Introduction à la modélisation
- Différents types de modèles I : statistiques (modèle linéaire et ANOVA) et probabilistes.
- Différents types de modèles II : modèles analytiques et simulations
- Validation des modèles, étude de sensibilité.

2. Systèmes dynamiques et statistique pour l'écologie marine : remise à niveau dynamique des populations

- Dynamique d'une population non structurée, démographie d'une population structurée
- La densité-dépendance ; l'exploitation optimale d'une population densité-dépendante
- La prédation et la compétition : modèles classiques de la dynamique de populations couplées. Notions d'analyse des systèmes dynamiques
- Structuration des communautés écologique marine, origine et dynamique de la biodiversité

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Statistique

- Initiation à R
- Statistiques inférentielles (estimation et tests d'hypothèses)
- Régression simple, régression non-linéaire et analyse de la variance à un facteur
- Méthodes multivariées (ACP, AFC, AFD, classification)

3- Valorisation des ressources marines

- Resource halieutique
- Pêcherie
- Population et stock
- Recrutement
- Classe d'âge et cohorte
- Phase de développement d'une pêcherie
- Abondance relative dans une série d'échantillon
- Méthode graphique en coordonnés semi-logarithmiques
- Méthode de Jackson
- Méthode des longueurs moyennes (Beverton et Hold)
- Mortalité naturelle
- Détermination conjointe de la mortalité naturelle et de la mortalité par pêche

4- Biotests et Bioressources en Milieu Marin

- Biologie intégrative sur des organismes modèles en toxicologie marine.
- Approches et les outils liés à la discipline : criblage de molécules d'intérêt, biotests toxicologiques.
- Analyser de manière critique la littérature scientifique.
- Bioessais pharmacologiques et écotoxicologiques
- Biofouling
- Identification et valorosation des molucules
- Bioproduction des microroganismes

Teaching methods

Cours magistraux, Travaux dirigés et pratiques, école de terrain, séminaires, visites….

Knowledge required

Pour une participation optimale au module il est préférable de posséder les connaissances de base en écologie fonctionnelle, génétique, biochimie, biologie cellulaire et moléculaire, telles que délivrées en Licence.

Skills required

Pour une participation optimale au module il est préférable de posséder les connaissances de base en écologie fonctionnelle, génétique, biochimie, biologie cellulaire et moléculaire, telles que délivrées en Licence.

Co-funded by the Erasmus+ Programme of the European Union

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **11/11/2018** till **25/11/2018**
Duration (days) – excluding travel days: 15 days

The Staff Member

Last name (s)	HAMID	First name (s)	RGUIBI IDRISSI
Nationality	Moroccan	AcademicYear	2018-2019
Position	Professor		
E-mail address	hrguibi@hotmail.com		

The sending university

Name	Mohammed V
Faculty/Department	Faculty of Sciences/Department of Biology
Address	4 Avenue Ibn Battota, PB 1014 R.B, Rabat
Country	Morocco

Contact person

First/Last name(s)	Adelino Vicente Mendonça Canário
Position	Professor, ScolaMAR coordinator

The receiving university

Name	University of Algarve
Faculty/Department	Faculty of Science and Technologies/ CCMAR
Address	Gambelas, 8005-Faro
Country	Portugal

Contact person

First/Last name(s)	
Position	

Type of mobility

☐Technical skills
XInnovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Objective(s) of the mobility

The ScolaMAR project aims to support the socio-economic dynamics experienced by Morocco in general and the Tangier - Tetouan - Al Hoceima region in particular.

- ✓ **observe, learn and work with our with our Portuguese colleagues to master a pedagogical skill and methodology;**
- ✓ **Exchange our teaching and research experiences in Marine Biology;**
- ✓ **Define and take the form of a synthesized tool-kit for innovative module that states the pre-requisites the Master Module "Valorization of Maritime Resources and Population Dynamics";**
- ✓ **develop others news innovative pedagogical modules in a new environment.**

Module project

Module : Valorisation des ressources maritimes et dynamique des populations

OBJECTIFS DU MODULE

- Formaliser les processus biologiques par l'intermédiaire de différentes approches de modélisation mécaniste, statistique et théorique.
- Acquérir plus généralement des compétences dans le domaine de la modélisation.
- Introduire les modèles élémentaires de la dynamique des populations, de la dynamique des interactions, et de l'écologie des communautés.
- Donner une initiation à l'analyse mathématique des systèmes dynamiques.
- familiariser les étudiants avec plusieurs types de modèles mathématiques, leur utilisation et leur application à des problèmes biologiques. L'accent est mis sur la simulation numérique, tout en fournissant les outils analytiques pour comprendre et interpréter les résultats des analyses numériques.

CONTENU

1. **Analyse numérique**

- Modèles déterministes continues et discrètes (équations différentielles ordinaires EDO).
- Les effets stochastiques et leurs impacts sur le fonctionnement d'un système dynamique.
- Les modèles statistiques temporelles (chaînes de Markov discrètes et continues)
- Modélisation spatio-temporelle, déterministe et stochastique (équations différentielles partielles EDP, modèles individus centrés IBM, le lien entre les deux)
- Résolution numérique de ces modèles
- Méthodes d'estimation de paramètres

2. **Modélisation**

- Introduction à la modélisation
- Différents types de modèles I : statistiques (modèle linéaire et ANOVA) et probabilistes.
- Différents types de modèles II : modèles analytiques et simulations
- Validation des modèles, étude de sensibilité

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3. **Systèmes dynamiques et statistique pour l'écologie marine : remise à niveau dynamique des populations**

- Dynamique d'une population non structurée, démographie d'une population structurée
- La densité-dépendance ; l'exploitation optimale d'une population densité-dépendante
- La prédation et la compétition : modèles classiques de la dynamique de populations couplées. Notions d'analyse des systèmes dynamiques
- Structuration des communautés écologique marine, origine et dynamique de la biodiversité

4. **Statistique**

- Initiation à R
- Statistiques inférentielles (estimation et tests d'hypothèses)
- Régression simple, régression non-linéaire et analyse de la variance à un facteur
- Méthodes multivariées (ACP, AFC, AFD, classification)

5. **Travaux pratiques**

Les séances de TP seront consacrées à l'analyse sous ordinateur des données écologiques échantillonnées au terrain, en appliquant les différentes analyses numériques et modèles du cours.
Application 1/ Application des modèles statistiques temporelles, voir les chaînes de Markov discrètes et continues.
Application 2/ Modélisation spatio-temporelle, déterministe et stochastique, la prédation et la compétition : modèles classiques de la dynamique de populations couplées. Notions d'analyse des systèmes dynamiques

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons,meetings, trainings, conferences, field trips)

Day	Dates	Description
1	*Sunday 11th November 2018*	Departure at 12:00 from Rabat, flight from Casablanca airport at 16:40. Arrived at Faro airport at 00:00 (5:00 scale in Lisbon airport).
2	*Monday 12th November 2018*	✓ Arrived at 10:00 at the Faculty of Sciences and Technology, Algarve University and made the first contact with Prof. CANARIO and developed the Erasmus+ and stay program. ✓ Visit with Prof CANARIO to the various laboratories of the Marine and Environment Research Center and the European Marine Resources Center. ✓ Meeting with the Vice-President of Algarve University, Prof. TEODOSIO Alexendra and Prof. CANARIO : organize all the activities of our stay.
3	*Tuesday 13th November 2018*	✓ 8H30-12H00: Participation in the practical class of marine Ecology with Dr Joana GRUZ. ✓ 14H00-17H00: Participation at the ecological field with the students of License (Bachelor's degree) in Biology Marine, and Dr Joana GRUZ. Objectives of the: methods of collection of zooplankton. Data analysis.
4	*Wednesday 14th November 2018*	✓ 9H00: visit of the Laboratory Ecology Marine and the Restoration of the Ecosystems. Session of exchange of experience with the teachers and the students PhD students and discussions of their subjects of PhD. ✓ 14H00: Ceremony : Signature of Agreement between University Mohammed V, University Hassan and University of Algarve.
5	*Thursday 15th November 2018*	Meetings Pr Rui ORLANDO PIMENTA SANTOS: ALGU Groups, CCMAR Pr HERNIQUE: laboratory Organic electronics

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6	*Friday 16th November 2018*	Meetings with: ✓ Professor Rosa FREITAS, University of Aveiro, Portugal. Framing new future collaborations between University Mohammed V and University of Aveiro in marine ecological sciences. ✓ Professor Tao LI, University of Shanghai, China. Proposals for future collaborations with a visit to University of Shanghai in 2019.
7	*Monday 19th November 2018*	Meetings: Pr Gracia MIGUEL, Laboratory of valuation of natural products Pr Dina SIMENS: biomark Groups, CCMAR Pr Clara VIEGAS: Chief operating officer GenoGla (Research and Diagnoses)
8	*Tuesday 20thNovember 2018*	Visit of Laboratory "Aquaculture" and meeting with Pr Sofia Ergolfa. Working session on the data sheet of the Module " Modelling and valorization of the marine resources " proposed in the International Master's degree Sciences of Coast.
9	*Wednesday 21th November 2018*	Meetings Pr Luisa CUSTODIO: Xtreme BioGroup, CCMAR Pr Karim ERZINI: CCMAR, Center of Sciences of the sea
10		**Second Annual Meeting of the International Joint-Research Centre for Marine Science (JRCMS)** Programme 21st November 10:00 Welcome and opening of meeting Prof. Paulo Águas, Rector of the University of Algarve (UAlg) Prof. Jiale Li, Vice-President of Shanghai Ocean University (SHOU) Prof. Liangbiao Chen (SHOU), Director of JRCMS Prof. Adelino Canário (UAlg-CCMAR), Co-Director of JRCMS Signature of Agreement between Shanghai Ocean University and IPMA (National Institute for the Sea and Atmosphere) Prof. Miguel Miranda, President of IPMA Prof. Jiale Li, Vice-President of SHOU 10:30 Coffee break 10:45 Student exchange SHOU-UAlg • Cármen Sousa (PhD student) - "Transcriptomics of primary immune response to lps in Notothenia coriiceps" • Lisen Li (PhD student) - title to be indicated • Stefan Fernandes (Master student) - title to be indicated 11:15 Ongoing Marine Science projects between Portugal and China • Lianbiao Chen (SHOU) – "Evolution of host defense in notothenioid fishes in the Antarctic Ocean" • Maria Adelaide Almeida (U. Aveiro) – Phage therapy: and innovative technology to inactivate pathogenic bacteria in European seabass (Dicentrarchus labrax); • Deborah Power (UAlg-CCMAR) – "Uncovering the immunological repertoire of bivalves of the genus Mytilus through a comparative genomic based approach" • Rosa Freitas (U. Aveiro) - "Safety and sustainable management of valuable clam product in Portugal and China" • Jorge Dias (Sparos) - "Fish feeds - from start-up to the world
11		
12	Sunday 24th November 2018	Departure at 8H00 from Faro, flight from Faro airport at 11H15. Arrived at Casablanca airport at 15H55.

Add linesto the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

In terms of training, the project aims to strengthen the Moroccan human potential and other European universities specializing in Marine Biology. the aim is to strengthen the establishment of an autonomous competence center in littoral science and the management and valorization of marine resources, and thus to develop know-how in terms of data acquisition and management with the aim of result the training of qualified research students and the scientific valorization of the data collected.
This project fits perfectly in the priority lines of Eurasmus + cooperation. This cooperation is considered as a process of transfer of know-how, knowing that the Moroccan team of our University Mohammed V, Faculty of Science of Rabat already has a long experience in the study of marine biology and ecology, socio-economic aspects associated with the exploitation of natural resources and the sustainable management of marine environments.
This project, combining ecological, biological and socio-economic data, will make it possible to identify priorities for action to ensure the protection and heritage management of marine ecosystems as quickly as possible, based on the sensitization of users.

IMPACT

Howwill you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Dissemination of the results of our meetings with our Portuguese colleagues.
Preparation of a meeting or workshop "Marine Sciences Meeting" by inviting colleagues from the University of Algarve, Faro. This initiative will be an opportunity to set up a first collaboration between the two universities.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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UNIVERSITE DE BRETAGNE OCCIDENTALE

From	To	University	Staff name
12/11/2017	25/11/2017	Abdelmalek Essaâdi Tangier	EL BAKALI Maryam
26/11/2017	09/12/2017	Ibn Tofail Kenitra	AIT FORA Abderrahman
03/12/2017	15/12/2017	Chouaib Doukkali El Jadida	SALHI Fouad
15/01/2018	19/01/2018	Ibn Tofail Kenitra Ibn Tofail Kenitra	TOUAHNI Raja MESSOUSSI Rochdi
12/03/2018	24/03/2018	Mohammed V Rabat	AMMAR Abdellah
11/11/2018	17/11/2018	Abdelmalek Essaâdi Tangier	BARAKAT Amina
13/11/2018	26/11/2018	Mohammed V Rabat	MHAMMDI Nadia
18/11/2018	01/12/2018	Mohammed V Rabat	EL MOUDNIB Lahcen
05/12/2018	14/12/2018	Abdelmalek Essaâdi Tangier	SEFRIOUI Sarra

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[12/11/2017]** till **[25/11/2017]**
Duration (days) – excluding travel days: 12 days ……

The Staff Member

Last name (s)	EL Bakali El Aissaoui	First name (s)	Maryam
Nationality	Morrocan	Academic Year	2017 - 2018
Position	Teacher-researcher		
E-mail address	Elbakalimaryam@yahoo.fr		

The sending university

Name	Abdelmalek Essaâdi University
Faculty/Department	Polydisciplinary Faculty of Larache / Department of Life Sciences
Address	BP 745, Poste Principale 92004-Larache
Country	Morocco

Contact person

First/Last name(s)	Mr. Bouchta El Moumni
Position	Dean of the Polydisciplinary Faculty of Larache

The receiving university

Name	University of Western Brittany (UBO)
Faculty/Department	European Institute for Marine Studies
Address	IUEM Technopole Brest-Iroise-rue Dumont d'Uvrille 29280 Plouzané
Country	France

Contact person

First/Last name(s)	Mr. David Graindorge
Position	Professor

Type of mobility

☐ Technical skills

☒Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Having carried out a job shadowing at European Institute for Marine Studies, I intend to develop my competence regarding my project's module by improving pedagogical skills and learning about new methodologies and pedagogical approaches. These skills will enable me to promote innovation and development in my university as well as enhance the exchange of experience on pedagogical methods. I also aim at transferring knowledge from the experiences and good practices of European Institute for Marine Studies and thereby acquiring practical skills relevant for the current ScolaMar project.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	13/11/2017	Once arrived at European Institute for Marine Studies, I was welcomed by ScolaMar coordinators. Afterwards, European Projects Manager Miss Justine Rodier, took me to the offices of the staff I would need during my Job shadowing.
2	14/11/2017	I had a meeting with professor Eric Deslandes, the Co- coordinator of Master in Marine and Costal Sciences who showed me the various teaching units of biology mention of master, and suggested as well as explained me the program of my job shadowing. Afterwards, he took me to the offices of the professors intervening in teaching units of biology mention of master Marine and Costal Sciences in order to meet them. I had also the opportunity to take part in Science & Society teaching unit as an evaluator. My participation unfolded in several stages; We began with a meeting in which Miss Rewalenn Ruault, the responsible of pedagogical innovation, explained us the conduit of Sciences & Society teaching unit and the evaluation grid. Later on, we attend workshops in which students presented their works. Finally, a second meeting was held to discuss the results of the evaluators and give subsequently the final mark to every groups. I was very fortunate to participate to this innovative and original method of teaching. Indeed, A group of PhD students are in charge of accompanying an interdisciplinary group of students of M2. Together, they work on a societal problem in connection with their PhD researches. The PhD students lead their team of M2 and mobilize them for creating and operating an innovative valuation of their work with the students of M1.
3	15/11/2017	As part of ecophysiology of marine organisms teaching unit, I shadowed Pr. Jonathan-Fly-Sainte-Marie during his interesting lecture on microphagous diet. He discussed many topics as feeding and metabolism, methods of measuring filter feeding, digestion and assimilation, ingestion of particles. His teaching practices come from the traditional model but are still varied.

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4	16/11/2017	I met professor Stiger-Valerie, the responsible of Master 1 in Marine and Costal Sciences at European Institute for Marine Studies. We discussed the pedagogical practices which are common within the teaching of various teaching units of biology mention of master. Afterwards, she took me to the laboratories where she showed me the various equipment. Later on we went together to the Faculty of sciences in order to shadow her during lab works on the adaptability of seaweed to environmental conditions (effects of salinity, hydrodynamics and desiccation on seaweed cells). Students didn't encounter any difficulties during manipulations in view of the fact that the equipment was available and three professors were training the students.
5	17/11/2017	I shadowed professor Dario Moraga during his two sessions lecture on the populational genetic structure in marine environment in which he explained larval genetic variability among marine organisms, as well as the adaptive response of juveniles and adults facing abiotic fluctuations. I also shadowed professor Philippe Paudaven during his lecture on the biological cycle – recruitment. This day's lectures were fabulously rich with information.
6	20/11/2017	That day, my job shadowing took place exclusively in the faculty of sciences and techniques where I attended Pr. Valerie's lecture on the intraspecific competition among seaweed. Then, I attended a presentation within the framework of master advice, in which various professors presented in turns the teaching units related to master. After that, professor Eric Deslandes made me visit the diverse structures of the departments (computer room, classrooms, laboratories…) thus I could meet the persons responsible thereof who explained me the protocols and the progress of lab works.
7	21/11/2017	I participated in ecophysiology lab works, in which I shadowed professor Erwan Ar Gal pedagogical responsible of Marine Living resources Teaching Unit. The Lab works were chiefly intended for analyzing the physiological responses of marine organisms towards their environment. During these lab works professor Erwan explained to the students the process of the following manipulations: oxygen electrod measurement of the action of some polluants on phytoplankton, exosmosis among benthic seaweed, and measurements of cellular densities. Each of the aforementioned manipulations unfolded in 4 hours. My participation to these lab Works as well as my discussion with professor Erwan have enable me to acquire new practical and technical knowledge. However, I noticed that there were some constraints preventing professors from realizing some lab works, in particular through the lack of material.
8	22/11/2017	It was an exceptional day since I was invited from professor Eric Deslandes to attend a scientific meeting with colleagues of Marinov, the Quebec center for innovation in Aquaculture and fisheries. Marinov, is Canada's largest integrated center for applied reseach in fishing, aquaculture and processing and development of aquatic products. In the course of this meeting, representatives of professors of Marine environment science laboratory of European Institute for Marine Studies, as well as representatives of Marinov presented their research thematics. I was extremely pleased to take part to that interesting meeting. Indeed I seized the opportunity to discuss with eminent researchers, apart from getting to know ongoing research topics besides used techniques. It was a very enriching experience, as much for its scientific as its human dimensions. I made capital out the occasion to discover a well-equipped and innovative conference room. Thereafter, we visited laboratories where professor Erwan Ar Gal explained the way research processes.
9	23/11/2017	I shadowed Professor Dario Moraga during his lecture on the population dynamics and professor Erwan Ar Gal during part 2 of ecophysiology lab work.

10	24/11/2017	During my last day at the European Institute for Marine Studies, I went to the office of Miss Justine Roddier in order that I sign the document of my mobility. I attended later on lectures and lab work of teaching unit of population dynamics, so that we continue courses. Afterwards, I called on the staff members who watched over the progress of the training in favorable conditions, and this in order to see them off and express my gratitude. Thereupon, due to the free afternoon, I seized the opportunity to go sightseeing in downtown Brest.
I wish to take this opportunity to express my sincere gratitude and appreciation to coordinators project ScolaMar for giving me the opportunity to develop my skills in teaching and learn about new pedagogical techniques. A special thanks to professor Eric Deslandes for sacrificing his precious time in order to watch over my training and also for all the documents he provided me. I want also to thank all professors whom I shadowed and worked with. Without omitting to infinitely thank dear Justine Rodier who contributed to the progress of the training in favorable conditions		

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

Attending different teaching units of biology mention of master in Marine and Costal Sciences had many potential benefits on the development and the enhancement of knowledge and competences (be it pedagogic, didactic or methodology) required by marine biology teachers. Indeed, by spending time shadowing several professors and working and discussing with them during the practical work, I learnt new methods and practical technics associated with my teaching module.
Moreover, by participating as an evaluator in UE Science & Society, I discovered a new innovating educational program which could be put into practice in Master's project ScolaMar.
These skills will contribute to the improvement of teaching quality at my university by elaborating an innovating educational program.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Technical and pedagogical competences I acquired during my job shadowing will be an added value to my teaching. Therefore I will pass them on by sending a report, within our institution in order to integrate them into pedagogical training programs. I will share them with other teachers as well through a conference during either summer courses or scientific days which will be organized by Association of Education Evaluation Methodologies (ADMEE). Indeed I am a member of the aforesaid association, and thus we will orchestrate in 2018 scientific days within our institution which are going to be about academic pedagogy domain. As stated above, I will seize the opportunity to make a presentation of my mobility. I can also organize seminaries for master students relating to lectures I observed. Furthermore, I am able to realize lab works I mastered during my training.

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ANNEXES

European Institute for Marine Studies

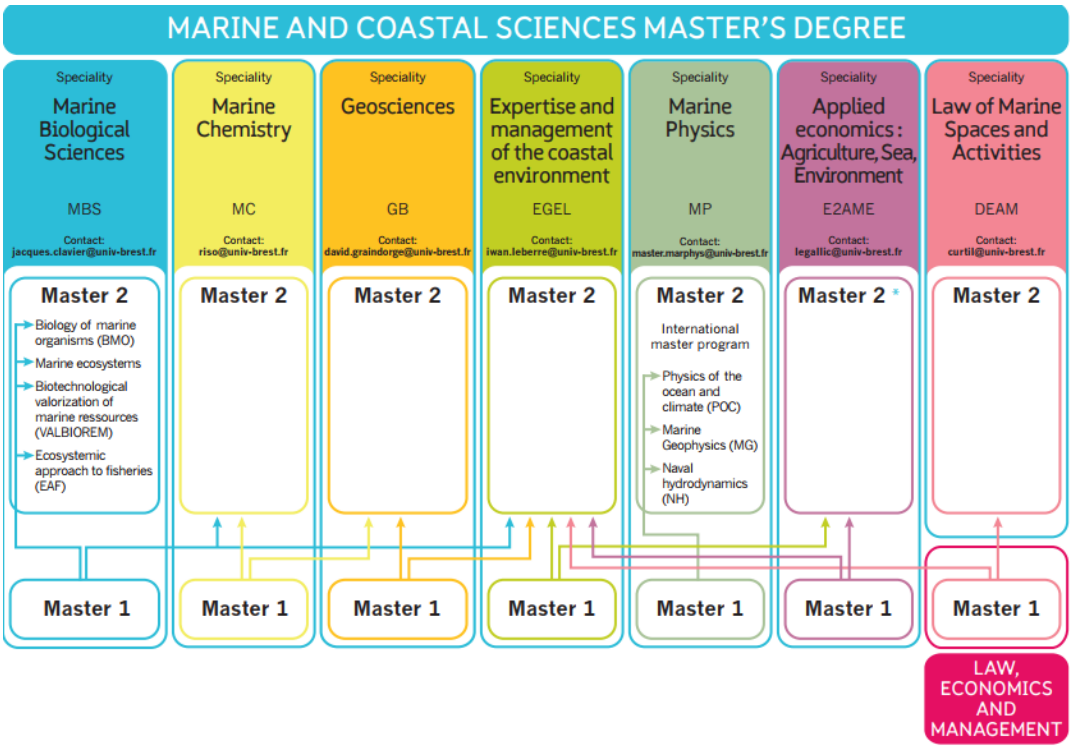
The European Institute for Marine Studies is one of the most important marine science research centers in France. It is a research institute devoted to the ocean and the coastal environment.

The European Institute for Marine Studies is an important component of the University of Western Brittany (UBO). It includes all the laboratories whose research topics relate to the marine environment, from the fields of life sciences, sciences of the universe, or social sciences. it is a multidisciplinary organization that aims to increase understanding of the marine environment, to study and observe the interactions between the ocean and the atmosphere and the coast, to train researchers and scientists in this field and to contribute to the investigations of natural or human-induced modifications in the marine environment.

The European Institute for Marine Studies has three complementary and mutually beneficial missions: Research (seven laboratories), Education (Master's degree in Marine and Coastal Sciences and a doctoral programme in Marine Sciences) and Observation (observatories of coastal and offshore environments, part of the joint service unit).

Master in Marine and Coastal Sciences

The Master in Marine and Coastal Sciences offers seven specialties, vary from human sciences (law, economics and geography) to natural sciences (biology, chemistry, geosciences and physics). The Master's degree has been designed to take an interdisciplinary approach to the themes of Ocean Sciences, internationalization and employability.



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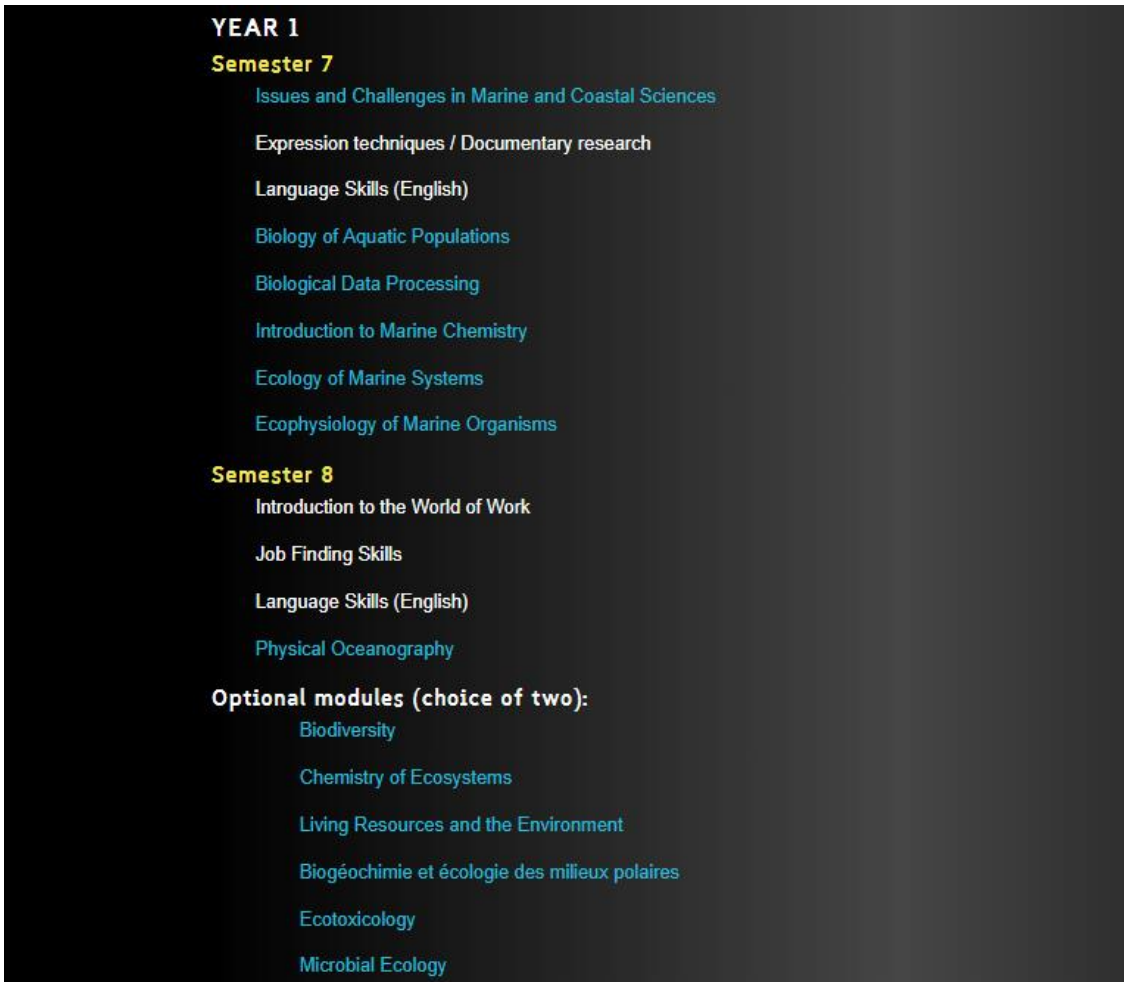
Marine Biological Sciences (MBS)

The purpose of the specialization "Marine Biological Sciences" (MBS) of the domain "Marine and Coastal Sciences" (SML) is to provide general training in marine ecology/biology during the first year (M1) of the Master, and to propose 4 specialties in the second year (M2) corresponding to an orientation toward the biology of marine organisms, marine ecosystems, marine biotechnology and fisheries. Three of the four specialties are mainly oriented towards research (going on to do a PhD afterwards). "VALBIOREM" is the only specialty which is vocationally oriented.



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ScolaMAR

Erasmus+ Capacity building

YEAR 2 SPECIALTY 'BIOLOGY OF MARINE ORGANISMS'

Semester 9

- Project Management, Business Intelligence and Intellectual Property. Projects setup
- Science and Society
- Language Skills (English)
- Marine and Coastal plants: Ecophysiology and Chemodiversity
- Advanced Ecophysiology
- Biochemistry and Molecular Biology for Marine Sciences
- Marine Lipids: Biological Roles and Applications
- Interactions of Organisms

Optional module (choice of one):

- Innovation Management
- Modeling Biological Systems
- Population Responses to Stress in Coastal Areas

Semester 10

Compulsory internship, duration: 5.5 months.

YEAR 2 SPECIALTY 'MARINE ECOSYSTEMS'

Semester 9

- Project management, Business Intelligence and Intellectual Property. Projects setup
- Science and Society
- Language Skills (English)
- Management of Exploited Resources
- Biological Records of the Environment
- Deep-Sea Environments
- Biological Invasions
- Microorganisms in the Marine Environment
- Marine Biogeochemistry

Optional module (choice of one):

- Innovation Management
- Modeling Biological Systems
- Population Responses to Stress in Coastal Areas

Semester 10

Internship

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EDUCATIONAL INNOVATION

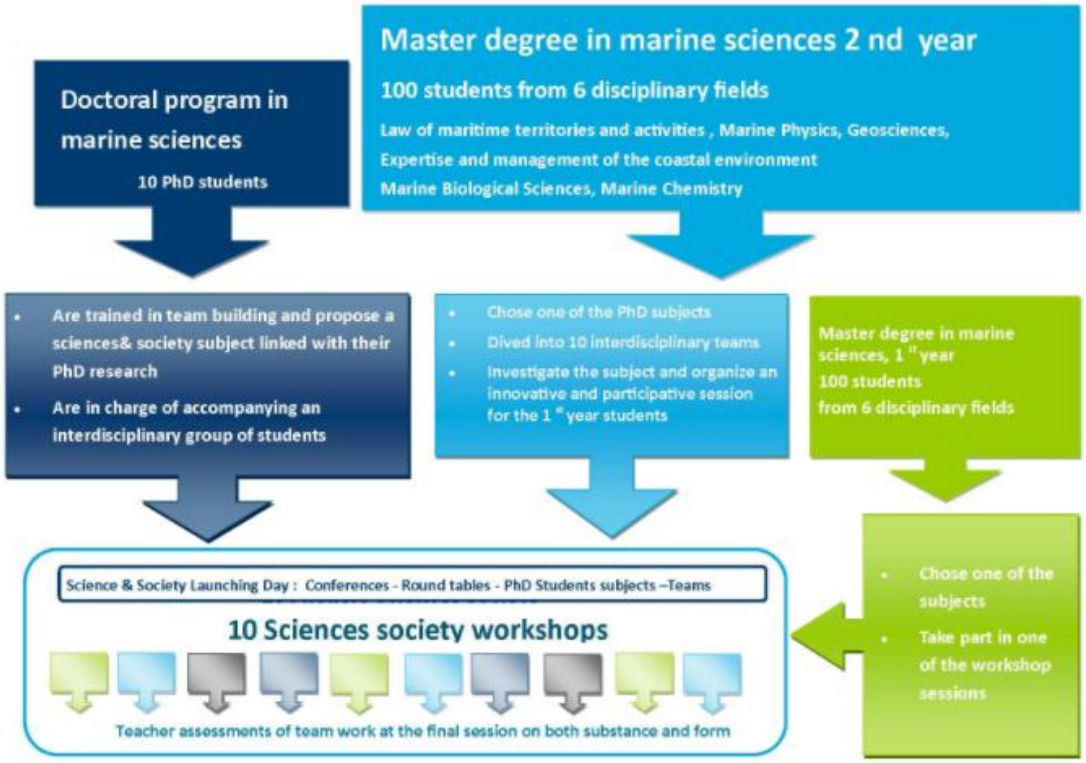
There are several educational innovation:

A teaching unit common to all Master 1 students on issues and problems in marine sciences. This unit aims to reinforce interdisciplinarity, the link between the students of the various mentions, elements of common culture and openness to the scientific questions and the societal stakes of the SML domain.

This innovating educational program is co-piloted by LabexMER and PERISCOPE sciences & society platform. For PERISCOPE, the stake is to develop a culture of interdisciplinary, in particular in the interface man-nature, and to increase awareness to stakes in the sciences & society interface. For the education and training axis of LabexMER and for the persons in charge of the EDSM (Doctoral School of Marine Sciences) and Master's degrees SML (Marine and coastal Sciences), it involves compartmentalizing the disciplinary approaches, but also confronting points of view, enriching the representations, opening education on the world, and creating more links between the students of the different Master's degrees and the PhD students.

A group of PhD students motivated by these interfaces between disciplines and between sciences & society is trained in team building and aware of the science & society stakes. The PhD students and the students of Master's degrees attend in a day of conferences in September. The PhD students are then in charge of accompanying an interdisciplinary group of students of M2, during a month on a dozen hours in October. Together, they will work on a societal problem in connection with their PhD researches.

The PhD students will lead their team of M2 and will mobilize them for creating and operating an innovative valuation of their work with the students of M1 during the EU '' Enjeux et problématiques ''.



Three IT modules: Each student will work on three out of the seven main fields (apart from his/her own field) in the UBO computer workspace.

Three 2-hour conferences: These sessions are proposed on each of the seven main fields (apart from the student's own specialty field and the three subjects already chosen for the computer modules).

Initiation in distance learning in the form of online courses

UE Observatoire (10 students)

Co-funded by the Erasmus+ Programme of the European Union

Master Sciences de la Mer et du Littoral

Mention BIOLOGIE

UE Observatoire

=> projet d'UE pour 10 étudiants MAXIMUM (i.e. 2 groupes TP Bateau)

Code apogée			Composants			Dernière mise à jour le		
Responsable pédagogique	Cécile KLEIN (Maître de conférences)							
Intervenants	• UBO : Olivier GAUTHIER (Maître de conférences), Philippe PONDAVEN (Maître de conférences) • Intervenants extérieurs : Jacques GRALL (Ingénieur de Recherche)							
Type								
Semestre			Volume horaire étudiant		Volume horaire équiv. TD		Crédits ECTS	
Nombre d'heures	CM	6	TD	30	TP terrain	6	TP bateau	6
Nombre de groupes	CM	1	TD	1	TP terrain	1	TP bateau (5 étud/grpe)	2
Prérequis	TDB, ESM, Chimie Marine,...							
Objectif Terminal	Avoir une compréhension complète de l'utilité des services d'observations.							
Objectif Pédagogique	Amener les étudiants à participer à l'acquisition de séries d'observation sur le phytoplancton, le macrobenthos, et les variables environnementales et à répondre à des questions scientifiques à l'aide de ces séries.							
Contenu de l'enseignement	• Présentation générale des services d'Observation en lien avec le milieu marin (locaux, nationaux et internationaux) : qui, quoi, quand, comment et pourquoi ? • Approfondissement sur les structures et le fonctionnement des observations sur les compartiments pélagique et microphytobenthique : différents réseaux mis en place, paramètres suivis (communautés phytoplanctoniques, pigments), toxines, banque de données. • Approfondissement sur les structures et le fonctionnement des observations sur le compartiment benthique • Phytoplancton : méthode et plan d'échantillonnage, acquisition de données sur le terrain, taxonomie et détermination, méthode de comptage, dosage de chlorophylle *in vivo*, efficacité photosynthétique. • Macrobenthos : méthode et plan d'échantillonnage, taxonomie et détermination, acquisition de données sur le terrain. • Physique-Chimie : recours aux données des séries de l'observatoire de l'IUEM (SOMLIT, Ecoflux), mesures sur le terrain pour le macrobenthos • Exploration des questions scientifiques liées à l'observation à l'aide des séries acquises par les étudiants : les jeux de données évoluant au fil du temps, les questions évolueront aussi. • Analyses statistiques uni-, bi-, et multidimensionnelles. Analyses spatio-temporelles.							
Méthodes d'enseignement	• **CM** • **TP/TD** « objectif plancton » : dans ce cadre les étudiants réaliseront la préparation du plan d'échantillonnage et le matériel de la sortie « Objectif Plancton » programme participatif organisé par Océanopolis qui permet la collecte d'échantillons phytoplanctoniques en différents points de la Rade de Brest à un instant t. Les étudiants participeront à cette sortie, et analyseront par la suite en salle de travaux pratiques les échantillons (identifications d'espèces dominantes, dosage de chlorophylle fractionnée, efficacité photosynthétique). L'ensemble des données acquises seront traitées dans un rapport et permettra la valorisation des données acquises au fil des ans. **La journée « Objectif Plancton » étant mise en place en partenariat avec Océanopolis, la date de cette journée est imposée**							

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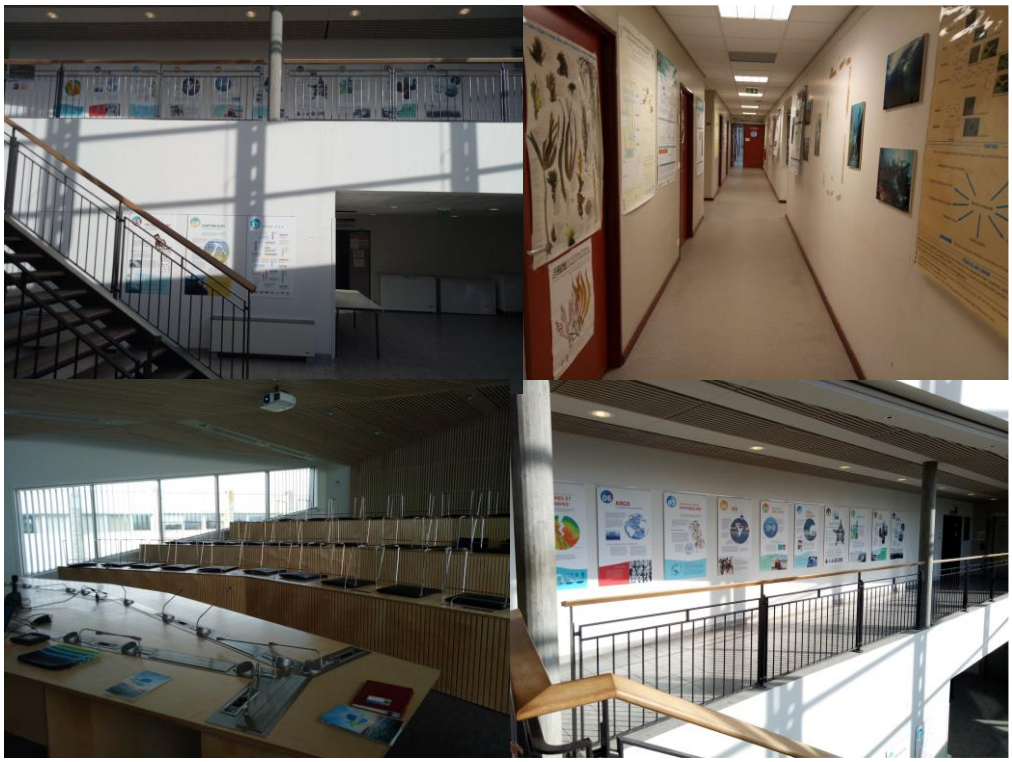
ScolaMAR
Erasmus+ Capacity building



Some structures of the IUEM

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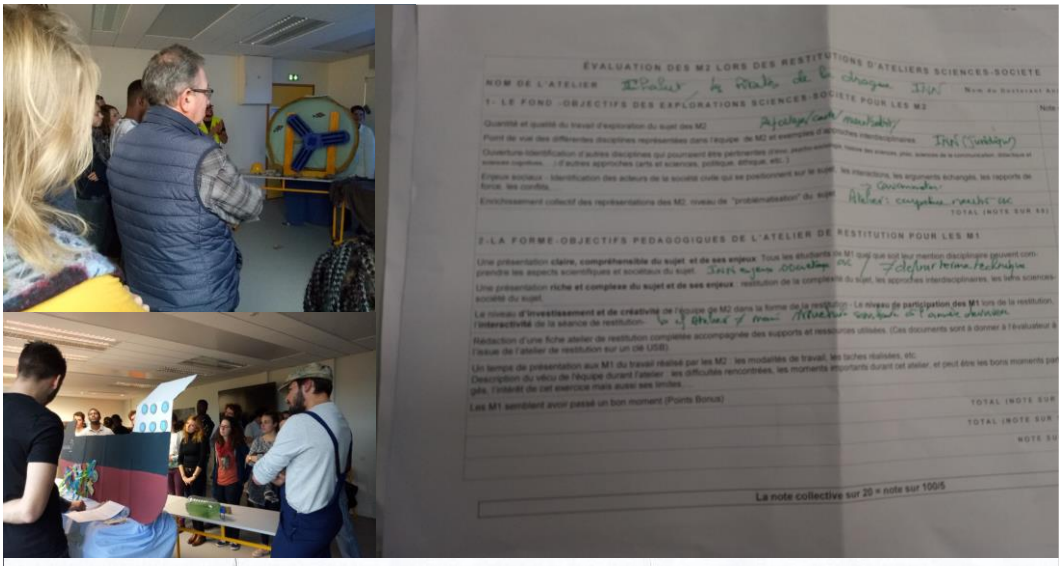
My job shadowing at IUEM (Lectures, lab work, workshops, evaluation grid)



Créneau	Groupe	Titre	Salle	Évaluateurs
13h30 - 15h00	Victor	Vents des globes en orbite sur CanalSat	D104-D107	Marc Suquet / Dominique Simon
	Jean-François	Patella Jones : l'archive perdue	Amphi B	Cécile Nassalang/Cécile Grigné
	William	Chalut, c'est les pirates de la drague !	B-250	Frédérique Alban/Eric Deslandes/Maryam
	Philippe	Panique en mer	Amphi D	Laure Zakrewski/Maïwenn Paul
	Johan	Le plastique, c'est numérique ?	A 215- A 219	Laura Coquereau/Jérome Amann
15h30 - 17h30	Margaux	Le gras, c'est la vie !	A 215- A 219	Marc Suquet / Dominique Simon
	Thomas	Ericard, quand la tempête rit jaune	Amphi B	Laure Zakrewski/Maïwenn Paul
	Florian	On refuse de se fouler !	D104-D107	Eric Deslandes/Maryam/Cécile Grigné
	Jean	EauSS117, la mer ne répond plus !	B-248 - B-250	Laura Coquereau/Jérome Amann/Cécile Nassalang

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My job shadowing at faculty of sciences and techniques (Lectures, lab work, presentation of the teaching units)

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ScolaMAR
Erasmus+ Capacity building

Diverse structures of the Biology department (computer room, classrooms, laboratories…)

Some monuments I visited while sightseeing

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PEDAGOGICAL TOOL-KIT Teaching module

Module title	INTEGRATED AQUACULTURE, AND CONTINENTAL, MARINE AND COASTAL ZONES MANAGEMENT
Thematic(s)	Biological and technical basis of aquaculture, interaction between aquaculture and environment, bio-indicators for sustainable aquaculture, planning and management of continental, marines and coastal aquaculture for a sustainable exploitation
Type of module *(Select one or more boxes)*	☒Lecture course ☒ Tutorial exercise ☒ Practical exercise ☒ Group workshop ☒ Field trip ☐ Other – precise:

Teaching manager	MARYAM EL BAKALI EL AISSAOUI
speakers *(precise if external speakers)*	External speakers (researchers of the national Halieutic Reseach Institute (INRH): Dr. Fatima El Aamri Dr. Afaf Rharrass , Dr. Houda Akharbach, Dr. Kamal Chebaki.

Year / Semester	SEMESTER 9
Number of hours	90H
Number of groups	1 or 2 group
Objectives	After successful completion of this module students are expected to be able to : • Master the interactions between aquaculture practices and environment; • Master scientific basis, and integrated management of continental, marine and costal zones; • identify and explain important technical and biological attributes of aquaculture production systems, including among others nursing and grow-out, feed and pollution issues; • Acquire scientific knowledge and techniques on production systems according to integrated aquaculture principles; • Acquire scientific knowledge and techniques relative to sustainable aquaculture practices
Content	**Biological and technical basis of aquaculture**, physiology of marines organisms **(**Fish, bivalve and crustaceans**),** Bioenergetic (food, growth, biotic and environmental factor effect…**),** Ecophysiology of macroalgae, reproductive biology and genetics in fish (mode and strategies of reproduction, genetic sex determination, gonadal development, sex differentiation, mode of natural reproduction, controlled maturation and spawning, embryonic development…)), Stress in aquaculture (stressful agents, stress management…) rearing technique… **Interaction between aquaculture and environment:** impact of pollution on ecosystems, Response of marine organisms to the presence of pollutants, environment quality and its effects on the farming**,** production systems and interactions with the environment, bio-indicators for sustainable aquaculture ….) **Planning and management of continental, marines and coastal aquaculture for a sustainable exploitation:** principle of integrated management of continental, marine and coastal zones: continental, marine and coastal ecosystems, aquaculture systems, innovative

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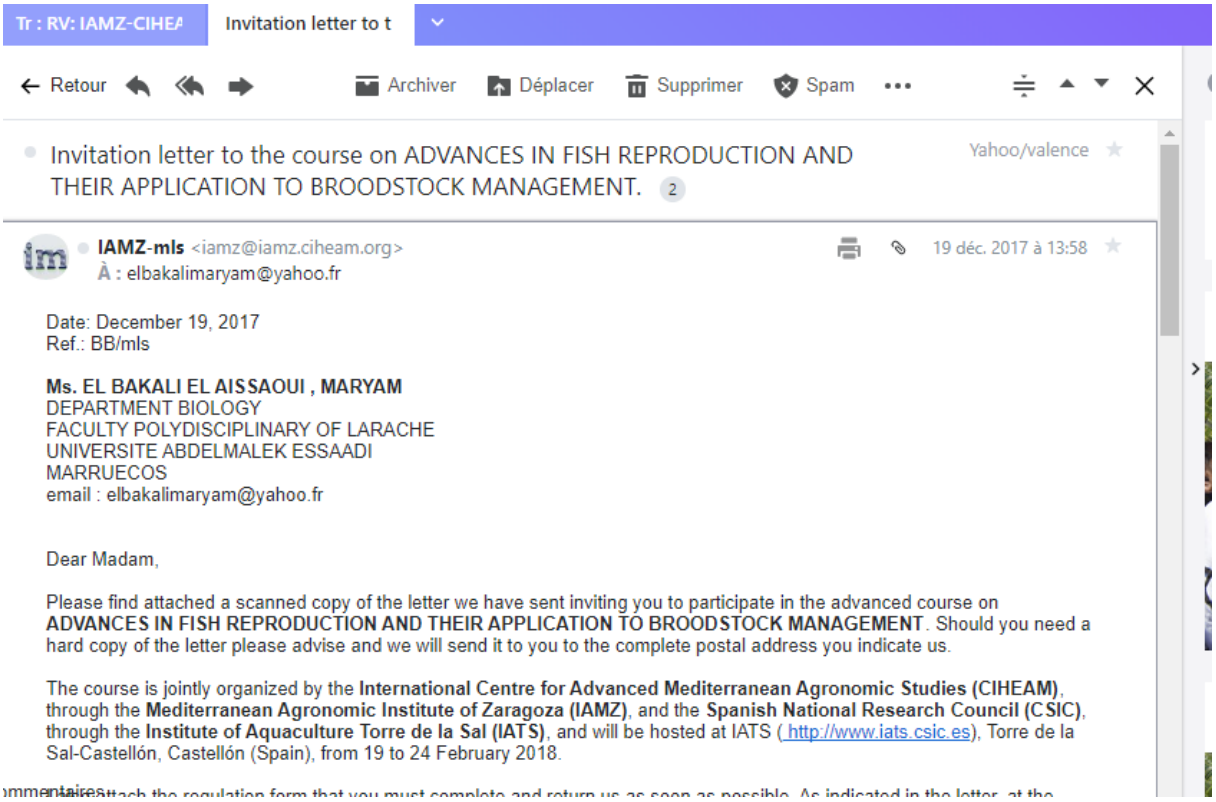
	and sustainable aquaculture technologies (integrated aquaculture, multi trophic aquaculture, aquaponie…), Aquaculture and development.
Teaching methods	Lectures, workshops, seminars, field and laboratory exercises, minor projects presentation.
Knowledge required	Scientific knowledge on biology and ecology
Skills required	Be able to: apply scientific knowledge relative to sustainable aquaculture practices in order to keep food safety, acquire and extend the knowledge and expertise to develop environmental assessment strategies, management systems and regulation frameworks for the aquaculture industry, plan, manage and evaluate aquaculture development projects,
Type of evaluation *(Select one or more boxes)*	☒Oral ☒Written ☒Other : minor projects presentations

To enhance my knowledge and develop my competence regarding this project's module, I will participate in the advanced course on Advances in fish reproduction and their application to broodstock management which is jointly organized by the international center for advanced Mediterranean agronomic studies (CIHEAM) through the Mediterranean agronomic institute of Zaragoza (IAMZ), and the spanish national research council (CSIC), through the institute of aquaculture Torre de la Sal (IATS) (Castellon, Spain), from 19 to 24 February 2018 .



Tr : RV: IAMZ-CIHEA Invitation letter to t

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Invitation letter to the course on ADVANCES IN FISH REPRODUCTION AND THEIR APPLICATION TO BROODSTOCK MANAGEMENT. 2

Yahoo/valence

IAMZ-mls <iamz@iamz.ciheam.org>
À : elbakalimaryam@yahoo.fr

19 déc. 2017 à 13:58

Date: December 19, 2017
Ref.: BB/mls

Ms. EL BAKALI EL AISSAOUI , MARYAM
DEPARTMENT BIOLOGY
FACULTY POLYDISCIPLINARY OF LARACHE
UNIVERSITE ABDELMALEK ESSAADI
MARRUECOS
email : elbakalimaryam@yahoo.fr

Dear Madam,

Please find attached a scanned copy of the letter we have sent inviting you to participate in the advanced course on **ADVANCES IN FISH REPRODUCTION AND THEIR APPLICATION TO BROODSTOCK MANAGEMENT**. Should you need a hard copy of the letter please advise and we will send it to you to the complete postal address you indicate us.

The course is jointly organized by the **International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)**, through the **Mediterranean Agronomic Institute of Zaragoza (IAMZ)**, and the **Spanish National Research Council (CSIC)**, through the **Institute of Aquaculture Torre de la Sal (IATS)**, and will be hosted at IATS (http://www.iats.csic.es), Torre de la Sal-Castellón, Castellón (Spain), from 19 to 24 February 2018.

Commentaires Attach the regulation form that you must complete and return us as soon as possible. As indicated in the letter, at the

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ScolaMAR

Erasmus+ Capacity building

Advanced Course

ADVANCES IN FISH REPRODUCTION AND THEIR APPLICATION TO BROODSTOCK MANAGEMENT

Torre de la Sal-Castellón (Spain), 19-24 February 2018

Please display on a notice board if possible

1. Objective of the course

As in many other parts of the world, fish farming is expanding rapidly in the Mediterranean, where for certain species, particularly trout, sea bream, sea bass, tilapia, carp and mullet, aquaculture already makes up most of the production. The development of intensive culture is conditioned by the control of reproduction and broodstock management, thus facilitating permanent supply of constant and optimum quality fry, so as to permit large-scale culture up to market size.

The objective of the course is to provide professionals with an updated vision of the scientific bases and of the progress made in fish reproduction and to demonstrate its practical application to broodstock management.

The programme revises the most recent advances in the study of regulation and control of reproductive fish processes and in the internal and external factors controlling and modulating reproduction. The environmental, hormonal, molecular, behavioural and stress factors, and genetic instruments currently available for an effective control of all these reproductive processes will be presented, including cryoconservation of gametes.

The applied part of the programme will comprise broodstock handling, including anaesthetics, biometry, ovarian biopsies, markers, blood sampling, slaughter and organ extraction. In vivo techniques will be applied to diagnose the state of maturation of broodstock. The quality of eggs and sperm produced will be evaluated as well as the incubation systems used. Trials will be conducted for the hormonal induction of spawning and of artificial fertilization as well as induction of triploidy and gynogenesis. Sperm freezing and thawing techniques will also be applied.

Upon completion of the course, participants will have gained:

- Knowledge of the scientific bases of the reproduction processes of fish kept in captivity for culture purposes.
- Practice in the appropriate application of available technology in the evaluation and handling of broodstock in intensive aquaculture management.
- Experience in the organization, management and control of broodstock, with special emphasis on how these activities influence the physiological processes and life cycle requirements.

2. Organization

The course is jointly organized by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (IAMZ), and the Spanish National Research Council (CSIC), through the Institute of Aquaculture Torre de la Sal (IATS).

The course will take place at the IATS, Castellón, with well qualified lecturers from research centres and universities in different countries.

The course will be held over a period of 1 week, from 19 to 24 February 2018, in morning and afternoon sessions.

3. Admission

The course is designed for a maximum of 25 professionals with a university degree who are already directly involved in the subject matter of the course.

The course will be given in English.

4. Registration

Candidates can apply online at the following address:
http://www.admission.iamz.ciheam.org/en/

Applications must include the *curriculum vitae* and copy of the supporting documents most related to the subject of the course.

The deadline for the submission of applications is 30 November 2017.

Applications from those candidates requiring authorization to attend the course, may be accepted provisionally.

Registration fees for the course amount to 500 euro. This sum covers tuition fees only.

5. Scholarships

Candidates from CIHEAM member countries (Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia and Turkey) may apply for scholarships covering registration fees, and for scholarships covering the cost of travel and full board accommodation during the course.

Candidates from other countries who require financial support should apply directly to other national or international institutions.

Instituto Agronómico Mediterráneo de Zaragoza
Avenida de Montañana 1005, 50059 Zaragoza, Spain

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ScolaMAR
Erasmus+ Capacity building

6. Insurance

It is compulsory for participants to have medical insurance valid for Spain. Proof of insurance cover must be given at the beginning of the course. Those who so wish may participate in a collective insurance policy taken out by the Organization, upon payment of the stipulated sum.

7. Teaching organization

The course requires personal work and interaction among participants and with lecturers. The international characteristics of the course favour the exchange of experiences and points of view. Formal lectures are complemented by a wide programme of practicals on the various topics addressed during the course and two technical visits to IATS facilities and a fish hatchery.

8. Programme

1. Regulation and control of reproductive processes (8 hours)
   - 1.1. Neuroendocrine mechanisms in fish reproduction
     - 1.1.1 Organization of the hypothalamus-hypophysis complex in teleosts
     - 1.1.2. Main factors influencing hypophysis gonadotropic activity: GnRH, dopamine, kisspeptins, GnIH
   - 1.2. The hormonal control of gonadal development
     - 1.2.1 Fish gonadotropins: structure and function
     - 1.2.2. Gametogenesis and its hormonal control
     - 1.2.3. Biotechnological approaches to study reproduction in teleost fish
   - 1.3. Reproductive dysfunctions and hormonal induction of ovulation, spermiation and spawning
     - 1.3.1. Aquaculture diversification and reproduction constraints
     - 1.3.2. Gonad maturation
     - 1.3.3. Dysfunctions in captivity
     - 1.3.4. Hormonal induction of spawning
   - 1.4. Sex control in fish
     - 1.4.1. Sexual determination and differentiation in fish
     - 1.4.2. Genetic and endocrine sex control and its applications in aquaculture
     - 1.4.3. Epigenetics of sex determination and differentiation
2. Internal and external factors controlling and modulating reproduction (9 hours)
   - 2.1. Broodstock genetics and breeding programmes
   - 2.2. Behavioural factors affecting reproduction
   - 2.3. Environmental control of fish reproduction
     - 2.3.1. Photothermic control of the reproductive cycles in teleosts
     - 2.3.2. Environmental control of puberty and sexual maturation in sea bass
   - 2.4. Influence of stress and of the immune system on fish reproduction
     - 2.4.1. The physiology of stress in fish
     - 2.4.2. Effects of stress on fish reproduction
   - 2.5. Broodstock nutrition and spawning quality
     - 2.5.1. Broodstock nutrition regarding egg and larva quality
     - 2.5.2. Determinant factors and markers for egg quality
3. Cryobanking genetic resources in aquaculture: issues and applications (2 hours)
   - 3.1. Cryoconservation methods for gametes, embryos and cells
   - 3.2. Use of cryopreserved genetic resources in aquaculture
4. Seminar on broodstock management (1 hour)
5. Practicals (18 hours)
   - 5.1. Introduction and presentation of practicals
   - 5.2. Broodstock management
     - 5.2.1. Induction of spawning and artificial fertilization
     - 5.2.2. Determination of egg quality and spawning performance
   - 5.3. Sampling procedures
   - 5.4. Evaluation of sperm quality
   - 5.5. Cryoconservation of sperm
   - 5.6. Hormonal treatments for sex reversal
   - 5.7. Chromosome set manipulations
     - 5.7.1. Induction of triploidy
     - 5.7.2. Inactivation of DNA sperm by UV-light
     - 5.7.3. Induction of gynogenesis using UV-light and by cold shock
   - 5.8. Methods of verification of the ploidy
     - 5.8.1. Preparation of metaphasic chromosomes
     - 5.8.2. Silver stain of NOR regions
     - 5.8.3. Erythrocyte measurements
     - 5.8.4. Use of molecular markers for identification of fish with uniparental inheritance
   - 5.9. Discussion of results
6. Technical visits (3 hours)
   - 6.1. IATS facilities
   - 6.2. Visit to a marine fish hatchery

GUEST LECTURERS

M. BLÁZQUEZ, CSIC-ICM, Barcelona (Spain)
N. DUNCAN, IRTA, San Carles de la Ràpita (Spain)
A. FELIP, CSIC-IATS, Castellón (Spain)
A. GARCIA-AYALA, Univ. Murcia (Spain)
A. GÓMEZ, CSIC-IATS, Castellón (Spain)
M.P. HERRÁEZ, Univ. León (Spain)
M. IZQUIERDO, Univ. Las Palmas de Gran Canaria (Spain)
B. LEVAVI, Hebrew Univ. of Jerusalem (Israel)
H. MIGAUD, Univ. Stirling (UK)
C. MYLONAS, HCMR, Heraklion (Greece)
F. PIFERRER, CSIC-ICM, Barcelona (Spain)
M. VANDEPUTTE, INRA-Ifremer, Palavas (France)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[26/11/2017]** till **[09/12/2017]**
Duration (days) – excluding travel days: …14……

The Staff Member

Last name (s)	AIT FORA	First name (s)	Abderrahman
Nationality	MORROCO	Academic Year	2020… - 2021…
Position	professor		
E-mail address	aitforaa@gmail.com		

The sending university

Name	University IBN TOFAIL
Faculty/Department	Faculty of sciences Departement of geology
Address	Campus universitaire BP242 14000 kenitra MAROC
Country	Morroco

Contact person

First/Last name(s)	Ait fora Abderramman
Position	professor

The receiving university

Name	University of Bretagne occidentale
Faculty/Department	Institut europeen de la mer
Address	Rue des Archives 3 ,PO BOX CS 93837 F-29238 BREST
Country	FRANCE

Contact person

First/Last name(s)	Christophe Delacourt
Position	professor

Type of mobility

☐ Technical skills
☐x Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Building knowledge in the field of remote sensing and GIS
acquiring new approaches to academic education at the Master level
To see closely the scientific research axes of the UBO Sea Sciences team and to discuss the opportunities for collaboration

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	27/11/2017	Arrival in Brest Participation in the professional day Master Sciences of the sea and coastal atelier "Career Paths of Earth, planets and environment sciences ...
2	28/11/2017	TD GIS Master 1 year with SYLVAIN BERMEL (IFREMER) CD GIS Master 2 year with Cristophe DELACOURT
3	29/11/2017	Home at LGO Presentation of the UMR 6538 Visit the PLB Meeting with Christophe Delacourt and discussion of the research axes
4	30/11/2017	Home at UBO
5	01/12/2017	Coastal instrumentation Thesis Defense of Clément Lambert Paleoenvironmental Signature of the Holocene sequences en Rade de Brest: climate and anthropogenic forcing
6	04/12/2017	TD GIS Master 1 year with Marion Jaud
7	05/12/2017	Conferencing SCOLAMAR Project GIS Christophe Delacourt
8	06/12/2017	TD GIS Master 1 year with Marion Jaud
9 **10**	07/12/2017 08/12/2017	TD GIS Master 1 year with Marion Jaud Informatique- GIS Christophe Delacourt

Add lines to the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

The stay m allowed to see the organization of the teachings of the Master sciences of Sea and littoral and to follow the sessions of directed works and lectures in GIS and oceanography. I also trained in manipulating the QGIS software very convenient for spatial analysis and data integration ...

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

The exercises related to the bathymetric analysis and the Qgis software tutorial were distributed to the Master exploration Engineering students of our geology department at Kenitra. I have outlined a summary of my stay and the results of my contacts to the researchers of our laboratory. The exercises related to the bathymetric analysis and the Qgis software tutorial were distributed to the Master exploration Engineering students of our geology department at Kenitra. I have outlined a summary of my stay and the results of my contacts to the researchers of our laboratory

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	REMOTE SENSING TECHNIQUES FOR THE DIAGNOSIS AND MONITORING OF THE COASTAL ENVIRONMENT
Thematic(s)	GEOMATIC
Type of module *(Select one or more boxes)*	x☐ Lecture course x☐ Tutorial exercice ☐ Practical exercice x☐ Group workshop ☐ Field trip ☐ Other – precise:

Teaching manager	AIT FOR A ABDERRAHMAN
Speakers *(Precise if external speakers)*	

Year / Semester	2020/2021
Number of hours	48
Number of groups	4

Objectives	ACQUIRING THE NOTIONS OF REMOTE SENSING (AERIAL PHOTOGRAPHY, DIGITAL IMAGE) TO DESCRIBE, ANALYZE, TRACK AND MANAGE THE LITTORAL ENVIRONMENT
Content	-INTRODUCTION AND HISTORY OF REMOTE SENSING -ELECTROMAGNETIC RADIATION -SPECTRAL SIGNATURES -THE ATMOSPHERE: EFFECTS AND CORRECTIONS -RADAR IMAGERY -SATELLITE TYPES AND ARCHITECTURE -ORBITOGRAPHY -IMAGE PROCESSING -DATA MODELING AND INTEGRATION IN GIS -STUDY OF APPLICATION CASES
Teaching methods	EXPOSED BY STUDENTS AND COURSES
Knowledge required	LICENSE IN GEOSCIENSES
Skills required	COMPUTER SKILLS
Equipment required	ERDAS OR ENVI SOFTWARE ROOMS WITH COMPUTERS

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Type of evaluation *(Select one or more boxes)*	☐ Oral – precise: x☐ Written – precise: ☐ Other – precise:
Comments on evaluations *(Precisions on criteria)*	Course Knowledge control Report on practical work

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[03/décembre/2017]** till **[15/décembre/2017]**
Duration (days) – excluding travel days: **13**

The Staff Member

Last name (s)	SALHI	First name (s)	FOUAD
Nationality	MAROCAINE	Academic Year	2017 - 2018
Position	Enseignant Chercheur /PH		
E-mail address	salhifouad@yahoo.fr		

The sending university

Name	Université Chouaib Doukkali
Faculty/Department	Faculté des Sciences/ Département de Géologie
Address	BP 20, 24000 El Jadida, MAROC
Country	Maroc

Contact person

First/Last name(s)	BENDAHHOU ZOURARAH
Position	Enseignant Chercheur/PES

The receiving university

Name	Université de Bretagne Occidentale (UBO)
Faculty/Department	Institut Universitaire des Etude de la Mer (IUEM)/Géographie
Address	UBO-IUEM, Rue Dumont d'Urville 29280, Plouzané, Brest.
Country	France

Contact person

First/Last name(s)	Iwan Le Berre
Position	Enseignant Chercheur

Type of mobility

☐ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

L'objectif principal de ma mobilité dans le cadre du programme Scolamar, était d'effectuer un stage d'observation sur les méthodes pédagogiques pratiquées pour les étudiants du master EGEL M1 et M2 domicilié au **Département de Géographie** de l'IUEM (Laboratoire LETG) ; Aussi de voir la possibilité d'appliquer certaines de ces méthodes pour le module que je compte enseigner dans le cadre d'un Master qui sera monté conjointement par plusieurs universités marocaines dont la nôtre : Université Chouaib Doukkali, Facultés des Sciences, **Département de Géologie**, El Jadida.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	Dimanche **3**/12/2017	Départ vers Brest, France
2	Lundi **4**/12/2017	Matin – 09h Réception et visite du Laboratoire LETG Soir – 19h *UBO – UFR Lettres (20 rue Duquesne, 29200 Brest)* **Brest et les énergies renouvelables : Quelles perspectives de développement économique ?**
3	Mardi **5**/12/2017	Matin (9-12H) salle B016 Master 1 EGEL – Cours Magistral : Fonctionnement **des écosystèmes côtiers** (JF Maguer) Après-midi (16h) – Salle réunion LETG **présentation de Katja Laute sur les falaises bretonnes**
4	Mercredi **6**/12/2017	Soir – 18h30 Rencontre avec les géologues (Jacques Déverchère, David Graindorge, etc.)
5	Jeudi **7**/12/2017	Matin (9-12H) salle B014 Master 1 Gestion de l'Environnement (EGEL) – Travaux dirigés **Fonctionnement des écosystèmes côtiers** (M. Waeles) Après-midi (14h17h) Master STPE, Sciences de la Terre – Cours Magistral **Sismique marine** (D. Graindorge)
6	Vendredi **8**/12/2017	Matin (9-12H) salle B014 Master 1 Gestion de l'Environnement (EGEL) – Travaux dirigés **Fonctionnement des écosystèmes côtiers** (M. Waeles)
7	Samedi **9**/12/2017	Journée libre
8	Dimanche**10**/12/2017	Visite de la zone littorale de Brest au Conquêt (I. Le Berre)

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9	Lundi **11/**12/2017	Matin (10h-12h30) : Inauguration officielle de la résidence Internationale Nelson Mandela Après-midi (13h30-18h) salle B016 Master 1 EGEL - **Diagnostic de territoire : soutenances** Soirée – 20h *UBO – UFR Lettres (20 rue Duquesne, 29200 Brest)* **Seatoyens. La participation du public aux projets littoraux : une nécessité, un défi à relever**
10	Mardi **12/**12/2017	**Journée scientifique du SHOM**
11	Mercredi **13/**12/2017	Après-Midi (13h-17h): conférence sur **le rôle d'un gestionnaire des Aires Marines Protégées (AMR) vis-à-vis d'un projet industriel en mer : cas des énergies marines renouvelables (EMR). (Sylvain Michel)** Matin (9-12h) Master 1 EGEL - **Fonctionnement des écosystèmes côtiers (A. Menesguen)**
12	Jeudi **14/**12/2017	Matin (9-12h) Master 1 EGEL **Fonctionnement des écosystèmes côtiers – restitution Groupe 1**
13	Vendredi **15/**12/2017	Retour vers le Maroc

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

La méthode utilisée pour l'enseignement au niveau du master EGEL, pour un cours magistral, se base sur un exposer fondamental en premier lieu et passe par la suite à l'étude de cas concrets, où les étudiants doivent traiter les données fournis par l'enseignant, faire ressortir les constatations pertinentes et faire une recherche bibliographique sur le web, pour expliquer les différentes anomalies qu'ils ont pu déceler. (cf. Annexe)
Un autre aspect dans l'enseignement au sein du même Master et qui parait être d'une importance primordiale; sont les tables rondes réalisées par les étudiants de M2. A ces dernières, sont invités les différents acteurs de société s'intéressant à une thématique bien déterminée pour débattre des avantages et inconvénients de celle-ci.
Cette méthode peut être appliquée dans le module "Environnements littoraux" que nous comptons dispenser dans le cadre d'un Master.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Un rapport détaillé sera envoyé au responsable de Scolamar au niveau de notre université.

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ANNEXES

STAGE D'OBSERVATION SCOLAMAR 2017

RAPPORT JOURNALIER

Dimanche 03/12/2017

- Départ vers la France (Brest) ; accueilli à l'aéroport par Pr. Iwan Le Berre

Lundi 04/12/2017

Matin :

- Visite du Laboratoire LETG.
- Présentation orale de l'architecture du Master expertise de gestion de l'environnement littoral (EGEL) par le Pr Iwan Le Berre.
- La majorité des cours sont fait par les étudiants eux même encadrés par les enseignants.
- Le nombre d'étudiants est entre 20 et 25.

Après-midi :

- Assistance au TD animé par le Pr Iwan Le Berre : Diagnostic territorial en SIG (Encadrement des étudiants) : Ils ont réalisé des cartes d'occupation du sol conjuguées avec différentes informations et ceci sur plusieurs dates (Ex : artificialisation 1977 et artificialisation 2016 en utilisant des coefficients) et réaliser la différence entre les deux dates (voir tableau) :

Artificialisation 1977	Artificialisation 2016	Art 1977 - Art 2016
1	2	-1 artif ↗
2	2	0
3	2	1 artif ↘

- Rencontre avec Catherine Meurferec Directrice de l'Ecole Doctorale Sciences de la mer et du littoral.

Soir à partir de 20h:

- UBO-UFR Lettres : Table ronde ; "Brest et les Energies Marines Renouvelables : quelles perspectives de développement économique?". Cette table ronde consacrée aux EMR, s'articule autour du rôle de Brest en tant que moteur de développement de ces énergies et du rôle que les EMR ont à jouer dans le développement dans ces territoires. L'idée est aussi de parler de l'extension actuelle du port de Brest et de voir comment il s'inscrit dans une perspective de développement économique et industriel, avec la volonté affichée de la région Bretagne de réduire la dépendance énergétique. Après un exposé sur les EMR

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présenté par les étudiants M2 du Master EGEL ; une discussion animée par ceux-là même en présence d'un certain nombre de personnalité s'intéressant aux EMR : Alain MASSON, 1er vice-président de Brest Métropole ; Jean-François DAVIAU, président de SABELLA SAS ; Kelly CAYOCCA, Responsable opérations et qualité à France Energie Marines ; Antoine CARLIER chercheur à l'IFREMER ; Carl BOIS Directeur commercial de Quiet Oceans et Jean-Frédéric CHARPENTIER Enseignant Chercheur Senior à l'Ecole Navale.

Mardi 04/12/2017

- Suivi d'un cours magistral sur le fonctionnement des écosystèmes côtiers, animé par le Pr J.F. Maguer.
  Le cours se scinde en trois parties ; la 1ère partie est consacrée à l'explication des phénomènes rencontrés au niveau de la plateforme selon différentes situation, dans l'interaction entre la lumière, les sels nutritifs et le phytoplancton ainsi que leurs répartitions dans la colonne d'eau en fonction des saisons (Hiver, printemps, été et automne).
  La 2ème partie est axée sur la présentation de cas concret existant dans la bibliographie ; pris comme exemple Plymouth (colonne d'eau stratifiée) et Brest (colonne d'eau brassée). Ceci a été suivi par le fonctionnement de l'écosystème en front de marée. En fin de cette partie, des exercices explicatifs ont été donnés aux étudiants.
  La 3ème partie était consacrée au bilan de la séance en récapitulant les lignes importantes du cours et faire un aperçu sur l'environnement limite entre la plateforme et le talus continental accompagné d'explications des différentes chaînes alimentaires.
- Réunion de fin d'année du laboratoire LETG, suivi d'une présentation de **Katja Laute** Relatif à l'effet de la houle sur l'érosion des falaises des côtes bretonnes.

Mercredi 06/12/2017 :

- Réunion conviviale avec Catherine Meurferec Directrice de l'Ecole Doctorale Sciences de la mer et du littoral et les géologues de l'IUEM , David Graindorge et Jacques Dèverchére, ainsi que Justine Roddier.

Jeudi 07/12/2017 :

- Matin (9h-12h): TD Fonctionnement des écosystèmes côtiers animé par M. Waeles au profit

des étudiants Master 1 Gestion de l'environnement (EGEL).

Le TD se scinde en deux parties :

1- Un topo sur l'anoxie en mer baltique : origine et facteurs de contrôle des teneurs en oxygène dissout ; données issues d'un institut suédois. Données recueillis avec une fréquence mensuelle ; l'eau profonde s'appauvrie en oxygène, problème qui s'est aggravé à la fin du 20ème siècle. Puis passage pour expliquer les propriétés de quelques éléments chimiques toxiques tel qu'Hg et Sn (volatil et soluble).

2- Il a été donné aux étudiants deux fichiers Excel, un relatif à la mer baltique, l'autre à la côte atlantique française dans lesquels il y a des données d'analyse chimique des sédiments superficiels concernant les éléments métalliques, en ayant des teneurs de références. Les étudiants doivent fournir des graphiques des teneurs de chaque élément en fonction de la profondeur.

- Après-midi (14h-17h) : Cours magistral au profit des étudiants du Master STPE, Science de la terre : Sismique Marine animé par D. Graindorge. Le cours se fait sous forme d'exercices (distribué aux étudiants sous forme de planches), les étudiants doivent déduire une formule et l'appliquer à différents exemples donnés.

  Un profil de sismique réflexion, leur a été distribué, à partir du quel doivent répondre à un certain nombre de questions (simulation d'examen).

Vendredi 08/12/2017 :

- Matin (9h-12h) : TD Fonctionnement des écosystèmes côtiers animé par Mattieu Waeles au profit des étudiants Master 1 Gestion de l'environnement (EGEL), suite.

  Les étudiants doivent choisir quelques éléments métalliques pour voir leurs évolutions (si contamination il y a ou pas). Les étudiants traitent les données sous forme de graphiques et l'enseignant passe pour vérification. Ils essayent de repérer les zones contaminées et essayent de trouver les causes : recherche sur internet les cause de cette contamination (webographie).

  Il y a deux groupes d'étudiants ; un qui s'occupe de la mer baltique et l'autre de la côte atlantique française.

  Les groupes d'étudiants doivent restituer le résultat de leurs travaux sous forme d'exposé d'environ 20min chacun suivi de discussion entre étudiants et quelques questions de la part de l'enseignant.

Lundi 11/12/2017 :

- Matin (10h-12h30) : Inauguration officielle de la résidence Internationale Nelson Mandela en présence de Monsieur Le Maire de Brest. Présentation de la résidence par l'architecte qui l'a conçu. Visite de quelques studios et plateau de bureau.
- Après-midi (14h-17h) : Restitution par les étudiants des travaux sur le diagnostic des écosystèmes côtiers :

  5 groupes de 4 à 5 étudiants se sont relayés pour présenter leurs travaux relatifs aux diagnostiques des écosystèmes côtiers. Chaque groupe doit trouver une problématique à traiter. Ils ont présenté également une vidéo sous forme de reportage relatif à la problématique choisie de la localité sur laquelle ils ont travaillé.

- Soir à partir de 20h : Table ronde seatoyens : "La participation du public aux grands projets

littoraux : Une nécessité, un défi à relever". L'objet de cette table ronde est d'engager une réflexion quant à la place du citoyen en mer et plus spécifiquement sur la caractérisation de la participation du public aux projets littoraux en ce qui concerne l'environnement. Elle a été organisée par les étudiants M2 du Master EGEL (Expertise et Gestion de l'Environnement Littoral) en présence de : Anne ROGNANT, Concervateur-chargée de la médiation scientifique et culturelle à Océanopolis ; Julien FUCHS, responsable scientifique du groupe de recherche sur les territoires du sport (GRITS) de l'UBO ; Yves JULLIEN, Conseil de Brest Métropole Animateur "Rade de Brest" ; Michel CLECH, Co-président du Réseau d'Education à l'Environnement de Bretagne (REEB) ; Betty QUEFFELEC, Maître de conférences en droit public à l'UBO et Georges TORILLAC, président de l'amicale des plaisanciers des marinas de Brest.

Mardi 12/12/2017 :

- Journée de l'Information Scientifique et technique ; organisée par le Service Hydrographique et Océanographique de la Marine (SHOM), sous le thème : Observer et modéliser l'environnement côtier. Ladite Journée s'est déroulée sous formes de communications orales et posters traitant de différents aspects scientifiques des domaines côtiers français (Atlantique, méditerranée et outre-mer).

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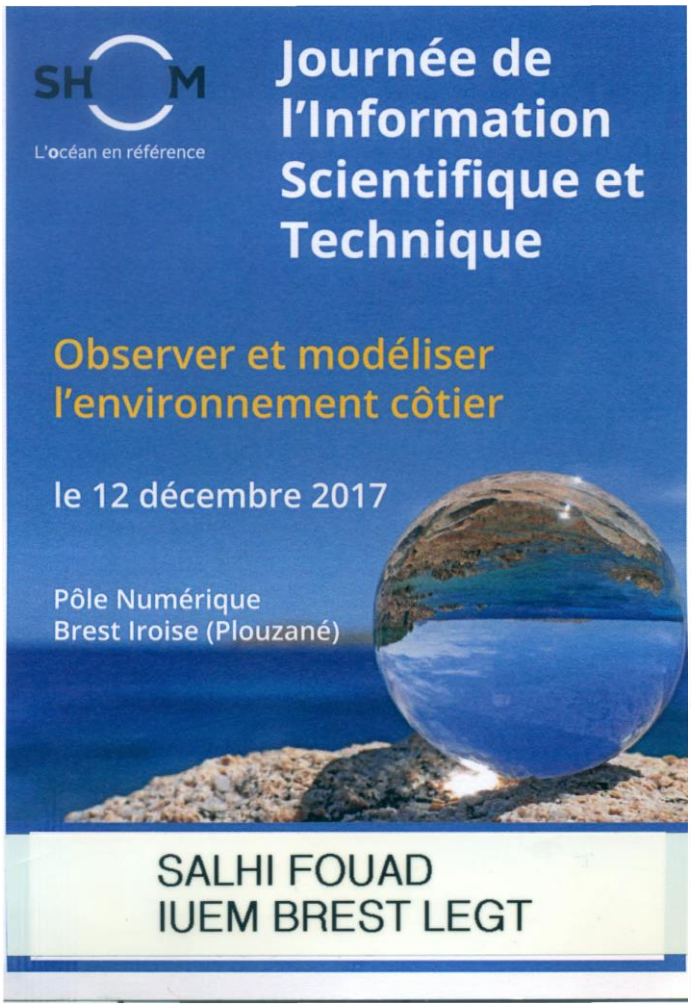

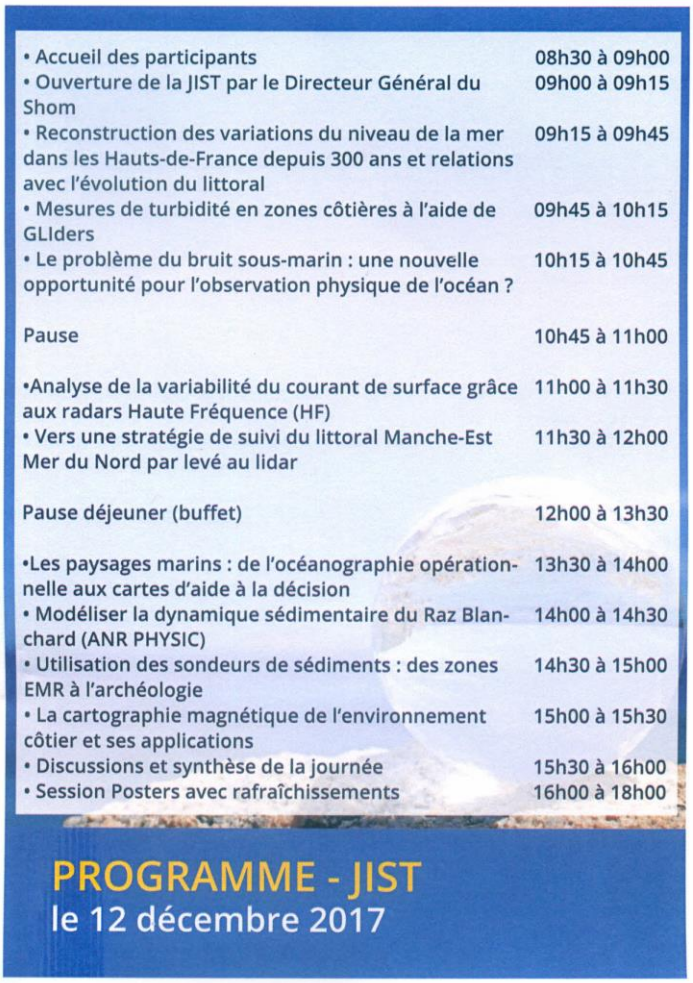

Mercredi 13/12/2017 :

- Matin : Cours dispensé en faveur des étudiants M1 du master EGEL, par le Pr. Alain MENESGUEM, sur la dégradation de la qualité d'eau douce et d'eau de mer. Ce cours traite de trois axes principaux : La cause de l'eutrophisation, comment surveiller l'eutrophisation et remédiation des dérives créées par l'eutrophisation.
- Après-Midi : conférence sur le rôle d'un gestionnaire des Aires Marines Protégées (AMR) vis-à-vis d'un projet industriel en mer : cas des énergies marines renouvelables (EMR).
  - Programme d'acquisition des connaissances de l'agence AMP vis-à-vis des EMR,
  - Comptabilité des AMP et EMR : Ex : Parc éolien de la baie de Saint Brieuc et ferme pilote d'hydroliennes.
  - Compensation écologique en milieu marin,
  - Hiérarchisation des enjeux écologiques en milieu marin (il y a eu expérimentation d'aire d'essai avec retour d'expérience).

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Jeudi 14/12/2017

- Fonctionnement des écosystèmes côtiers : restitution des travaux par les étudiants sous forme de rapports et présentations orales. Des sujets ont été confiés aux étudiants (répartis en groupes de 3 et 4 étudiants) avec leurs jeux de données, qu'ils devaient étudier et comparer leurs résultats avec les travaux des chercheurs réalisés dans les zones correspondantes.
- Les présentations sont les suivants :
  - Contamination des sédiments de la façade atlantique française en éléments métalliques.
  - Bloom de phytoplancton *Gyrodinium* dans la baie de Douarnez en 1983.
  - Evaluation de la situation d'anoxie en mer Baltique.
  - Les conditions de développement d'*Alexandrium Minutum* dans l'estuaire de la Penzé.

Vendredi 15/12/2017 : Retour vers le Maroc.

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	
Thematic(s)	
Type of module *(Select one or more boxes)*	☒ Lecture course ☐ Tutorial exercice ☒ Practical exercice ☐ Group workshop ☒ Field trip ☐ Other – precise:

Teaching manager	SALHI FOUAD
Speakers *(Precise if external speakers)*	BENDAHHOU ZOURARAH KHALID EL KHALIDI SALHI FOUAD

Year / Semester	MASTER M1 / SEMESTER 2
Number of hours	48 HEURES
Number of groups	

Objectives	CE MODULE EST UNE INTRODUCTION GENERALE A LA GEOMORPHOLOGIE ET LA SEDIMENTATION DANS LES ENVIRONNEMENTS LITTORAUX. IL MET L'ACCENT SUR LE COMPORTEMENT DES SEDIMENTS (RHEOLOGIE) AU NIVEAU DES RIVAGES SABLEUX, ROCHEUX ET CAILLOUTEUX AINSI QU'AU NIVEAU DES ESTUAIRES ET DELTAS. CECI AIDERA A MIEUX COMPRENDRE L'EVOLUTION GEOMORPHOLOGIQUE ET DES CONDITIONS HYDRODYNAMIQUES DES COTES ET DES ZONES DE TRANSITION.

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Content	**INTRODUCTION GENERALE** A- LE DOMAINE COTIER DEFINITION ET CLASSIFICATION COTE SABLEUSE GEOMORPHOLOGIE DES COTES SABLEUSE DYNAMIQUES DES PLAGES ET TRANSPORT DES SEDIMENTS LES DUNES DE PLAGE LES SEQUENCES VERTICALES DES SABLES DE PLAGE B- L'ENVIRONNEMENT ESTUARIEN INFORMATION GENERALE CLASSIFICATION ET HYDROGRAPHIE DES ESTUAIRES SEDIMENTATION ET BIOTURBATION C- ENVIRONNEMENT DELTAÏQUE INFORMATION GENERALE STRUCTURE DE DELTA LES UNITES PHYSIOGRAPHIQUES DU DELTA - LA PLAINE DELTAÏQUE - LE FRONT DELTA - LE PRODELTA DEVELOPPEMENT REPETITIF DES SEQUENCES LATERALES ET VERTICALES DANS UN SYSTEME DELTAÏQUE **LES TRAVAUX PRATIQUES :** IL S'AGIT DE : - TRAITER PLUSIEURS DONNEES LITTORALES, ET/OU DE TRAITEMENT DE DONNEES - REALISER DES PROFILS DE PLAGES ET SUIVRE L'EVOLUTION SUR UNE ANNEE ET PLUS SELON LES DONNEES EXISTANTES
Teaching methods	- COURS MAGISTRAL - ACTIVITES PRATIQUES (SORTIES DE TERRAIN) - TRAVAUX PRATIQUES
Knowledge required	ELEMENTS BASIQUES EN SEDIMENTOLOGIE
Skills required	LICENCE FILIERES STU, SVI
Equipment required	- DGPS STATION TOTALE - SCANNER A0 - COLONNE DE TAMIS - SEDIGRAPHE ET/OU SEDIMENTOMETRE
Type of evaluation *(Select one or more boxes)*	☒ Oral – precise: Présentation de rapports de sorties ☒ Written – precise: Examen écrit ☐ Other – precise:
Comments on evaluations *(Precisions on criteria)*	Examen fin semestre : 60 %, Examen de TP : 20 %, Rapport de sortie : 20%

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[day/month/year]** till **[day/month/year]**
Duration (days) – excluding travel days: 01/15/18 – 01/19/18

The Staff Member

Last name (s)	TOUAHNI	First name (s)	Raja
Nationality	Morroccan	Academic Year	2017 - 2018
Position	Professor		
E-mail address	Touahni.raja@uit.ac.ma		

The sending university

Name	Ibn Tofail
Faculty/Department	Physics
Address	Campus Universitaire – BP 133, 14000 Kénitra
Country	Morocco

Contact person

First/Last name(s)	AIT FOR A ABDERRAHMAN
Position	Professor

The receiving university

Name	Université de Brest Occidentale (UBO)
Faculty/Department	Institut Universitaire Européen de la Mer (IUEM)
Address	Rue Dumont d'Urville, 29280 Plouzane
Country	France

Contact person

First/Last name(s)	Riwalenn RUAULT
Position	MOOC Flotrisco Prject engineer

Type of mobility

☐ Technical skills
☐ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[01/15/18] till [01/19/18]**
Duration (days) – excluding travel days: 5

The Staff Member

Last name (s)	MESSOUSSI	First name (s)	Rochdi
Nationality	Morroccan	Academic Year	2017 - 2018
Position	Professor		
E-mail address	messoussi@uit.ac.ma		

The sending university

Name	Ibn Tofail
Faculty/Department	Physics
Address	Campus Universitaire – BP 133, 14000 Kénitra
Country	Morocco

Contact person

First/Last name(s)	AIT FOR A ABDERRAHMAN
Position	Professor

The receiving university

Name	Université de Brest Occidentale (UBO)
Faculty/Department	Institut Universitaire Européen de la Mer (IUEM)
Address	Rue Dumont d'Urville, 29280 Plouzane
Country	France

Contact person

First/Last name(s)	Riwalenn RUAULT
Position	MOOC Flotrisco Prject engineer

Type of mobility

☐ Technical skills
☐ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The overall objectives of this mobility is to discuss and prepare in collaboration with colleagues from the IUEM Institute, a kind of draft for the integration of on line courses. The idea here is to enable a sharing of experiences from all partners in the setting of a Master curriculum related to the topic of the sea, offered among Moroccan universities. Hence, courses that are already given at the UBO, may be shared with the Moroccan Master using IT (e-Learning, MOOCs). Furthermore, Moroccan universities professors may share they experiences and courses with students with no need of mobility.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	Monday, January 15th	13h30-16h30: Assist part to a Master degree course at IUEM “Moyenne Echelle Océanique: Instabilités et Turbulence” 16h30: Discussion and adjustment of the program of the week
2	Tuesday, January 16th	9h00-12h00: analyzing of the MOOC *Flotrisco* : what are the possibilities for adaptation to Moroccan context 14h00-18h00: Discovering the Moodle platform features
3	Wednesday, January 17th	9h30-12h15: Assist part to a Master degree course at IUEM “Moyenne Echelle Océanique: Instabilités et Turbulence” 14h00-18h00: starting discussion about the integration of IT’s in the Moroccan project curricula
4	Tuesday, January 18th	10h00-12h00: workshop on “interactive whiteboard” 13h00-15h00: workshop on “smartmaker”
5	Friday, January 18th	9h00-12h00: scenarisation of a SPOC 14h00-17h00: technical tools for video editing

Add lines to the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

As our mobility was dedicated to the integration of IT's in this project, it is a transversal approach that concerns all the university partners. The benefit of this mobility should help to set up a common Master degree.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

We plan to assist courses connectors to adapt courses for distance needs (elearning, MOOCS, …)

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[day/month/year]** till **[day/month/year]**
Duration (days) – excluding travel days: …12……

The Staff Member

Last name (s)	AMMAR	First name (s)	Abdellah
Nationality	Moroccan	AcademicYear	2017 - 2018
Position	Professor		
E-mail address	siadamammar@yahoo.fr		

The sending university

Name	Université Mohammed V
Faculty/Department	Faculté des Sciences
Address	Avenue Ibn Battouta, BP1014, Département des Sciences de la Terre Fac. Sciences –Rabat, Morocco
Country	Morocco

Contact person

First/Last name(s)	Abdellah AMMAR
Position	Manager

The receiving university

Name	Université de Bretagne Occidentale
Faculty/Department	Geology
Address	
Country	France

Contact person

First/Last name(s)	David Graindorge
Position	Manager

Type of mobility

☐Technical skills
☐Innovative pedagogical approaches X

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The organization of pedagogical activities in the field of marine sciences and the means made available to achieve it.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons,meetings, trainings, conferences, field trips)

Day	Dates	Description
1	12 March 2018	arrival in Brest
2	13 March	-visit the exhibition and attend the conferences organized at the UBO on the occasion of the 40th anniversary of the amoco Cadiz. - Presence at the conference given by Mr Jacques Devercher on tsunamis
3	14 March	visit of laboratories, meetings and discussions with teachers and researchers from Iuem
4	15 March	boarding GEOBREST with MASTER students supervised by Mr GRAINDORGE on the boat “cotes de la manche”: training on seismic methods
5	16 March	2nd day of GEOBREST
6	19 March	Presentation by Mr Deverchère on the Mediterranean margins
7	20 March	excursion with the students of the Master on Metalogeny
8	21 March	Conferences: morning: géodynamic, afternoon: energy resources
9	22 March	bibliographic research exhibited by Master's students Course on Marine geology
	23 March	students evaluation practices

Add lines to the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

Visits to European higher education institutions make it possible to know what is being done, in terms of training, and how it is done. Exchanges with teachers bring a lot to the extent that they allow to know the strengths and aspects that need to be improved.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

oral communication with the ScolaMar team

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **11/11/2018** till **17/11/2018**
Duration (days) – excluding travel days: 5

The Staff Member

Last name (s)	BARAKAT	First name (s)	Amina
Nationality	Moroccan	Academic Year	2018 - 2019
Position	Teacher Researcher		
E-mail address	Barakatamina17@gmail.com		

The sending university

Name	Université Abdelmalek Essaadi Maroc
Faculty/Department	Faculté des Sciences et Techniques de Tanger
Address	Km12, Boukhalef Tanger
Country	Maroc

Contact person

First/Last name(s)	BARAKAT Amina
Position	Teacher Researcher

The receiving university

Name	UBO, Université de Bretagne Occidentale
Faculty/Department	European University Institute of the Sea
Address	
Country	FRANCE

Contact person

First/Last name(s)	Mme Justine Roddier
Position	ScolaMAR project manager

Type of mobility

☐ Technical skills
☐ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The ScolaMAR objective is to develop an Innovative training for Smart Coastal management. To achiev this work, ScolaMAR project programs mobility of Moroccan staff in the European universities of the consortium. The objective of my mobility is to observe marine biological knowledge and to create online contents (MOOC).
The objective university is implementation of an innovative Master program integrating he diversity of disciplines related to the marine sciences and coastal management.
This regional Master's program will allow the Moroccan partner universities o face societal challenges by improving the employability of young adults

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	12/11/2018	Participate in the EU's renditions of Science and Society Framed by Mrs Riwalenn Ruault Project Manager Training and Educational Innovations / Pedagogical engineer European University Institute of the Sea (IUEM-UBO) The EU common to all Master 2 students on the science and society issues in Marine and Littoral Sciences taking curses on line. The challenge is to develop a culture of interdisciplinary, particularly at the human-nature interface, and to raise awareness of the issues at the science-society interface. In this session, the student representatives from each discipline explain their contribution to the understanding of the marine sciences and ask the problems. After each presentation, the teachers gave a presentation on the contribution of the discipline Sciences sea and coastline
2	13/11/2018	Morning: Participation in the restitution of the EU "Sciences and Society": -Discussion with students giving them the opportunity to evaluate this UE and make suggestions -Evaluation on the online part and the present part Afternoon: Attend two workshops that consist of a play and activities in the form of games of society. Students cover topics on the marine environment with multidisciplinary ways. Participation in the evaluation and awarding notes to different groups

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3	14/11/2018	Morning: Work on a content of an online course dealing with the impact of climate change on coastal ecosystems. Framed by Mrs Riwalenn Ruault Project Manager Training and Educational Innovations / Pedagogical engineer European University Institute of the Sea (IUEM-UBO) Afternoon: Meeting with Professor Mohamed Jebbar director of the laboratory of extreme environmental microbiology at the IUEM Technopole Brest-Iroise. -Discussion on the monitoring of the Moroccan micobian ecosystems and the installation of a marine observatory which is a scientific research tool. The Marine Observatory is interested in both coastal and offshore systems, the water column and ocean floor, their chemistry, physics and biology. -Visit the premises of the laboratory and discussions with researchers
4	15/11/2018	Morning: Participation in the course given by Bertha Olivia Arredona Vega. Centro de Investigaciones Biologicas del NoroEste S.C. The course deals Biotechnological applications of microalgae Afternoon: Meeting with Professor Eric Deslandes, University Professor at the University of Western Brittany UBO Laboratory of Marine Environmental Sciences LEMAR UMR 6539 CNRS-UBO-IRD-IFREMER European University Institute of the Sea at Plouzané near Brest He teaches physiology and plant ecophysiology with a specialization in the field of seaweed (phycology). As a researcher, he is interested in the isolation and structural characterization of bioactive natural substances from large algae Brittany marine flora and their valorization in the field of nutrition-health. Visit of the Faculty of Sciences, Research Laboratories, and Practical Works rooms and meetings with teacher researchers and discussions on their research projects.
5	16/11/2018	Meeting with Mrs Claire Hellio vice-president of the European Society for Marine Biotechnology and professor at the University of Bretagne occidentale (IUEM / LEMAR). She works to develop the use of marine biomasses and their development in the fields of antifouling and cosmetics. She runs the bioprospecting platform Biodimar. Presentation of Master Biotechnologies Parcours Master international en biotechnologies marines Master discussion of objectives and opportunities for exchanges and cooperation between the two universities

Add lines to the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

My mobility will bring an added value to my teaching module by:

- Orienting it towards raising students' awareness of the risks of climate change and their impacts
- Approving the technical side of the module
- Developing critical thinking of students
- Designing content for SPOC to extend knowledge….

The university will have a staff trained

- Capable of forming young people for the labor market in the field of coastal risks.
- Able to mount Master programs in the field of marine biology
- who has relations with their European counterparts for more collaborations….

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

The result of my mobility will be disseminated as a report and possibly an internal meeting

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **13/11/2018** till **26/11/2018**
Duration (days) – excluding travel days: 12

The Staff Member

Last name (s)	MHAMMDI	First name (s)	NADIA
Nationality	Moroccan	Academic Year	2018 - 2019
Position	Professeur		
E-mail address	nmhammdif@yahoo.com		

The sending university

Name	Université Mohammed V
Faculty/Department	Institut Scientifique
Address	Avenue Ibn Battota, B.P. 703, Agdal, 10090 Rabat, Maroc
Country	Maroc

Contact person

First/Last name(s)	Ammar Abdellah
Position	Professeur

The receiving university

Name	Université de Bretagne Occidentale
Faculty/Department	Institut Universitaire Européen de la Mer
Address	Technopôle Brest-Iroise, Rue Dumont d'Urville, 29280 Plouzané, France
Country	France

Contact person

First/Last name(s)	Justine Roddier
Position	Project manager

Type of mobility

XTechnical skills
XInnovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Ce stage avait un triple objectif :
- perfectionnement de l'enseignement en Géosciences ;
- réflexion sur les méthodologies et l'évaluation de l'enseignement en géosciences marines ;
- et mise à jour des connaissances.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons,meetings, trainings, conferences, field trips)

Day	Dates	Description
1	14/11/2018	Cours de methods bathymetriques donné par Arnaud Gallait (Ifremer)
2	15/11/2018	Séminaire annuel de direction Geosciences Ifremer
3	16/11/2018	Séminaire annuel de direction Geosciences Ifremer
4	19/11/2018	Journée à la bibliothèque de la Pérouse
5	20/11/2018	KICKOFF MEETING pour le projet FOCUS, porté par Marc- André Gutscher (Directeur du labo géosciences)
6	21/11/2018	Soutenance de thèse de David Dellong (Géosciences marines – Ifremer) "Failles actives et structures profondes de la marge Est-Sicilienne par modélisation de sismique grand-angle".
7	22/11/2018	Discussion avec Marina Rabineau et Daniel Aslanian sur les enseignements en géosciences marines
8	23/11/2018	Présentation et réunion à l'Ifremer Brest pour chercher des voies de collaborations. Discussions avec Nabil Sultan directeur de GM et avec les directeurs des laboratoires de GM.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

Valeur ajoutée à mon module d'enseignement
- de nouvelles façons d'aborder un enseignement, en utilisant les informations accumulées lors de ce séjour
- des approches actuelles de l'enseignement
- Enumérer les obstacles à l'apprentissage et approches pour les surmonter

Pour mon université
- Réfléchir sur les stratégies d'enseignement, de formation et d'apprentissage
- S'inspirer du modèle de l'UBO en terme de Formation et d'organisation
- Le master de l'UBO étant "une source d'inspiration pour les autres Masters " (ScolaMAR, mais aussi d'autres que l'université voudrait mener)

Pour le projet ScolaMAR
- Meilleure enseignement
- Meilleure organisation

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IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Diffusion par **une réunion et un rapport** pour mon institution car il est important de renseigner les décideurs sur la crédibilité et les résultats accessible de ce projet.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[18/11/2018]** till **[01/12/2018]**
Duration (14) – excluding travel days: …12…

The Staff Member

Last name (s)	EL MOUDNIB	First name (s)	LAHCEN
Nationality	MAROCAINE	Academic Year	2018- 2019
Position	ASSISTANT PROFESSOR		
E-mail address	lahcenelmoudnib@gmail.com		

The sending university

Name	MOHAMMED V UNIVERSITY IN RABAT
Faculty/Department	SCIENTIFIC INSTITUTE
Address	Avenue Ibn Batouta, B.P 703, 10106 Rabat
Country	MOROCCO

Contact person

First/Last name(s)	ABDELLAH AMMAR
Position	PROFESSOR

The receiving university

Name	UNIVERSITY OF BRETAGNE OCCIDENTALE
Faculty/Department	EUROPEAN UNIVERSITY INSTITUTE FOR SEA
Address	Technopôle Brest-Iroise Rue Dumont D'urville 29280 Plouzané, Brest.
Country	FRANCE

Contact person

First/Last name(s)	DAVID GRAINDORG
Position	PROFESSOR

Type of mobility

☐ Technical skills
☐ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Our objective during the stay period at the university of Brest are to have a global idea about the course to be prepared in the frame of the master: **Sciences du Littoral: Approche pluridisciplinaire (SLAP)**, and to collect informations by attending some modules in the Master of marine physics (particularly the solid and fuild mechanics, and the fluid dynamics for geophysics) at the IUEM, and disccussing with the scientific researchers in the topic related with the attended modules.
The objectives of Modules related to fluid dynamics are to present the main characteristics and theories describing the flow of air and water on the surface of the globe, describe the effects induced by the Earth's rotation and by the presence of a temperature gradient and provide basic knowledge of the waves encountered in geophysical fluids.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	19/11/2018	Lesson : Numerical Modeling
2	20/11/2018	Lessons : Data Analysis, and Solid Mechanics
3	21/11/2018	Lessons : Fluid Mechanics, and Geophysical Fluid Dynamics
4	22/11/2018	Lessons : Geophysical Fluid Dynamics. Attending Seminar : Thermo-mechanical modeling: Conversation of Physical Properties and Constitutive Relations.
5	23/11/2018	Lessons : Applied Mathematics, Data Analysis
6	24/11/2018	Lesson : Numerical Modeling
7	27/11/2018	Lessons : Data Analysis, and Geophysical Fluid Dynamics
8	28/11/2018	Lessons : Fluid Mechanics.
9	29/11/2018	Lessons : Fluid Mechanics, and Geophysical Fluid Dynamics
10	30/11/2018	Lessons : Applied Mathematics.

Add lines to the table if needed.

ADDED VALUE

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Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

This mobility allows me to bring new experience on the teaching module in the SLAP Master, regarding the fluid dynamics in the geophysical context.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

We will organize an internal meeting after the mobility of all ScholaMAR members of mohammed V university, for assessing the balance of our mobilities in the frame of ScholaMAR project.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[05/12/2018]** till **[14/12/2018]**
Duration (10) – excluding travel days: 9

The Staff Member

Last name (s)	SEFRIOUI	First name (s)	SARRA
Nationality	MOROCCAN	Academic Year	2018- 2019
Position	A. PROFESSOR		
E-mail address	Sarra.sefrioui@gmail.com		

The sending university

Name	Abdel Malek Essaâdi
Faculty/Department	Faculty of Law, Economics and Social Studies
Address	Ancienne Route de l'Aéroport, BP: 1373, Tanger Principale 90 000. Tangier
Country	Morocco

Contact person

First/Last name(s)	M. Bouchta EL MOUMNI
Position	Professor

The receiving university

Name	Université de Bretagne Occidentale
Faculty/Department	Law
Address	Faculté de Droit, Sciences Économiques, Gestion et AES. à Brest 12 rue de Kergoat - CS93837 29238 Brest Cedex 3.
Country	France

Contact person

First/Last name(s)	David GRAINDORGE
Position	Professor

Type of mobility

☐ Technical skills
☐ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The overall objectives of the mobility regarding ScolaMAR are to:

Participate in the elaboration of one or more of the 18 training modules of the Master's program by giving the feedback and activity report of my participation in the "Job-shadowing" activities.

Participate in the develop of an innovative Master program which will be submitted for co-accreditation to the Ministry of Higher Education, Scientific Research and Management Training in Morocco (MESFCRS)

With regard to the module, the main objective is to develop new and innovative teaching technics in the module that I will have in charge.

With regard to the University, the mobility have the objective to continue the practice of partnership already initiated.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	3/12/2018	SUPPOSED TO BE: Welcoming by the director of the Masters Droit des Activités Maritimes. BUT: Involuntarily late arrival to France because of : absence of flights the three days before, arrival by flight to Paris and train until midnight, Strike of the “Gilets Jaunes”, absence of fuel and taxis in all the city, stuck in the station until 2 am) RESULT: The director of the Masters refused to reschedule the welcoming and though was canceled.
2	04/12/2018	13h30 – 17h : Droit International de la Mer
3	05/12/2018	8h30 – 12h30 : Droit International de la Mer
4	06/12/2018	9h – 12h : Droit de la plaisance 14h – 17h : Droit de la plaisance
5	07/12/2018	8h30 – 16h : Journée d’Etude « Le transport maritime face aux changements climatiques »

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6	10/12/2018	8h30 – 12h30 : Droit International de la Mer – Valère Ndior
7	11/12/2018	CANCELLED BY THE ORGANISORS Visit to Institut Universitaire Européen de la Mer (IUEM) Visit to Library La Pérouse Presentation du Master Sciences de la Mer et du Littoral
8	12/12/2018	14h – 18h : Droit International de la Mer
9	13/12/2018	9h -12h : Droit portuaire 13h30 – 17h30 : Droit International de la Mer
10	14/12/2018	9h – 12h : Droit Portuaire 13h30 – 16h30 : Droit Portuaire

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

In the framework of the Masters Project that will be established I will be in charge of the Law of the Sea and marine geopolitics Module (*Droit de la mer et géopolitique marine*). The mobility have enable me to visit the Masters 'Maritime Activities' and discover how some teachings are delivered. Some case studies that were given to the students were not suffisant to have an added value to my teaching module. The teaching technics did not have the added value expected.

This mobility could have an important added value to the Univerity and to the ScolaMAR project in terms of the establishement of a strong partnership with the IUEM which have a good experience in the marine science.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

I will disseminate the results of my mobility by discussing them with the relevant concerned persons by spreading the word about the project outcomes. This will help to develop a revised way of achieving objectives and inform future policy and practice.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)
SEE ATTACHED

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	Droit de la mer et géopolitique marine
Thematic(s)	LAW OF THE SEA, MARINE GEOPOLITIC
Type of module *(Select one or more boxes)*	☒ **Lecture course** ☐ Tutorial exercice ☒ **Practical exercice** ☐ Group workshop ☐ Field trip ☐ Other – precise:

Teaching manager	SARRA SEFRIOUI
Speakers *(Precise if external speakers)*	EXTERNAL SPEAKERS (NOT CONFIRMED) PROF. NATHALIE ROS PROF. FLORENCE GALETTI PROF. FRANCOIS FERAL DR. KHANSSA LAGDAMI

Year / Semester	SECOND SEMESTER
Number of hours	60
Number of groups	1 GROUP

Objectives	AFTER SUCCESSFULLY COMPLETING THIS COURSE, STUDENTS WILL BE ABLE TO: 1. DESCRIBE AND EXPLAIN PREVALENT LEGAL CONCEPTS UNDER THE 1982 UNITED NATIONS CONVENTION ON THE LAW OF THE SEA 2. CONDUCT RESEARCH ON THE THEORETICAL UNDERPINNINGS OF SUCH CONCEPTS AND APPLY THEM TO REAL-LIFE SITUATIONS, INCLUDING THE TENSION BETWEEN STATE SOVEREIGNTY AND INTERNATIONAL COOPERATION AT PLAY WITHIN MARITIME AREAS 3. INTERPRET AND ANALYSE FACT PATTERNS AND FORMULATE (PRELIMINARY) ASSESSMENTS REGARDING THE LAW OF THE SEA, INCLUDING IN THE FRAMEWORK OF ITS DISPUTE SETTLEMENT MECHANISMS 4. STRATEGICALLY ASSESS THE PRACTICAL IMPLICATIONS OF THE LAW OF THE SEA
Content	THIS COURSE IS DEDICATED TO THE LAW OF THE SEA, I.E. THE LAW THAT REGULATES THE ACTIVITIES OF STATES AND CERTAIN OTHER ACTORS AND THEIR INTERACTIONS REGARDING MARITIME MATTERS.

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	THIS COURSE STARTS BY HIGHLIGHTING THE MAIN LANDMARKS THAT SHAPED THE HISTORY OF THE LAW OF THE SEA AND SUBSEQUENTLY FOCUSSES ON THE CONTEMPORARY LEGAL REGIME GOVERNING MARITIME AREAS WHICH CONSISTS IN GREAT PART OF THE 1982 UNITED NATIONS LAW OF THE SEA CONVENTION (UNCLOS). STUDYING THE UNCLOS WILL ALLOW STUDENTS TO PAY CLOSE ATTENTION TO THE RULES GOVERNING THE DIFFERENT JURISDICTIONAL ZONES OF THE OCEAN, THE NAVIGATION OF SHIPS, THE EXPLOITATION OF LIVING AND NON-LIVING RESOURCES AND MARITIME BOUNDARY DELIMITATION. THIS COURSE ALSO COVERS THE STATUS OF LAND-LOCKED AND GEOGRAPHICALLY DISADVANTAGED STATES AND ADDRESSES ALSO THE RELEVANT INTERNATIONAL INSTITUTIONAL FRAMEWORK, MOST NOTABLY THE INTERNATIONAL SEABED AUTHORITY (ISA), THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA (ITLOS), AND THE COMMISSION ON THE LIMITS OF THE CONTINENTAL SHELF (CLCS). THIS COURSE ALSO ADDRESSES DISPUTE SETTLEMENT BY ANALYSING LANDMARK, RECENT, AND ONGOING DISPUTES PERTAINING TO THE LAW OF THE SEA AS A MEANS TO IDENTIFY CONTEMPORARY LEGAL CHALLENGES AND AS AN OPPORTUNITY LOOK AT A SPECIFIC SET OF LEGAL ISSUES IN GREATER DEPTH AND IN CONTEXT. THIS COURSE WILL NOT COVER 'MARITIME' LAW WHICH FOCUSES ON THE RELATIONS BETWEEN ENTITIES AND INDIVIDUALS REGARDING MARITIME TRANSPORT, INSURANCE, AND LIABILITY. THIS COURSE WILL ALSO LIMIT ITSELF TO COVERING THE LAW OF THE SEA APPLICABLE IN PEACETIME.
Teaching methods	(SEE TABLE ATTACHED)
Knowledge required	PUBLIC INTERNATIONAL LAW INTERNATIONAL ENVIRONMENTAL LAW INTERNATIONAL DISPUTE SETTLEMENT RECOMMENDED: SOVEREIGNTY AND STATEHOOD + LEGAL METHODS
Skills required	STUDENTS WILL NEED TO DEMONSTRATE INITIATIVE AND EXERCISE INDEPENDENT LEGAL THINKING ABILITIES. WRITING SKILLS IS REQUIERED AS STUDENTS WILL BE ASKED TO WRITE A POLICY BRIEF FOCUSING ON A TOPIC OF THEIR CHOOSING AMONG THE TOPICS RELATED TO THE LAW OF THE SEA. IN WRITING THIS BRIEF, STUDENTS WILL ALSO DEVELOP THEIR SYNTHESIZING AND TEAM-WORKING SKILLS.
Equipment required	CARTE MARINE ; CARTE D'ILLUSTRATIONS DES ASPACTS DE DROIT DE LA MER RETRO PROJECTEUR ; TABLEAU …
Type of evaluation *(Select one or more boxes)*	✓ ☐ Oral – precise: ✓ ☐ Written – precise: ☐ Other – precise:
Comments on evaluations *(Precisions on criteria)*	In-class participation and debate leadership (25%) Class work and case studies (25%) Final exam (50%)

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ANNEX: Teaching methods

1. **Upstream work:**	Students have to prepare the lecture before coming to class. They read the lecture of the day and may also read some documents related to the topic of the lecture that I send the before.
2. **Brainstorming before starting the lecture:**	Before starting every lecture I ask the students about what they know about the topic of the lecture. We do a brainstorming
3. **Team work in class** a) **for preparing the assignment:**	in the last 20 remaining minutes of each class, I give assignment to student and divide them into groups. Every team prepares the answers and we correct them in class .
b) **for learning how to make questions and how to answer them:**	to make a general revision of the lectures, I divided the students into groups, each one has a topic from which they must come up with questions and ask the other group.
4. **Refreshing the mind:**	Before I start explaining the day's lecture, the students are obliged to recapitulate all the ideas and points explained in the previous lecture. It reminds them the main ideas of the last lecture and it refreshes their mind and makes them able to follow with the new lecture .
5. **Make the lecture very interactive and make the students participate either when they want or when I design.**	Every student has the right to ask questions during the lecture. I encourage them a lot to ask questions and to have interrogations.

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6. **Ask questions during and in the end of the lecture:**	The way to make students participate is to ask them question, to explain an idea that I have stated or to give his/her opinion.
7. **Using technology in class:**	– Assignments are sent to them by email. – During the lecture the PPT presentation is projected and explained in class.
8. **Preparing Power Point presentation:**	A Power Point prepared will be prepared
9. **Independent study:**	Students are expected to take responsibility for their own learning and they needed to manage their time effectively to fit this around their academic timetable and any other activities that they are involved in. Studying independently doesn't necessarily mean they were studying on their own as there are plenty of opportunities to study in groups and many of our courses actively promote peer mentoring.
10. **Simulation of negotiation :**	before the end of the module, students would have to practiced a simulation of negotiation. The main purpose was to create real situations in a virtual world. These situations are created in order to put skills into practice in a zero risk environment. The higher the interaction was, the better the learning quality. Every student will have to represent a State and will have to negotiate for the interests of its State.
11. **Case studies**	Case studies will be analysed regarding different topics of the module

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UNIVERSIDAD DE CADIZ

From	To	University	Staff name
20/02/2018	05/03/2018	Abdelmalek Essaâdi Tangier	MAATOUK Mustapha
08/03/2018	16/03/2018	Ibn Tofail Kenitra	BEJJAJI Zohra
		Ibn Tofail Kenitra	BOUABDLI Abdelhak
		Ibn Tofail Kenitra	CHAKIRI Saïd
08/03/2018	13/03/2018	Abdelmalek Essaâdi Tangier	EL ARRIM Abdelkrim
31/03/2018	14/04/2018	Chouaib Doukkali El Jadida	ZOURARAH Bendahhou
		Chouaib Doukkali El Jadida	EL KHALIDI Khalid
02/04/2018	14/04/2018	Mohammed V Rabat	HAKKOU Mounir
16/04/2018	29/04/2018	Abdelmalek Essaâdi Tangier	JAMI Jihad
14/11/2018	27/11/2018	Mohammed V Rabat	BAZAIRI Hocein
		Mohammed V Rabat	BENHOUSSA Abdelaziz

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[20/02/2018]** till **[05/03/2018]**
Duration (days) – excluding travel days: 12 days

The Staff Member

Last name (s)	MAATOUK	First name (s)	Mustapha
Nationality	Moroccan	Academic Year	2017 - 2018
Position	Lecturer		
E-mail address	maatoukm@gmail.com		

The sending university

Name	Abdelmalek Essaâdi University
Faculty/Department	Faculty of Science and Technology of Tangier
Address	Ancienne route de l'aéroport, Km 10, Ziaten. BP. 416 Tangier.
Country	Morocco

Contact person

First/Last name(s)	Mohammed ADDOU
Position	Dean of the faculty.

The receiving university

Name	University of Cadiz
Faculty/Department	Faculty of Marine and Environnemental Sciences CASEM
Address	Avda. Universidad de Cádiz, nº 10, 11510 University Campus of Puerto Real
Country	Spain

Contact person

First/Last name(s)	Fidel ECHEVARRIA
Position	UCA ScolaMAR coordinator

Type of mobility

☒ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The main objective of my mission is to see the applications of geomatics in the field of coastal risks. But on the other hand, to attend new pedagogical news transmission of knowledge in the context of a Masters in general and in the field of natural hazards in particular.
See how researchers come together around a pedagogical project by using the results of their research in their illustrations and teaching.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	Tuesday 20/02/2018	I took the departure from Tangier in the morning, to arrive in the early afternoon at the University of Cadiz (15: 30). I had a brief meeting with Professor Laura Del RIO RODRIGUEZ coordinator of the module: **GIS applied to Integrated Coastal Zone Management**. Pr. Laura gave me a detailed program of my mission at UCA. From 16: 00 to 18: 00, I attended the first lectures course on the : ***Introduction to GIS applied to ICZM*** (**Prof. Laura DEL RIO**). After a break of 30 minutes, the lecture course taken from 18:30 to 20:30. (*Prof. Laura DEL RIO*)
2	Wednesday 21/02/2018	9: 00 to 10:15: In the campus library, I established a bibliographic list related to coastal risks. 10: 30 to 12: 30 : Lectures course "**Environnement, Economy and Society**" from the Degree in Environnemental Sciences. (***Prof. Ana MARCIAS***). 16: 00 to 18: 00, Lectures course " GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Models and data sources with QGIS***. (**Prof**. **Alfredo FERNANDEZ ENRIQUEZ**). 18 : 30 to 20: 30, Lectures course " GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Map information on the Internet. The spatial data infrastructures (IDE)***. (**Prof.** **Manuel ARCILA**).
3	Thursday 22/02/2018	9: 30 to 14: 00: Final meeting of the research projet "MEGAN" (**Prof. Fidel ECHEVARRIA**) (see details in **appendix 1**). 16: 00 to 18: 00, Lectures course "GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Geoprocess and geostatistics with ArcGis***. (**Prof**. **Alfredo FERNANDEZ ENRIQUEZ**). 18: 30 to 20: 30, Lectures course " GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Analytic Hierarchy Process (AHP).*** (**Prof**. **Alfredo FERNANDEZ**).
4	Friday 23/02/2018	10:00 to 12: 30 : Defense of several final Projects End of Study from the degrees in Marine Sciences and Environnemental Sciences (see details in **appendix 2**). 16: 00 to 18: 00, Lectures course "GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Analysis of changes in the shore line short and medium term***. (**Prof. Laura DEL RIO**).

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		18: 30 to 20: 30, Lectures course " GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Analysis of changes in the shore line short and medium term.*** (**Prof. Laura DEL RIO**).
5	Monday 26/02/2018	08: 30 to 10: 00 : a guided tour to the Faculty of Marine and Environmental Sciences with the Vice Dean of International Relations (**Alazne Echevarría**). 10: 30 to 11: 30 : Lectures course "**Environnement, Economy and Society**" from the Degree in Environnemental Sciences. (**Prof. Ana MARCIAS**). 11: 30 to 12: 30 : Lectures course "**Natural Hazards**" from the Degree in Environnemental Sciences. 16: 00 to 18: 00 : Lectures course "GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Assessment of the effects of storms in coastal areas*** (**Prof. Laura DEL RIO**). 18: 30 to 20: 30, Lectures course "GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Study of compatibility of activities with the regulations***. (**Prof. Laura DEL RIO**).
6	Tuesday 27/02/2018	10:30 to 11:30 : Lectures course "**Environnement, Economy and Society**" from the Degree in Environnemental Sciences. (**Prof. Ana MARCIAS**). 11: 30 to 12: 30 : Lectures course "**Natural Hazards**" from the Degree in Environnemental Sciences. (**Prof. Laura DEL RIO**). 16: 00 to 18: 00 : Lectures course "GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Study of the vulnerability of coastal systems through indices.*** (**Prof. Laura DEL RIO**). 18: 30 to 20: 30, Lectures course "GIS applied to ICZM" from the Master in Integrated Coastal Zone Management : ***Evaluation of effects of storms in coastal areas***. (**Prof. Laura DEL RIO**).
7	Wednesday 28/02/2018	**Bank holiday in Andalucia** Field trip on the coast of El Puerto Santa Maria to see the damage the last bad weather: coastal erosion, .submersion ... (see photos attached).
8	Thursday 01/03/2018	09: 30 to 11: 30 : Lectures course " **Anthropogenic Impact in Coastal Zones**" from the Master in Oceanography. (**Prof. Laura DEL RIO**). 16: 00 to 18: 00 : Lectures course "**GIS applied to ICZM**" from the Master in Integrated Coastal Zone Management : ***Calculation of the flooding sea level rise***. (**Prof. Laura DEL RIO**). 18: 30 to 20: 30, Lectures course "**GIS applied to ICZM**" from the Master in Integrated Coastal Zone Management : ***Web-mapping for the evaluation of water quality and risks in the area of the Bay of Cádiz. First part: algae bloom***. (**Prof. David BENITEZ**).
9	Friday 02/03/2018	9: 30 to 12: 00: In the campus library, I established a bibliographic list related to coastal risks. 16: 00 to 18: 00 : Lectures course "**GIS applied to ICZM**" from the Master in Integrated Coastal Zone Management : ***Web-mapping for the evaluation of water quality and risks in the area of the Bay of Cádiz. Second part: coastal risk and vulnerability.*** (**Prof. David BENITEZ**). 18: 30 to 20: 30, Lectures course "**GIS applied to ICZM**" from the Master in Integrated Coastal Zone Management : ***Web-mapping for the evaluation of water quality and risks in the area of the Bay of Cádiz. Third part: publication of the data in the network with ArcGis online.*** (**Prof. David BENITEZ**).

Add lines to the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

The content of my mission is interesting in several ways:

1. To the module I propose in the Master's degree: in addition to the theoretical part of Geographical Information Systems that I already master and that I teach since a 10th of a year, I will start practical work and mini- projects, just like those I was able to follow during my mission;
2. At Abdelmalek Essaâdi University: by integrating this practical work into a module : GIS and decision-making in the Engineering Geoinformation accredited to the Tangier FST;
3. To the ScolaMAR project: by teaching this module if it is necessary in all the Moroccan faculties members of the consortuim to spread the methodology adopted by the colleagues of the UCA.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

The results of my mission will be disseminated in several ways:

1. First, I will send a detailed report of my mission to the coordinators of the project on the Moroccan side and the European side;
2. At the end of all the missions scheduled for ScolaMAR, a meeting will be organized by the project leader: Pr. EL MOUMNI, for the assembly of the module projects, and at that moment, I will present the results of my mission and the articulation of the module that I propose;
3. Based on the overall content of the mission, I am writing a project between our two research teams (UCA and UAE) in the field of coastal risks, and the documents and the results of this project will be the basis of the project. assembly of the practical work, as well as the preparation of the field trips for the Master.

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ANNEXE 1:

Meeting final MEGAN

Lugar: Sala de juntas del departamento de Biología ó sala de juntas del INMAR (Pendiente de confirmación)

Día: Jueves 22 de Febrero de 2018.

Programa de la reunión:

09.30 – 10:00	Bienvenida y presentación, **Fidel, Carlos, Miki, Águeda**
10:00 – 10:20	Tesis sub-proyecto 1, **Iria**
10:20 – 10:40	Tesis sub-proyecto 2, **Marina**
10:40 – 11:00	Tesis **Juanxo**
11:00 – 11:30	Coffee break
11:30 – 11:45	Aves y Directiva Marco, **Gonzalo y/o Andrés de la Cruz**
11:45 – 12:00	PUAs, **Ana**
12:00 – 12:15	Metales-vitaminas, **Tovar**
12:15 – 12:30	Microplásticos, **Andrés y/o Elisa**
12:30 – 12:45	Citometría y Pigmentos, **Cristina**
12:45 – 13:00	Satélite, **Gabi**
13:00 – 14:00	Debate (Moderan **Fidel-Águeda**): Preparación del informe final del proyecto.
14:00 – 15:30	Comida.
15:30 – 17:30	Debate (Moderan **Carlos-Miki**): Tareas pendientes. Posibles colaboraciones en trabajos futuros.

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ScolaMAR
Erasmus+ Capacity building

11/03/2018

Programa de la reunión:

09.30 – 10:00	Bienvenida y presentación, **Fidel, Carlos, Miki, Águeda**
10:00 – 10:20	Tesis sub-proyecto 1, **Iria**
10:20 – 10:40	Tesis sub-proyecto 2, **Marina**
10:40 – 11:00	Tesis **Juanxo**
	CAFÉ
11:30 – 11:45	Aves y Directiva Marco, **Gonzalo y/o Andrés de la Cruz**
11:45 – 12:00	PUAs, **Ana**
12:00 – 12:15	Metales-vitaminas, **Tovar**
12:15 – 12:30	Microplásticos, **Andrés y/o Elisa**
12:30 – 12:45	Citometría y Pigmentos, **Cristina**
12:45 – 13:00	Satélite, **Gabi**
13:00 – 14:00	Debate (Moderan **Fidel-Águeda**): Preparación del informe final del proyecto.
	COMIDA
15:30 – 17:30	Debate (Moderan **Carlos-Miki**): Tareas pendientes. Posibles colaboraciones en trabajos futuros.

Programa de la reunión:

09.30 – 10:00	Bienvenida y presentación, **Fidel, Carlos, Miki, Águeda**

INDICE:
- Pinceladas de estructura del proyecto MEGAN
- Objetivos, hitos y entregables
- Otros compromisos
- Requerimientos del Informe final

12:30 – 12:45	Citometría y Pigmentos, **Cristina**
12:45 – 13:00	Satélite, **Gabi**
13:00 – 14:00	Debate (Moderan **Fid** del proyecto.
	COMIDA
15:30 – 17:30	Debate (Moderan **Car** colaboraciones en tra

... pero, antes de empezar, un recordatorio obligado:

Dr. Luis Lubián Chaichío
(Profesor Investigación ICMAN-CSIC)

nos dejó el 6 de Octubre de 2017

Descanse en paz

PROYECTO MEGAN

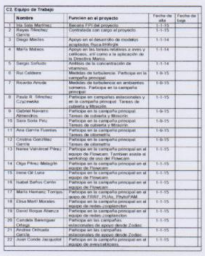
ESTRUCTURA GENERAL: 2 SUBPROYECTOS COORDINADOS

SP1: MEGAN-BIOLOGÍA

Investigadores principales:	EDP
IP1: Fidel Echevarría (UCA)	1
IP2: Carlos M. García (UCA)	1
Equipo investigador:	
Ana Bartual Magro (UCA)	0,5
Luis Lubián Chaichio (CSIC)	0,5
Andrés Cózar Cabañas (UCA)	0,5
Gonzalo Muñoz Arroyo (UCA)	0,5
Doctores del equipo de trabajo:	
María Mateos (UCA)	
Diego Macías (JRC)	
Sergio Sañudo (USC)	
	4 EDPs

SP2: MEGAN-FÍSICA

Investigadores principales:	EDP
IP1: Miguel Bruno (UCA)	1
IP2: Agueda Vázquez (UCA)	1
Equipo investigador:	
Julio Reyes Pérez (UCA)	1
Jorge Macías (UMA)	0,5
Jose Manuel González (UMA)	0,5
Salvador Moreno (IHM)	0,5
Doctores del equipo de trabajo:	
Jeff Paduan (NPSO-Monterey)	
Craig Bishop (NRL-Monterey)	
Araceli García (UCA)	
	4,5 EDPs



Equipo de trabajo del subproyecto 1 (informado en el informe de seguimiento intermedio)

La mayoría de las incorporaciones son de personal de apoyo en la campaña principal.

1

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PROCESOS DE MESOSCALA Y SUBMESOSCALA EN EL ESTRECHO DE GIBRALTAR: LA CONEXIÓN TRAFALGAR-ALBORÁN
(MEGAN)

OBJETIVO GENERAL DEL PROYECTO MEGAN

Analizar el papel que *los procesos submesoescalares costeros, el flujo e interacción costa-mar abierto en el entorno del Estrecho y el transporte hacia el mar de Alborán* tienen sobre los patrones de dispersión y distribución de los organismos planctónicos y de otros materiales disueltos y particulados.

Especial énfasis en la región de mezclas/afloramiento costero de los **Bajos de Trafalgar** como zona de alta producción, y en el estudio del transporte hacia el Mediterráneo, lo que nos permite plantear el estudio en términos de "**la conexión Trafalgar-Alborán**".

4 BLOQUES Y 7 OBJETIVOS ESPECÍFICOS:

BLOQUE	DESCRIPCIÓN	OBJETIVO ESPECÍFICO
1	Análisis de fenómenos costeros en **Trafalgar** a escala estacional y mareal con pequeñas embarcaciones	1
2	Procesos de **mesoescala** que determinan transportes hacia Alborán. Análisis euleriano y lagrangiano	2, 3, 4
3	**Modelado** hidrodinámico y biológico. Síntesis e integración	5
4	Objetivos **complementarios**, no nucleares	6, 7

A continuación se resumen objetivos y tareas de subproyecto 1 y subproyecto 2, o subproyectos 1 y 2

Objetivo específico 1 (Trafalgar): Realizar series de observaciones a nivel mareal, estacional y/o ligadas a los principales patrones de variación en el sector costero del Cabo de Trafalgar.

O1.1 Análisis de registros de alta frecuencia de muestreo de **velocidad de la corriente** adquiridos por perfiladores de corriente. Observaciones de **patrones hidrodinámicos** de circulación (con énfasis en el establecimiento de comunicación y flujo entre subsectores y costa-canal), vórtices, difusión turbulenta y posición y **dinámica de frentes costeros**. (Sub 2) AV, MB, JR; SM; C2

O1.2 Caracterización del medio, **variables físicas básicas**, disponibilidad de **nutrientes**, **tensión de oxígeno y ambiente lumínico**. (Sub 1) FE, CMG, AB, NG, C1

O1.3 Caracterización de la **estructura y dinámica de la comunidad planctónica** (fluorescencia, pigmentos, composición de la comunidad). (Sub1) CMG, LL, AB, FE, C1

O1.4 Seguimientos de **estado fisiológico y actividad del fitoplancton** (estado fisiológico, organismos productores de PUAs, porcentajes de clorofila activa, indicadores de producción) (Sub1) AB, LL, NG, CG, C1

O1.5 Identificación de patrones de **variabilidad temporal de temperatura superficial** del mar (SST) y **clorofila** superficial en la zona costera del cabo de Trafalgar mediante la interpretación de **imágenes de satélite** (Sub2) AV, AG, SM, JR

Objetivo específico 2 (Circulación a mesoscala): Proponer patrones de circulación y medidas de corrientes a nivel mesoscalar en la zona del Estrecho y Mar de Alborán Occidental.

O2.1 Desplegar e interpretar **datos de fondeos** (Sub2) AV, JR, MB, C2

O2.2 Desplegar e interpretar datos de **radares** de alta frecuencia (Sub2) JP, MB, SM, JR

O2.3 Análisis de **registros ADCP** (Sub2) MB, AV, C2

O2.4 Despliegue, seguimiento e interpretación de datos de **deriva de boyas lagrangianas**. (Sub 2) MB, AV, C2

Objetivo específico 3 (Propiedades del agua a mesoscala)

O3.1. Realización de **observaciones a mesoscala de alta resolución temporal** a través de muestreos en malla, y transectos en campaña principal y campañas de oportunidad. (variables fisicoquímicas básicas y biológicas, dispersión de trazadores) (Sub1 y Sub 2) FE, CG, MB, AV, C1, C2

O3.2. Determinar los **cambios en las propiedades de las masas de agua superficiales a través de seguimiento de boyas de deriva** (muestreo lagrangiano) desde las zonas costeras del sector atlántico del estrecho de Gibraltar hacia Alborán.

O3.2.1 Describir los cambios de las **propiedades físico-químicas del agua y ambiente lumínico**. (Sub1 y 2) FE, CMG, MB, AB

O3.2.2 Describir los cambios en la **estructura de la comunidad planctónica** (fluorescencia, pigmentos, composición de la comunidad) al lo largo del canal del Estrecho y durante el tránsito hacia Alborán. (Sub 1) CMG, LL, AB, FE, C1

O3.2.3 Seguimientos de **estado fisiológico y actividad del fitoplancton** (estado fisiológico, organismos productores de PUAs, vitaminas, porcentajes de clorofila activa) a medida que el chorro de agua atlántica se interna en el mar de Alborán. (Sub1) AB, LL, SS, CG, C1

O3.2.4 Estudio de **distribución de residuos plásticos** (Sub 1)(AC)

Objetivo específico 4 (Circulación regional Satélite).

Catalogar los diferentes **patrones de circulación en el Mar de Alborán y Golfo de Cádiz a escala regional** y el acoplamiento de estos procesos a través del estrecho de Gibraltar a partir del análisis de imágenes de satélite de color oceánico y SST. (Sub2) AV, MB, AE, AG, C2

2

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Objetivo específico 5 (Modelado). Simulación hidrodinámica de procesos de transporte y dispersión de sustancias a nivel de submesoescala, con especial énfasis en la zona de Trafalgar, y mesoescala con énfasis en el intercambio de propiedades entre esta zona y el Mar de Alborán.

O5.1. Implementación de **modelos simplificados** (2D de dos capas) para ayudar a la comprensión de los procesos submesoescalares de los bajos de Trafalgar y el transporte y dispersión de las descargas de los ríos Guadiana y Guadalquivir. (Sub 2) JM, JG, MB, AV, MR, C2

O5.2. Contribuir a la mejora de los **modelos de simulación hidrodinámica** de Puertos del Estado a través de la asimilación de los campos de corriente registrados por el sistema de **radares costeros** del Estrecho. (Sub 2) MB, AV, CB, MR, C2

O5.3. **Implementación de esquemas de transporte y dispersión** en los campos de corriente simulados con los modelos hidrodinámicos (**MERCATOR Y SAMPA**) de Puertos del Estado. Aplicación de estos modelos en el transporte y dispersión de sustancias (fitoplancton, nutrientes, plásticos) en el Mar de Alborán. (Sub 1 y 2) MB, JM, JG, AC, AV, CG, DM

Objetivo específico 6 (Aves y depredadores apicales). Implementación de tareas conjuntas con el Grupos de Estudio de Aves Marinas de la UCA para responder a dos objetivos principales:

O6.1 Estudiar la **respuesta de los depredadores apicales** (principalmente aves marinas,) a los procesos hidrodinámicos y a sus efectos biológicos en los niveles inferiores de las redes tróficas a distintas escalas espaciales y temporales (Sub 1) GM, MM, CG

O6.2 **Calibración de métodos de seguimiento** mediante el uso de **radares costeros** para el estudio de la distribución y el uso del espacio de aves marinas (Sub 1 y Sub 2) GM, MM, MB)

Objetivo específico 7 (Gestión y MSFD). Analizar las **implicaciones medio-ambientales** de los resultados obtenidos en la gestión de la zona marina estudiada (Mar de Alborán – Estrecho de Gibraltar – Golfo de Cádiz). Se hará un esfuerzo para adaptar la información generada en un formato que la haga utilizable en el contexto de la aplicación de la **Directiva Marco de Estrategia Marina** y permita ayudar a concretar en estado medioambiental de la región oceánica estudiada. Asimismo, la información generada será fundamental para el diseño y la **gestión desde un enfoque ecosistémico** de las áreas marinas protegidas encuadradas en el ámbito del estudio. (Sub 1 y Sub2) GM, FE, AV

OBJETIVO 1 (Trafalgar)

Hitos

Hito 1: Campaña estacional de **primavera** T3
Hito 2: Campaña estacional de **Verano** T4
Hito 3: Campaña estacional de **Otoño** T5
Hito 4: Campaña estacional de **Invierno** T6
Hito 5: Participación en campañas **STOCA** T1 a T8
Hito 6: Campaña de oportunidad en buques del **IHM** T3 y T6
Hito 7: Recopilación de imágenes de **satélite** disponibles T1
Hito 8: Estudio de la variabilidad temporal de clorofila y temperatura superficial mediante análisis basado en **imágenes de satélites** T2

Entregables:

E1: Propuesta de **circulación** a pequeña escala en la zona costera somera de **Trafalgar** T8
E2: Informes de resultados de **campañas estacionales** en zona costera: cambios estacionales en la comunidad y propiedades del agua. T11
E3: Informe de **campañas de oportunidad** STOCA T9
E4: Informe de resultados de análisis de imágenes de **satélite** T8
E5: Difusión de los resultados a través de **revistas y/o congreso** científico (posiblemente en gran parte fuera del periodo de proyecto) T12

OBJETIVO 2 (Circulación a mesoscala)

Hitos

Hito 1: **Despliegue y fondeo de correntímetros** T3 y T6
Hito 2: Puesta a punto y obtención de **registros de radares costeros** T2
Hito 3: Pruebas de derivas y **medidas de corriente en campañas de oportunidad** (IHM) T3 y T6
Hito 4: **Realización de la campaña Principal** T3

Entregables

E1: Informe de serie de datos de **correntímetros** T7
E2: Informe de resultados de **corrientes por medio de radar** T5
E3: **Informe de campaña principal**: registros doppler y esquema de corrientes T5
E4: Informe de resultados e interpretación de **derivas de boyas lagrangianas**. T8
E5: Informe de **síntesis sobre patrones de circulación** T11
E6: Difusión de los resultados a través de **revistas y/o congreso** científico (posiblemente en gran parte fuera del periodo de proyecto) T12

OBJETIVO 3 (Propiedades del agua a mesoscala)

Hitos

Hito 1: Realización de la **campaña principal** y registros en tiempo real T3
Hito 2: Experimentos de **difusión de trazadores** (rodamina) T3
Hito 3: Análisis de concentraciones de **nutrientes inorgánicos** T4
Hito 4: Análisis de Pigmentos, TEPs, PUAs, proporciones de clorofila activa y otros **productos biológicos** T5
Hito 5: Análisis **ChemTax y Citometría** de la fracción menor del plancton T6
Hito 6: Análisis **FlowCam y microscopía** de fracción microplanctónica T7
Hito 7: Análisis de **composición del zooplancton** T8
Hito 8: Análisis de **distribución de plásticos** T7

Entregables

E1: Informe de Resultados de datos registrados en tiempo real y **datos de continuo**. T5
E2: Cartografía y dinámica de concentraciones de **nutrientes** inorgánicos T9
E3: Informe de campaña principal: distribución de **variables biológicas**, PUAs y TEPs T6
E4: Cartografía y dinámica de organismos del **pico y nanoplancton** T10
E5: Cartografía y dinámica de organismos **microplanctónicos** T11
E6: Distribución y dinámica de **zooplancton** T11
E7: Informe de distribución de residuos **plásticos** en la zona estudiada T10
E8: **Informe de síntesis: Dinámica de los cambios observados en propiedades del agua de entrada al Mediterráneo**. T12
E9: Difusión de los resultados a través de **revistas y/o congreso** científico (posiblemente en gran parte fuera del periodo de vigencia del proyecto) T12

OBJETIVO 4 (Circulación regional Satélite)

Hitos

Hito 1: recopilación de **imágenes disponibles**. T1
Hito 2: aplicación de técnicas de análisis para el estudio de la **distribución espacio-temporal de clorofila y temperatura superficial** del mar que abarquen la zona Mar de Alborán-Estrecho de Gibraltar y Golfo de Cádiz. T4
Hito 3: análisis de resultados. T9

Entregables

E1: informe de **resultados**. T10
E2: Difusión de los resultados a través de **revistas y/o congreso** científico (posiblemente en gran parte fuera del periodo de vigencia del proyecto) T12

3

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OBJETIVO 5 (Modelado)

Hitos:

Hito 1: Implementación de los **modelos hidrodinámicos simplificados** que se usarán en el estudio de mecanismos físicos que están detrás de los procesos submesoescalares de interés. T4
Hito 2: Implementación de técnicas de **asimilación de datos de corriente CODAR** en los modelos de simulación hidrodinámica de Puertos del Estado y validación experimental de los dichos modelos. T6
Hito 3: Aplicación de los modelos de simulación hidrodinámica en la interpretación de los resultados obtenidos del análisis de las observaciones tomadas en la **campaña principal**. T10

Entregables:

E1: Informe de resultados de las experiencias de **asimilación de datos CODAR** en los modelos de simulación hidrodinámica. T7
E2 : Informe de **análisis comparativo** entre las observaciones tomadas en las campañas oceanográficas y las distribuciones de variables simuladas con los modelos. T11
E3: Asesoramiento básico para la evaluación de flujos y riesgos de **acumulación de sustancias con flotabilidad positiva** y organismos en costas marroquíes y españolas de Alborán, con énfasis en plásticos y proliferaciones de medusas. T12

OBJETIVO 6 (Aves y depredadores apicales)

Hitos:

Hito 1: Realización de **censos en campañas estacionales**. T3, T4, T5 y T6
Hito 2.- Realización de **censos en campañas (STOCA** y otras). T1 a T8
Hito 3.- Censos complementarios **desde Costa**. T1 a T8
Hito 4: Puesta a punto de **método de adquisición de datos con radares** T3

Entregables:

E1: **Cartografía de aves marinas**: distribución y uso del hábitat T10
E2: Informe de **calibración y comparación de métodos** tradicionales de censo y datos adquiridos por radar T11
E3: Recopilación de **datos bibliográficos de distribución de cetáceos** y otros depredadores apicales T5
E4: **Informe de síntesis**: relación de distribución y actividad de aves (y otros depredadores apicales) con estructuras pelágicas físicas y biológicas y su dinámica. T12

OBJETIVO 7 (Gestión y MSFD)

Hitos:

Hito 1: Análisis de los **indicadores del buen estado ambiental** según la Directiva Marco del Medio Marino. T9
Hito 2: Implementar **cartografías** mediante el procesado y análisis de la información con metodologías basadas en SIG. T10

Entregables:

E1: Informe sobre los **indicadores del buen estado ambiental** en el área de estudio, con especial mención a los descriptores 1 (Biodiversidad), 4 (Redes Tróficas Marinas) y 5(Eutrofización). T11
E2: **Cartografía de áreas de elevada productividad** primaria. T11
E3: Cartografía de la **distribución de depredadores apicales** (aves marinas y cetáceos) **y su posible conexión con estructuras hidrodinámicas y biológicas**. T12

OTROS COMPROMISOS

PROYECTO MEGAN

Apartado 4.- Mecanismos de coordinación

A) REUNIONES GENERALES CON TODOS LOS PARTICIPANTES (mínimo 4)

1) Al inicio del proyecto (planificación de actividades, comprobación de equipos, primeras campañas de oportunidad...)
2) 3 meses antes de la campaña principal
3) Durante la propia campaña principal
4) Reunión final. Análisis resultados, explotación, artículos...

B) REUNIONES DEL COMITÉ DIRECTOR DEL PROYECTO (4 IPs) (trimestrales)

- Analizar la evolución del proyecto
- Asegurar la realización de tareas
- Organizar reuniones plenarias
- Asegurar la realización de hitos y entregables
- Coordinar la redacción de los informes de seguimiento

C) PÁGINA WEB, incluyendo intranet.

NO TENEMOS WEB,
pero Carlos hizo y mantuvo esta página de FaceBook

4

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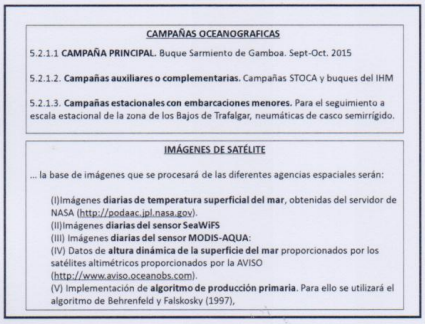


CAMPAÑAS OCEANOGRAFICAS

5.2.1.1 **CAMPAÑA PRINCIPAL.** Buque Sarmiento de Gamboa. Sept-Oct. 2015

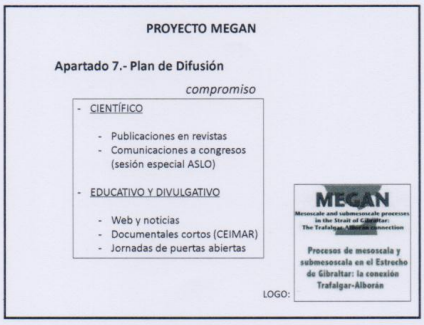
5.2.1.2. **Campañas auxiliares o complementarias.** Campañas STOCA y buques del IHM

5.2.1.3. **Campañas estacionales con embarcaciones menores.** Para el seguimiento a escala estacional de la zona de los Bajos de Trafalgar, neumáticas de casco semirrígido.

IMÁGENES DE SATÉLITE

... la base de imágenes que se procesará de las diferentes agencias espaciales serán:

(I)Imágenes **diarias de temperatura superficial del mar**, obtenidas del servidor de NASA (http://podaac.jpl.nasa.gov).
(II)Imágenes **diarias del sensor SeaWiFS**
(III) Imágenes **diarias del sensor MODIS-AQUA**:
(IV) Datos de **altura dinámica de la superficie del mar** proporcionados por los satélites altimétricos proporcionados por la AVISO (http://www.aviso.oceanobs.com).
(V) Implementación de **algoritmo de producción primaria**. Para ello se utilizará el algoritmo de Behrenfeld y Falskosky (1997),



PROYECTO MEGAN

Apartado 7.- Plan de Difusión

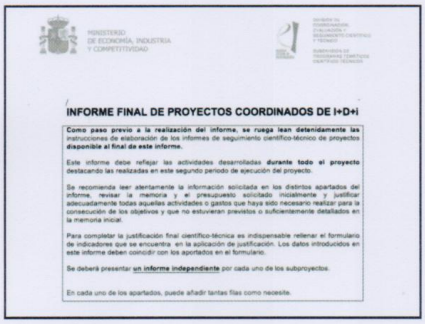
compromiso

- CIENTÍFICO
  - Publicaciones en revistas
  - Comunicaciones a congresos (sesión especial ASLO)
- EDUCATIVO Y DIVULGATIVO
  - Web y noticias
  - Documentales cortos (CEIMAR)
  - Jornadas de puertas abiertas

LOGO:

MEGAN
Mesoscale and submesoscale processes in the Strait of Gibraltar: The Trafalgar - Alboran Connection

Procesos de mesoescala y submesoescala en el Estrecho de Gibraltar: la conexión Trafalgar-Alborán



MINISTERIO DE ECONOMÍA, INDUSTRIA Y COMPETITIVIDAD

INFORME FINAL DE PROYECTOS COORDINADOS DE I+D+i

Como paso previo a la realización del informe, se ruega lean detenidamente las instrucciones de elaboración de los informes de seguimiento científico-técnico de proyectos **disponible al final de este informe.**

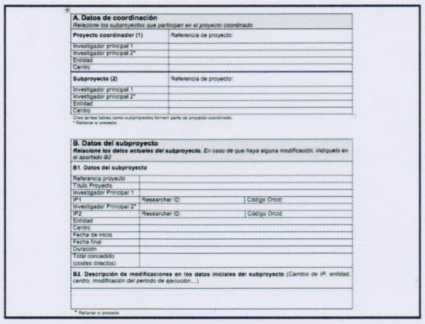
Este informe debe reflejar las actividades desarrolladas **durante todo el proyecto** destacando las realizadas en este segundo periodo de ejecución del proyecto.

Se recomienda leer atentamente la información solicitada en los distintos apartados del informe, revisar la memoria y el presupuesto solicitado inicialmente y justificar adecuadamente todas aquellas actividades o gastos que haya sido necesario realizar para la consecución de los objetivos y que no estuvieran previstos o suficientemente detallados en la memoria inicial.

Para completar la justificación final científico-técnica es indispensable rellenar el formulario de indicadores que se encuentra en la aplicación de justificación. Los datos introducidos en este informe deben coincidir con los apartados en el formulario.

Se deberá presentar **un informe independiente** por cada uno de los subproyectos.

En cada uno de los apartados, puede añadir tantas filas como necesite.



A. Datos de coordinación
Relacione los subproyectos que participan en el proyecto coordinado

Proyecto coordinador (1)	*Referencia de proyecto:
Investigador principal 1	
Investigador principal 2*	
Entidad	
Cargo	
Subproyecto (2)	Referencia de proyecto:
Investigador principal 1	
Investigador principal 2*	
Entidad	
Cargo	

Crear tantas tablas como subproyectos formen parte de proyecto coordinado.
* Referirse a proyecto

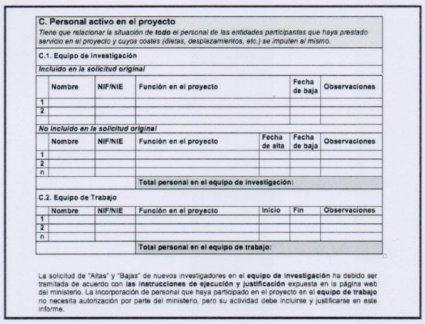
B. Datos del subproyecto
Relacione los datos estudio del subproyecto. *En caso de que haya alguna modificación, indíquelo en el apartado B2*

B1. Datos del subproyecto

Referencia proyecto			
Título Proyecto			
Investigador Principal 1			
IP1	Researcher ID:	Código Orcid:	
Investigador Principal 2*			
IP2	Researcher ID:	Código Orcid:	
Entidad			
Cargo			
Fecha de inicio			
Fecha final			
Duración			
Total concedido (costes directos)			

B2. Descripción de modificaciones en los datos iniciales del subproyecto *(Cambio de IP, entidad, cambio, modificación del periodo de ejecución...)*

* Referirse a proyecto



C. Personal activo en el proyecto
Tiene que relacionar la situación de ***todo*** *el personal de las entidades participantes que haya prestado servicio en el proyecto y cuyos costes (dietas, desplazamientos, etc.) se imputen al mismo.*

C.1. Equipo de investigación

Incluido en la solicitud original

	Nombre	NIF/NIE	Función en el proyecto	Fecha de baja	Observaciones
1					
2					

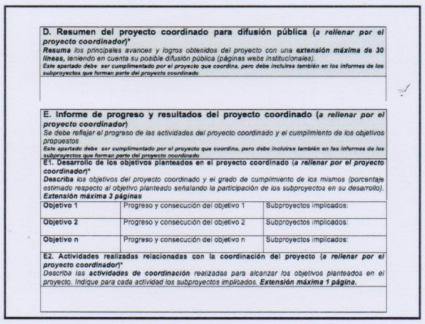
No incluido en la solicitud original

	Nombre	NIF/NIE	Función en el proyecto	Fecha de alta	Fecha de baja	Observaciones
1						
2						
n						
			Total personal en el equipo de investigación:			

C.2. Equipo de Trabajo

	Nombre	NIF/NIE	Función en el proyecto	Inicio	Fin	Observaciones
1						
2						
n						
			Total personal en el equipo de trabajo:			

La solicitud de "Altas" y "Bajas" de nuevos investigadores en el **equipo de investigación** ha debido ser tramitada de acuerdo con **las instrucciones de ejecución y justificación** expuesta en la página web del ministerio. La incorporación de personal que haya participado en el proyecto en el **equipo de trabajo** no necesita autorización por parte del ministerio, pero su actividad debe incluirse y justificarse en este informe.



D. Resumen del proyecto coordinado para difusión pública ***(a rellenar por el proyecto coordinador)****
Resuma *los principales avances y logros obtenidos del proyecto con una* ***extensión máxima de 30 líneas,*** *teniendo en cuenta su posible difusión pública (páginas webs institucionales).*
Este apartado debe ser cumplimentado por el proyecto que coordina, pero debe incluirse también en los informes de los subproyectos que forman parte del proyecto coordinado.

E. Informe de progreso y resultados del proyecto coordinado ***(a rellenar por el proyecto coordinador)***
Se debe reflejar el progreso de las actividades del proyecto coordinado y el cumplimiento de los objetivos propuestos
Este apartado debe ser cumplimentado por el proyecto que coordina, pero debe incluirse también en los informes de los subproyectos que forman parte del proyecto coordinado.

E1. Desarrollo de los objetivos planteados en el proyecto coordinado ***(a rellenar por el proyecto coordinador)****
Describa *los objetivos del proyecto coordinado y el grado de cumplimiento de los mismos (porcentaje estimado respecto al objetivo planteado señalando la participación de los subproyectos en su desarrollo).*
Extensión máxima 3 páginas

Objetivo 1	Progreso y consecución del objetivo 1	Subproyectos implicados:
Objetivo 2	Progreso y consecución del objetivo 2	Subproyectos implicados:
Objetivo n	Progreso y consecución del objetivo n	Subproyectos implicados:

E2. Actividades realizadas relacionadas con la coordinación del proyecto ***(a rellenar por el proyecto coordinador)****
Describa las ***actividades de coordinación*** *realizadas para alcanzar los objetivos planteados en el proyecto. Indique para cada actividad los subproyectos implicados.* ***Extensión máxima 1 página.***

5

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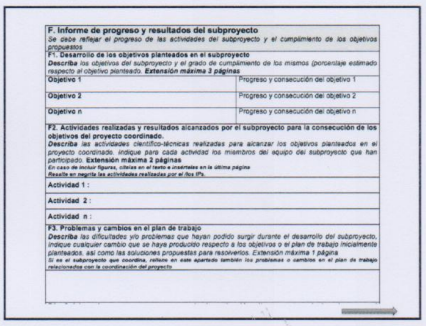
11/03/2018



F. Informe de progreso y resultados del subproyecto

Se debe reflejar el progreso de las actividades del subproyecto y el cumplimiento de los objetivos propuestos

F1. Desarrollo de los objetivos planteados en el subproyecto

Describa** los objetivos del subproyecto y el grado de cumplimiento de los mismos (porcentaje estimado respecto al objetivo planteado. **Extensión máxima 2 páginas

Objetivo 1	Progreso y consecución del objetivo 1
Objetivo 2	Progreso y consecución del objetivo 2
Objetivo n	Progreso y consecución del objetivo n

F2. Actividades realizadas y resultados alcanzados por el subproyecto para la consecución de los objetivos del proyecto coordinado.

Describa** las actividades científico-técnicas realizadas para alcanzar los objetivos planteados en el proyecto coordinado, indique para cada actividad los miembros del equipo del subproyecto que han participado. **Extensión máxima 2 páginas

En caso de incluir figuras, cítelas en el texto e insértelas en la última página

Resalte en negrita las actividades realizadas por el /los IPs.

Actividad 1 :

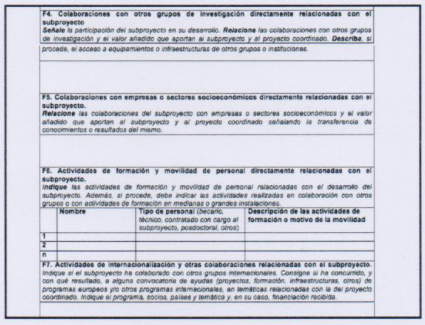
Actividad 2 :

Actividad n :

F3. Problemas y cambios en el plan de trabajo

***Describa** las dificultades y/o problemas que hayan podido surgir durante el desarrollo del subproyecto, indique cualquier cambio que se haya producido respecto a los objetivos o el plan de trabajo inicialmente planteados, así como las soluciones propuestas para resolverlos. Extensión máxima 1 página*

Si es el subproyecto que coordina, refiera en este apartado también los problemas o cambios en el plan de trabajo relacionados con la coordinación del proyecto



F4. Colaboraciones con otros grupos de investigación directamente relacionadas con el subproyecto

***Señale** la participación del subproyecto en su desarrollo. **Relacione** las colaboraciones con otros grupos de investigación y el valor añadido que aportan al subproyecto y al proyecto coordinado. **Describa**, si procede, el acceso a equipamientos o infraestructuras de otros grupos o instituciones.*

F5. Colaboraciones con empresas o sectores socioeconómicos directamente relacionadas con el subproyecto.

***Relacione** las colaboraciones del subproyecto con empresas o sectores socioeconómicos y el valor añadido que aportan al subproyecto y al proyecto coordinado señalando la transferencia de conocimientos o resultados del mismo.*

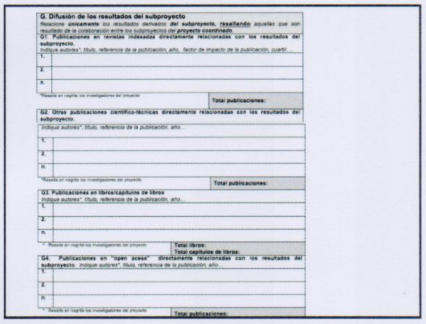
F6. Actividades de formación y movilidad de personal directamente relacionadas con el subproyecto.

***Indique** las actividades de formación y movilidad de personal relacionadas con el desarrollo del subproyecto. Además, si procede, debe indicar las actividades realizadas en colaboración con otros grupos o con actividades de formación en empresas o grandes instalaciones.*

	Nombre	Tipo de personal (becario, técnico, contratado con cargo al subproyecto, postdoctoral, otros)	Descripción de las actividades de formación o motivo de la movilidad
1			
2			
n			

F7. Actividades de internacionalización y otras colaboraciones relacionadas con el subproyecto.

Indique si el subproyecto ha colaborado con otros grupos internacionales. Consigne si ha concurrido, y con qué resultado, a alguna convocatoria de ayudas (proyectos, formación, infraestructuras, otros) de programas europeos y/o otros programas internacionales, en temáticas relacionadas con la del proyecto coordinado. Indique si programa, escala, países y temática y, en su caso, financiación recibida.



G. Difusión de los resultados del subproyecto

Relacione **únicamente** los resultados derivados **del subproyecto**, **resaltando** aquellas que son resultado de la colaboración entre los subproyectos del **proyecto coordinado**.

G1. Publicaciones en revistas indexadas directamente relacionadas con los resultados del subproyecto.

Indique autores, título, referencia de la publicación, año, factor de impacto de la publicación, cuartil*

1.
2.
n.

* Resalte en negrita los investigadores del proyecto

Total publicaciones:

G2. Otras publicaciones científico-técnicas directamente relacionadas con los resultados del subproyecto.

Indique autores, título, referencia de la publicación, año*

1.
2.
n.

* Resalte en negrita los investigadores del proyecto

Total publicaciones:

G3. Publicaciones en libros/capítulos de libros

Indique autores, título, referencia de la publicación, año*

1.
2.
n.

* Resalte en negrita los investigadores del proyecto

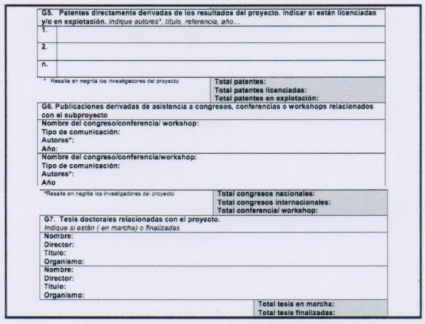
Total libros:
Total capítulos de libros:

G4. Publicaciones en "open acess" directamente relacionadas con los resultados del subproyecto. *Indique autores*, título, referencia de la publicación, año*

1.
2.
n.

* Resalte en negrita los investigadores del proyecto

Total publicaciones:



G5. Patentes directamente derivadas de los resultados del proyecto. Indicar si están licenciadas y/o en explotación. *Indique autores*, título, referencia, año…*

1.
2.
n.

* Resalte en negrita los investigadores del proyecto

Total patentes:
Total patentes licenciadas:
Total patentes en explotación:

G6. Publicaciones derivadas de asistencia a congresos, conferencias o workshops relacionados con el subproyecto

Nombre del congreso/conferencia/ workshop:
Tipo de comunicación:
Autores*:
Año:
Nombre del congreso/conferencia/workshop:
Tipo de comunicación:
Autores*:
Año

*Resalte en negrita los investigadores del proyecto

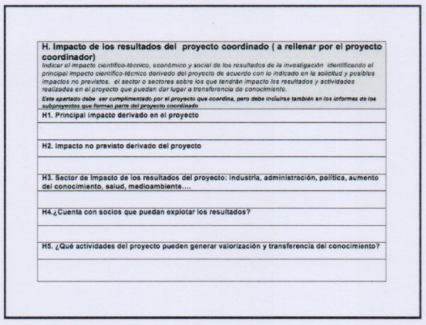
Total congresos nacionales:
Total congresos internacionales:
Total conferencia/ workshop:

G7. Tesis doctorales relacionadas con el proyecto.

Indique si están (en marcha) o finalizadas

Nombre:
Director:
Título:
Organismo:
Nombre:
Director:
Título:
Organismo:

Total tesis en marcha:
Total tesis finalizadas:



H. Impacto de los resultados del proyecto coordinado (a rellenar por el proyecto coordinador)

Indicar el impacto científico-técnico, económico y social de los resultados de la investigación identificando el principal impacto científico-técnico derivado del proyecto de acuerdo con lo indicado en la solicitud y posibles impactos no previstos, el sector o sectores sobre los que tendrán impacto los resultados y actividades realizadas en el proyecto que puedan dar lugar a transferencia de conocimiento.

Este apartado debe ser cumplimentado por el proyecto que coordina, pero debe incluirse también en los informes de los subproyectos que forman parte del proyecto coordinado

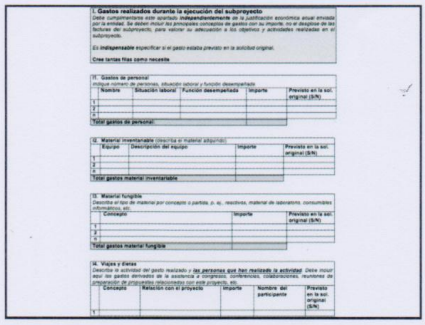
H1. Principal impacto derivado en el proyecto

H2. Impacto no previsto derivado del proyecto

H3. Sector de impacto de los resultados del proyecto: industria, administración, política, aumento del conocimiento, salud, medioambiente,...

H4.¿Cuenta con socios que puedan explotar los resultados?

H5. ¿Qué actividades del proyecto pueden generar valorización y transferencia del conocimiento?



I. Gastos realizados durante la ejecución del subproyecto

*Debe cumplimentarse este apartado **independientemente** de la justificación económica anual enviada por la entidad. Se deben incluir los principales conceptos de gastos con su importe, no el desglose de las facturas del subproyecto, para valorar su adecuación a los objetivos y actividades realizadas en el subproyecto.*

*En **indispensable** especificar si el gasto estaba previsto en la solicitud original.*

Cree tantas filas como necesite

I1. Gastos de personal

Indique número de personas, situación laboral y función desempeñada

	Nombre	Situación laboral	Función desempeñada	Importe	Previsto en la sol. original (S/N)
1					
2					
n					

Total gastos de personal:

I2. Material inventariable *(describa el material adquirido)*

Equipo	Descripción del equipo	Importe	Previsto en la sol. original (S/N)
1			
2			
n			

Total gastos material inventariable

I3. Material fungible

Describa el tipo de material por conceptos o partidas (p. ej., reactivos, material de laboratorio, consumibles informáticos, etc.

	Concepto	Importe	Previsto en la sol. original (S/N)
1			
2			
n			

Total gastos material fungible

I4. Viajes y dietas

*Describa la actividad del gasto realizado y **las personas que han realizado la actividad**. Debe incluir aquí los gastos derivados de la asistencia a congresos, conferencias, colaboraciones, reuniones de preparación de proyectos relacionados con este proyecto, etc.*

	Concepto	Relación con el proyecto	Importe	Nombre del participante	Previsto en la sol. original (S/N)
1					

6

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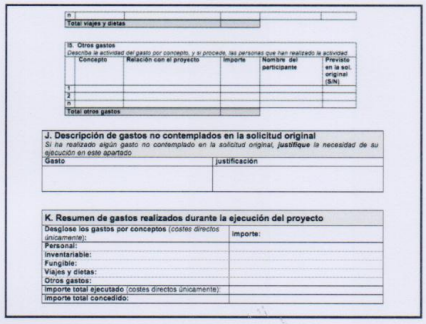
11/03/2018



n					
Total viajes y dietas					

15. Otros gastos
Describa la actividad del gasto por concepto, y si procede, las personas que han realizado la actividad

	Concepto	Relación con el proyecto	Importe	Nombre del participante	Previsto en la sol. original (S/N)
1					
2					
n					
Total otros gastos					

J. Descripción de gastos no contemplados en la solicitud original
Si ha realizado algún gasto no contemplado en la solicitud original, justifique la necesidad de su ejecución en este apartado

Gasto	Justificación

K. Resumen de gastos realizados durante la ejecución del proyecto

Desglose los gastos por conceptos (costes directos únicamente):	Importe:
Personal:	
Inventariable:	
Fungible:	
Viajes y dietas:	
Otros gastos:	
Importe total ejecutado (costes directos únicamente)	
Importe total concedido:	

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ANNEXES 2:

F. MAATOUK

UCA Universidad de Cádiz

FACULTAD DE CIENCIAS DEL MAR Y AMBIENTALES

Trabajo Fin de Grado (TFG)

Acto de Defensa de Trabajo Fin de Grado
(Convocatoria de Febrero de 2018)

Grado en Ciencias del Mar

Se les convoca al acto de Defensa de Trabajo Fin de Grado que tendrá lugar el próximo **viernes 23 de Febrero de 2018**, en el lugar y horario que a continuación se detalla:

Tribunal evaluador 1:

José Antonio Muñoz Cueto (Presidente)
Vanessa Ripoll Morales
Laura del Río Rodríguez (Secretaria)

Lugar Tribunal: AULA A.00.01 DEL CASEM (pala A, planta baja)

Hora defensa	Alumno/a	
10:00 – 10:30	Teresa Montaño Barroso	Evolución de las capturas de atún rojo (*Thonnus thynnos*) y perspectivas de futuro.
10:30 –11:00	Andrea Reboredo Barrios	Dieta del atún rojo, *Thonnus thynnos* (Linnaeus, 1758), en el Estrecho de Gibraltar.
11:00 – 11:30	Antonio José Sánchez Sánchez	Estudio de la dieta de dos especies del género Trachurus en el Golfo de Cádiz.

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UCA Universidad de Cádiz

FACULTAD DE CIENCIAS DEL MAR Y AMBIENTALES

Trabajo Fin de Grado (TFG)

Acto de Defensa de Trabajo Fin de Grado
(Convocatoria de Febrero de 2018)

Grado en Ciencias Ambientales

Se les convoca al acto de Defensa de Trabajo Fin de Grado que tendrá lugar el próximo **viernes 23 de Febrero de 2018**, en el lugar y horario que a continuación se detalla:

Tribunal evaluador 3:

Laureana Rebordinos Gonzalez (Presidenta)
Estrella Espada Bellido
Rocío Ponce Alonso (Secretaria)

Lugar Tribunal: AULA B.01.26 DEL CASEM (pala B, primera planta)

Hora defensa	Alumno/a	
10:00-10:30	Trinidad Cruces Romano	Uso de técnicas moleculares para el estudio de levaduras de fermentación en el último estadio de la fermentación.
10:30-11:00	Marina Delgado Gómez	Estandarización de la metodología de determinación de la enzima Glutatión S-transferasa (GST) para su uso como biomarcador de riesgo ambiental en la tortuga marina (*Chelonia mydas*).
11:00-11:30	Francisco Javier Esquivel Dabrio	Evaluación del Potencial Eólico en el Campus de Puerto Real.

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UCA Universidad de Cádiz

FACULTAD DE CIENCIAS DEL MAR Y AMBIENTALES

Trabajo Fin de Grado (TFG)

Acto de Defensa de Trabajo Fin de Grado
(Convocatoria de Febrero de 2018)

Doble Grado en Ciencias del Mar y Ciencias Ambientales

Se les convoca al acto de Defensa de Trabajo Fin de Grado que tendrá lugar el próximo **viernes 23 de Febrero de 2018**, en el lugar y horario que a continuación se detalla:

Tribunal evaluador 1:

José Antonio Muñoz Cueto (Presidente)
Vanessa Ripoll Morales
Gloria Peralta González
Laura del Río Rodríguez (Secretaria)

Lugar Tribunal: AULA A.00.01 DEL CASEM (pala A, planta baja)

Hora defensa	Alumno/a	
11:30-12:10	Robin Love	Optimization of the culture of the red alga *Chodracanthus teedei*. Effects of irradiance, temperature, salinity and nutrient enrichment.

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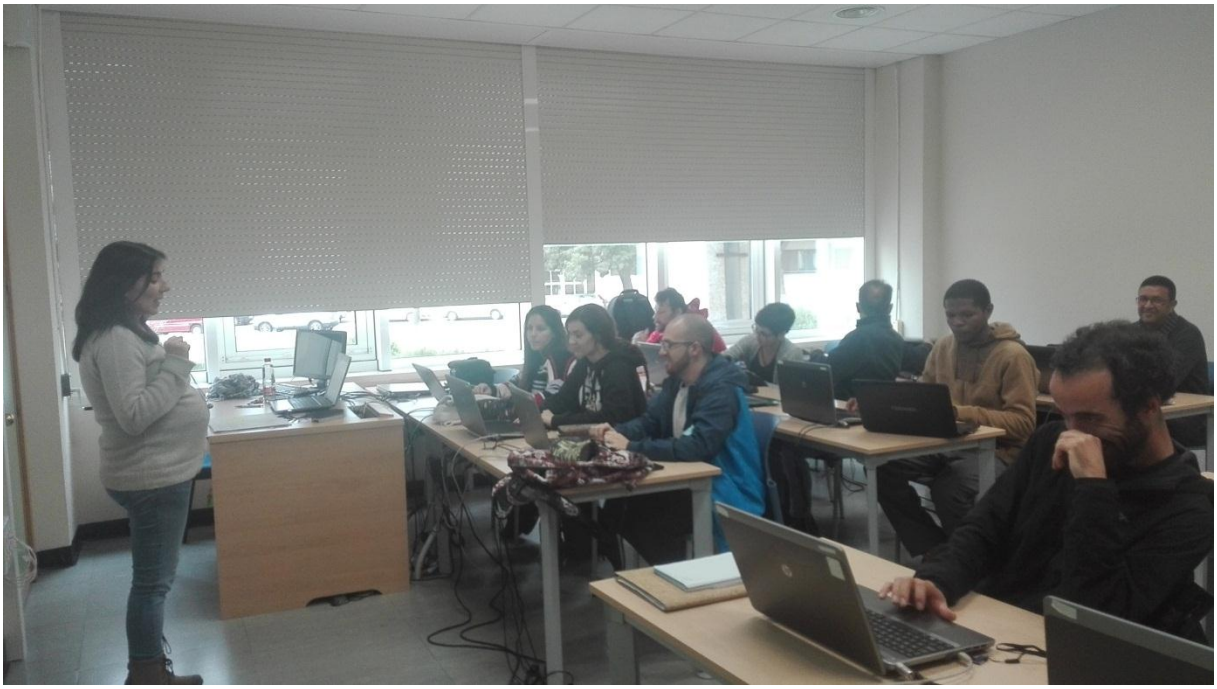
ANNEXES 3: Photos



Photos in the room of the practical work of Prof. Professor Laura Del RIO RODRIGUEZ

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	**GIS applied to Integrated Coastal Zone Management**
Thematic(s)	GIS applied to Integrated Coastal Zone Management
Type of module *(Select one or more boxes)*	☒ Lecture course ☒ Tutorial exercice ☒ Practical exercice ☐ Group workshop ☐ Field trip ☐ Other – precise:

Teaching manager	Laura Del RIO RODRIGUEZ & Ana MARCIAS
Speakers *(Precise if external speakers)*	Mustapha MAATOUK

Year / Semester	2
Number of hours	60 hours
Number of groups	1

Objectives	Knowing that 80% of the information on the Earth has a geographical component, geographic information systems (GIS) have become indispensable tools in several fields of application (natural resources management, natural hazards, aquaculture ...). This module will focus on the use of GIS to assess and map changes in the coastal zone (erosion, submersion,). In addition, a course in GIS software (most used in Moroccan and international organizations), then mini-projects for application to data in the coastal environment will enable learners to concretely address the use of GIS software. these cartographic tools in the field to which they are destined: ☞ Provide students with the basic knowledge needed to understand GIS concepts. Although very rich in theoretical knowledge, this course is based on practical examples and demonstrations; ☞ Make discover the variety: ▪ S.I.G. applications in different areas and specifically in the field of coastal zone management; ▪ Data used (cartography, aerial photographs, alphanumeric, ...); ▪ Software used to capture and manipulate geographic information.

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Content	**I.** The basic concepts of GIS ▪ Introduction to S.I.G. : ✓ Notion of Geographic Information; ✓ Birth and development of the concept of S.I.G. ✓ Concepts of geodesy and projection systems; ✓ Overview of applications and organizations involved in different areas of use of S.I.G. : the environment, urban management and Rural, integrated management of coastal areas ... ▪ Representation and structuring of the data: ✓ Modes of representation of the data; ✓ Principles of representation and management of data in raster mode and in vector mode; **II.** The specific functions of the S.I.G. ▪ Acquisition; ▪ Data management; ▪ Manipulation; ▪ Treatments; ▪ Restitution; **III.** Practical work: ▪ Getting started with GIS software: ✓ Consultation of a geographical database; ✓ Calibration and georeferencing of a scanned map; ✓ Vector creation; ▪ Planning a GIS project: ✓ Identify the objectives of the project; ✓ Create a database specific to the project; ✓ Use GIS functions to create an analytical model to solve the problem ; ✓ Present the results of the analysis. ▪ Case studies: ✓ *Analysis of changes in the shore line short and medium term;* ✓ *Study of compatibility of activities with the regulations;* ✓ *Study of the vulnerability of coastal systems through indices;* ✓ *Assessment of the effects of storms in coastal areas;* ✓ *Calculation flooding Sea level rise;* ✓ *Assessment of the effects of storms in coastal areas;* ✓ *Web-mapping for the evaluation of water quality and risks in the area of the Bay of Tánger :* - *First part: algae bloom*; - *Second part: coastal risk and vulnerability;* - *Third part: publication of the data in the network with ArcGis online*.
Teaching methods	1. Lecture in the form of PowerPoint presentation and printed document; 2. Practical work in the computer room using two GIS software (ArcGIS and QGIS); 3. Mini-projects: projects (real CPS) will be given to the learners; 4. Field trip: maps, images and GPS will be made available to learners.
Knowledge required	This module must be programmed after the major modules directly related to the title of the training on the one hand and secondly after the remote sensing module which represents the acquisition of digital information for GIS.
Skills required	
Equipment required	ArcGIS and QGIS Software

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Type of evaluation *(Select one or more boxes)*	☒ Oral – precise: ☒ Written – precise: ☒ Other – precise:
Comments on evaluations *(Precisions on criteria)*	1. Continuous control: 40% ; 2. Projects: 20%; 3. Practical activity: 40% (20% for both reports and 20% for oral presentations).

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of the European Union

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[08/march/2018]** till **[16/march/2018]**
Duration (days) – excluding travel days: 09 days

The Staff Member

Last name (s)	BEJJAJI	First name (s)	Zohra
Nationality	Moroccan	Academic Year	2017 - 2018
Position	Professor		
E-mail address	sdchakiri@gmail.com		

The sending university

Name	Ibn Tofail - Kénitra
Faculty/Department	Faculty of Sciences
Address	Ibn Tofail University, Faculty of Sciences, Department of Geology, BP 133, 14000, Kenitra, Morocco
Country	Morocco

Contact person

First/Last name(s)	AIT FORA Abderrahman
Position	Professor, ScolaMAR coordinator at the Ibn Tofail University of Kenitra

The receiving university

Name	University of Cadiz
Faculty/Department	Facultad de Ciencias del Mar y Ambientales
Address	Facultad Ciencias del Mar y Ambientales, Edifidio CASEM, Campus Universitario de Puerto Real, 11510, Puerto Real
Country	Spain

Contact person

First/Last name(s)	ANFUSO Giorgio and ECHEVARRIA Fidel
Position	ANFUSO Giorgio :Professor, ECHEVARRIA Fidel: Professor and ScolaMAR coordinator at the University of Cadix

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[08/march/2018]** till **[16/march/2018]**
Duration (days) – excluding travel days: 09 days

The Staff Member

Last name (s)	BOUABDLI	First name (s)	Abdelhak
Nationality	Moroccan	Academic Year	2017 - 2018
Position	Professor		
E-mail address	sdchakiri@gmail.com		

The sending university

Name	Ibn Tofail - Kénitra
Faculty/Department	Faculty of Sciences
Address	Ibn Tofail University, Faculty of Sciences, Department of Geology, BP 133, 14000, Kenitra, Morocco
Country	Morocco

Contact person

First/Last name(s)	AIT FORA Abderrahman
Position	Professor, ScolaMAR coordinator at the Ibn Tofail University of Kenitra

The receiving university

Name	University of Cadiz
Faculty/Department	Facultad de Ciencias del Mar y Ambientales
Address	Facultad Ciencias del Mar y Ambientales, Edifidio CASEM, Campus Universitario de Puerto Real, 11510, Puerto Real
Country	Spain

Contact person

First/Last name(s)	ANFUSO Giorgio and ECHEVARRIA Fidel
Position	ANFUSO Giorgio :Professor, ECHEVARRIA Fidel: Professor and ScolaMAR coordinator at the University of Cadix

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[08/march/2018]** till **[16/march/2018]**
Duration (days) – excluding travel days: 09 days

The Staff Member

Last name (s)	CHAKIRI	First name (s)	Saïd
Nationality	Moroccan	Academic Year	2017 - 2018
Position	Professor		
E-mail address	sdchakiri@gmail.com		

The sending university

Name	Ibn Tofail - Kénitra
Faculty/Department	Faculty of Sciences
Address	Ibn Tofail University, Faculty of Sciences, Department of Geology, BP 133, 14000, Kenitra, Morocco
Country	Morocco

Contact person

First/Last name(s)	AIT FORA Abderrahman
Position	Professor, ScolaMAR coordinator at the Ibn Tofail University of Kenitra

The receiving university

Name	University of Cadiz
Faculty/Department	Facultad de Ciencias del Mar y Ambientales
Address	Facultad Ciencias del Mar y Ambientales, Edifidio CASEM, Campus Universitario de Puerto Real, 11510, Puerto Real
Country	Spain

Contact person

First/Last name(s)	ANFUSO Giorgio and ECHEVARRIA Fidel
Position	ANFUSO Giorgio :Professor, ECHEVARRIA Fidel: Professor and ScolaMAR coordinator at the University of Cadix

Co-funded by the Erasmus+ Programme of the European Union

Type of mobility

☐ Technical skills
☒ Innovative pedagogical approaches

MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Mobility within the University of Cadiz is part of the ScolaMar project objectives. The main objectives are to set up a specialized master's degree on the coastal environment. The goal is to design a module that fits into the framework of the theme of the master. Training in this direction is an important goal for our university

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	March 8th 2018	We were a team of four teachers (Saïd Chakiri, Zohra Bejjaji, Abdelhak Bouabdli and Abdelkarim El Arrim). The course, which should start on March 5th, was delayed by three days because of the bad weather and therefore the total stop of navigation between Tangier and Spain. So we arrived at Cadiz March 7th in the evening. March 8th, we make contact with the "manager" (Giorgio Anfuso) who welcomed us and made us visit the various departments in which we can work. First meeting allowed us to adopt a work plan for the continuation of the mission. A room equipped with internet has been made available to us.
2	March 9th 2018	Professor Giorgio Anfuso has made available to us all documents related to the training of the three masters accredited at the University of Cadiz and in relation with the ScolaMar project theme. Prof. Giorgio Anfuso put us in touch with the coordinators of the masters. Meetings with them were progressed for the following week.
3	March 102018	Working session between four mobility-friendly professors to discuss the content and architecture of the three masters of the University of Cadiz
4	March 11 2018	Discovery of protective installations installed in the coastal area of the city of Cadiz.
5	March 12 2018	Meeting with Mrs Ana María Macías Bedoya, head of the master entitled: gestión Integrada de áreas litorales. The discussion focused on the architecture of the master and on the teaching and internship modalities.
6	March 13 2018	A meeting with Mr. Gonzalo Muñoz Arroyo, responsible for the master entitled: conservación y gestión del medio natural The master's coordinator explained the objectives of the master's degree, the teaching methods for each semester, and examples of end-of-studies projects offered to students.

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7	March 14 2018	Taking inspiration from the three masters accredited at the University of Cadiz and who have affinities with the theme of the ScolaMar project, we have worked on module proposals to integrate them into the ScolaMar project master. Three modules were chosen: coastal silting phenomena, coastal erosion and erosion control techniques and the impact of quarries on the coastal ecosystem
8	March 15 2018	Preparation of the objectives, content and teaching methodology of the modules that we proposed for the ScolaMar project master.
9	March 16 2018	Preparation of the objectives, content and teaching methodology of the modules that we proposed for the ScolaMar project master.

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

The internship carried out at the University of Cadiz allowed to acquire a methodology on practical activities programmed in our modules especially those targeted on visits of the littoral zones. For our University, because of its geographical position similar to that of Cadiz (present in a coastal zone), the implementation of a research strategy in the coastal area will be supported by agreements between the two institutions and the ScolaMar program will be a platform for future collaborations.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

In order to disseminate the results; internal meetings by proposing future action plans followed by reports.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

PEDAGOGICAL TOOL-KIT
Teaching module

Module title	**Erosion littorale et techniques de lutte antiérosive**
Thematic(s)	Impact et réhabilitation du littoral
Type of module *(Select one or more boxes)*	☒ Lecture course ☐ Tutorial exercice ☐ Practical exercice ☐ Group workshop ☐ Field trip ☐ Other – precise:

Teaching manager	BEJJAJI Zohra
Speakers *(Precise if external speakers)*	Zohar Bejjaji, Mohamed Allouza, Saïd Chakiri

Year / Semester	1ème Année, Semestre 2
Number of hours	50H
Number of groups	02

Objectives	- Acquisition des notions approfondies sur les phénomènes de l'érosion littorale - Evaluation de l'impact de cette érosion sur l'évolution de la morphologie côtière - Présentation des techniques de lutte antiérosive (techniques biologiques et mécaniques)

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Content	**Cours :** Seront traités dans ce module : - les différents processus d'érosion et les phénomènes associés (dégradation de l'écosystème) - les facteurs d'érosion des cordons littoraux - les zones les plus exposées aux risques d'érosion - les différentes techniques de la lutte antiérosive (techniques biologiques, techniques mécaniques, techniques culturales, etc.) - les domaines d'application de ces techniques de la lutte anti-érosive - la gestion des risques d'érosion littorale (stratégies et programmes de la lutte, prévention). **Travaux pratiques :** - les techniques de cartographie des phénomènes d'érosion (détermination des facteurs et des processus d'érosion de la zone littorale) - analyse et interprétation des cartes topographiques, pédologiques et géotechniques dans l'étude du phénomène. **Sortie sur le terrain** - visite de zones exposées aux phénomènes d'érosion littorale (cas de la façade atlantique entre Kénitra et Moulay Bouselham) - cartographie des phénomènes d'érosion observés sur le terrain - observation des techniques de lutte antiérosive proposées dans les zones visitées
Teaching methods	Les méthodes de l'enseignement seront basées sur des supports didactiques (polycopiés du cours et des travaux dirigés, un support PPT). L'activité pratique sera basée sur des visites de la frange littorale de la région du Gharb.
Knowledge required	Avoir des notions en sédimentologie marine et en cartographie
Skills required	Etre à la mesure de faire du terrain et avoir le sens d'analyse et d'interprétation des données.
Equipment required	Ordinateurs, logiciel de granulométrie, GPS, cartes topographiques et géologiques)
Type of evaluation *(Select one or more boxes)*	☒ Oral – precise: ☒☐ Written – precise: ☒ Other – precise: Rapport de terrain
Comments on evaluations *(Precisions on criteria)*	- En fin du semestre, la note minimale requise pour la validation du module est 10 sur 20. L'étudiant n'ayant pas validé le module est autorisé à passer un contrôle de rattrapage pour ce module si la note de ce module n'est pas strictement inférieure à 05 sur 20. Le contrôle de rattrapage s'effectue selon les mêmes modalités que l'examen de fin de semestre. L'étudiant garde la note supérieure entre la note obtenue à l'issue du rattrapage et celle obtenue avant le rattrapage. Lorsque l'étudiant a validé un module à l'issue du contrôle de rattrapage, il conserve la note obtenue, avec la mention «validé après rattrapage» sur le relevé de note (CNPN). Un module dont la moyenne est supérieure ou égale à 7 sur 20 peut être validé par compensation annuelle, si l'année dont fait partie ce module est validée (CNPN).

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title **Thematic(s)**	**Impact des carrières sur l'écosystème littoral** Environnement
Type of module *(Select one or more boxes)*	Lecture course and Group workshop
Teaching manager **Speakers** *(Precise if external speakers)*	BOUABDLI ABDELHAK
Year / Semester	second year / first semestre
Number of hours **Number of groups**	50 h 2
Objectives	In this module, the student must acquire the methods of analysis and study of quarries established in the littoral zone and their impact on the ecosystems and the balance of the dunes.
Content	course: The course will treat: - classification of sand quarries - career exploration techniques - the different types of exploitation - the characteristics of the sands - the impacts of the exploitation on the environment - the techniques of rehabilitation of abandoned quarries Field trip - visit of quarries being exploited in the coastal zone of the Gharb region - visit of abandoned quarries with a view to their rehabilitations
Teaching methods	majistraux course field trips
Knowledge required	Notions on coastal geology
Skills required **Equipment required**	have training in: in classification of sand quarries and exploration techniques and how to rhebilitate abandoned quarries
Type of evaluation *(Select one or more boxes)*	Written: Semester Examination: Terminal Control + Practical Activities Other : Continuous tests: specify (tests, oral tests, homework, lectures, internship reports or other means of control): written tests at the beginning of the session
Comments on evaluations *(Precisions on criteria)*	Evaluation methods will be based on continuous controls (two continuous controls), release reports and final examination

PEDAGOGICAL TOOL-KIT
Teaching module

Module title	**Phénomènes d'ensablement littoral**
Thematic(s)	Impact et réhabilitation du littoral
Type of module *(Select one or more boxes)*	☒ Lecture course ☐ Tutorial exercice ☐ Practical exercice ☐ Group workshop ☐ Field trip ☐ Other – precise:

Teaching manager	CHAKIRI Saïd
Speakers *(Precise if external speakers)*	Saïd Chakiri, Mohamed Allouza, Zohar Bejjaji

Year / Semester	2ème Année, Semestre 3
Number of hours	50H
Number of groups	02

Objectives	L'étudiant doit acquérir les méthodes d'analyse et d'étude des phénomènes d'ensablement littoral. Ce module traitera les principaux risques liés directement aux risques de mobilité des sables dans les zones littorales. Les définitions, les causes, les enjeux, les conséquences et la gestion de ces risques seront abordés.
Content	**Cours :** Le cours traitera : - l'organisation géomorphologique et géologique de la zone littorale - les facteurs de prédisposition de l'ensablement - les différents processus d'ensablement - les phénomènes d'ensablement - les techniques d'évaluation des risques d'ensablement - la gestion des risques d'ensablement (**stratégie et mesures d'atténuation des effets, luttes, prévention, etc.).** **Travaux pratiques :** - techniques de cartographie des zones à risque d'ensablement - utilisation des cartes topographiques, géologiques et géotechniques pour l'analyse des phénomènes d'ensablement **Sortie sur le terrain** - étude du phénomène de l'ensablement littoral dans la région du Gharb - observation et interprétation des facteurs régissant le phénomène d'ensablement sur le terrain - cartographie des phénomènes observés sur le terrain

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Teaching methods	Les méthodes de l'enseignement seront basées sur des supports didactiques (polycopiés du cours et des travaux dirigés, un support PPT). L'activité pratique sera basée sur des visites de la frange littorale de la région du Gharb dont l'objectif est de permettre à l'étudiant de voir sur place les différents phénomènes d'ensablement et de réaménagement ainsi que les techniques utilisées pour les luttes contre ce phénomène. L'étudiant doit présenter un rapport comprenant toutes les observations de terrain.
Knowledge required	Notions en géomorphologie, en cartographie et en géologie générale
Skills required	Etre à la mesure de faire du terrain et avoir le sens d'analyse et d'interprétation des données.
Equipment required	Matériel de laboratoire (tamiseuse, ordinateurs, logiciel de granulométrie, GPS, cartes topographiques et géologiques)
Type of evaluation *(Select one or more boxes)*	☒ Oral – precise: ☒☐ Written – precise: ☒ Other – precise: Rapport de terrain
Comments on evaluations *(Precisions on criteria)*	- Examen final : 50% - Travaux pratiques et rapports des sorties : 30% - Contrôles continus : 20% - En fin du semestre, la note minimale requise pour la validation du module est 10 sur 20. L'étudiant n'ayant pas validé le module est autorisé à passer un contrôle de rattrapage pour ce module si la note de ce module n'est pas strictement inférieure à 05 sur 20. Le contrôle de rattrapage s'effectue selon les mêmes modalités que l'examen de fin de semestre. L'étudiant garde la note supérieure entre la note obtenue à l'issue du rattrapage et celle obtenue avant le rattrapage. Lorsque l'étudiant a validé un module à l'issue du contrôle de rattrapage, il conserve la note obtenue, avec la mention «validé après rattrapage» sur le relevé de note (CNPN). Un module dont la moyenne est supérieure ou égale à 7 sur 20 peut être validé par compensation annuelle, si l'année dont fait partie ce module est validée (CNPN).

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **08/03/2018** till 13/03/2018
Duration (days) – excluding travel days: 6 days

The Staff Member

Last name (s)	EL ARRIM	First name (s)	Abdelkrim
Nationality	Moroccan (Morocco)	AcademicYear	2018 - 2019
Position	Professor		
E-mail address	elarrimk@yahoo.fr		

The sending university

Name	Abdelmalek Essaadi University
Faculty/Department	Faculty of Sciences & Technicals of Tangier/Geological department
Address	BP 416. Tangier
Country	Morocco

Contact person

First/Last name(s)	EL ARRIM Abdelkrim
Position	Professor

The receiving university

Name	Dr Giorgio Anfuso/ University of Cadiz
Faculty/Department	Faculty of Sciences/Geological department
Address	University of Cádiz Faculty of Marine and Environmental Sciences Centro Andaluz Superior de Estudios Marinos (CASEM), Campus Universitario Río San Pedro, 11510-Puerto Real, Cádiz
Country	Spain

Contact person

First/Last name(s)	Dr Giorgio Anfuso
Position	Professor

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Type of mobility

xTechnical skills
☐Innovative pedagogical approaches

MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The Job Shadowing carried out at the University of Cádiz as part of the ScolaMAR project aims to gain knowledge of the programs of the three accredited masters to the University of Cadiz whose programs are close to those targeted by the ScolaMAR project (Conservation and management of natural environments, Integrated Coastal Zone Management (ICGM) and oceanography).
We therefore aim to hold meetings with the leaders of the three masters to discuss the similarities of the modules related to the modules proposed in the Master in preparation under the ScolaMAR project.
Our goal is also to see the teaching methods and didactic tools used in teaching courses and practical activities in the university of Cadiz.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons,meetings, trainings, conferences, field trips)

Day	Dates	Description
1	08/ 03/2018	**9: 30-10: 30 :** Lectures course "Environment, Economy and Society" from the Degree in Environmental Sciences (Prof. Ana Macías). Room B.00.10 CASEM. **11: 30-12: 30 :** Lectures course "Marine Engendering (specifically on the Coastal Storms and Sea Level Rise)" from the Degree in Marine Sciences (Prof. Giorgio Anfuso). Room A.00.03 CASEM.
2	12/03/2018	**10: 30-11: 30:** Lectures course "Environment, Economy and Society" from the Degree in Environmental Sciences (Prof. Ana Macías). Room B.00.10 CASEM.

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		11: 30-12: 30: Lectures course "Natural Hazards" from the Degree in Environmental Sciences (Prof. Laura del Río). Room B.00.07 CASEM.
3	13/03/2018	**10:30-11:30 :** Lectures course "Environment, Economy and Society" from the Degree in Environmental Sciences (Prof. Ana Macías). Room B.00.10 CASEM. **11:30-13:30:** Lectures course "Natural Hazards" from the Degree in Environmental Sciences (Prof. Laura del Río). Room B.00.07 CASEM.

Add linesto the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

The Job Shadowing carried out at the University of Cádiz will bring certainly an added value to my teachting modules by the benchmark with process of teachting at the the University of Cádiz especialy the modules of Conservation and management of natural environments, Integrated Coastal Zone Management (ICGM) and oceanography). , to my university by the benchmark with teaching methods and didactic tools used in teaching courses and practical activities in the university of Cadiz and to the ScolaMar project by discussion of similarities of the modules related to the modules proposed in the Master in preparation under the ScolaMAR project.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) –Precise

The result of my mobility will be disseminated by sending a report to the receiving university and Our university.
In the added, we will prepar a Conference on climat change, between 18 and 20 Avril 2018 at University of Ibn Tofail in Kenitra in Morocco, and will invite all the team of project ScolaMar to participate.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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PEDAGOGICALTOOL-KIT
Teaching module

Module title	INTEGRATED MANAGEMENT OF COASTAL AREAS AND SUSTAINABLE DEVELOPMENT
Thematic(s)	COASTAL DYNAMICS
Type of module *(Select one or more boxes)*	X Lecture course ☐Tutorial exercice X Practical exercice ☐Group workshop ☐ Field trip ☐Other – precise:

Teaching manager	PR. ABDELKRIM EL ARRIM
Speakers *(Precise if external speakers)*	PR. ABDELKRIM EL ARRIM

Year / Semester	2018 SECOND SEMESTER
Number of hours	56 HOURS
Number of groups	4 GROUPS

Objectives	COASTAL AREAS FACE MULTIPLE SOURCES OF NUISANCE AND POLLUTION, RELATED TO THE IMPORTANCE OF ECONOMIC DEVELOPMENT IN THESE AREAS, INCLUDING TOURISM, URBANIZATION, FISHERIES, INDUSTRY AND TOURISM AND OTHER. THIS MODULE PRESENTS THE MAIN ELEMENTS OF INTEGRATED COASTAL ZONE MANAGEMENT, AS AN APPROACH THAT CAN PRESENT SOLUTIONS FOR SUSTAINABLE COASTAL MANAGEMENT. IT MAKES IT POSSIBLE TO UNDERSTAND THE CONTEXT, THE CONCEPTUAL FRAMEWORK AND THE STAKES OF THE INTEGRATE MANAGEMENT OF COASTAL AREAS AND THE PROBLEM OF MANAGEMENT OF THE MOROCCAN LITTORAL, A VULNERABLE AND OVEREXPLOITED ENVIRONMENT.

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Content	Course: I- Introduction to integrated coastal zone Management II-Conceptual framework III- Practices for Integrated Coastal Zone Management IV- Issues of integrated coastal zone Management V- The determining factors of integrated coastal zone Management VI- Tools of integrated coastal zone management a. Geographic information system b. Environmental impact assessment c. Sustainability analysis TD: • Various actions carried out in the Moroccan Mediterranean • Action Plan for the Mediterranean • Coastal Development Programs Project Morocco • Field trip: Tangier and Tetouan coastals. TP : Analytical techniques and methods: • Analysis of aerial photos and multi-date satellite images; • Geo-location / GPS; • Digitization of the coastline; • Application of geomatics to coastline evolution: perform beach profiles using a total station (field application).
Teaching methods	Several methods of analysis will be used to reach the objectives of the teaching of this module : the application of geomatic tools for a better management of the coastal zones ... The students in groups of 4, will have to prepare a work on integrated coastal zone management tools and present it to analyze the different cases.
Knowledge required	Cartography - General geology, Informatics, Environment.
Skills required	GEOMATIC
Equipment required	TOPOGRAPHIC EQUIPMENTS : TOTAL STATION, GPS, ALTIMETRIC LEVEL
Type of evaluation *(Select one or more boxes)*	☐Oral – precise: X Written – precise: ☐Other – precise: Practical work
Comments on evaluations *(Precisions on criteria)*	The validation of the module is done by a note superior or equal to 10

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **31/03/2018** till **14/04/2018.**
Duration (days) – excluding travel days: **13**

The Staff Member

Last name (s)	ZOURARAH	First name (s)	BENDAHHOU
Nationality	MAROCAINE	Academic Year	2017 - 2018
Position	Enseignant Chercheur/PES		
E-mail address	zourarah@gmail.com		

The sending university

Name	Université Chouaib Doukkali
Faculty/Department	Faculté des Sciences/ Département de Géologie
Address	BP 20, 24000 El Jadida, MAROC
Country	Maroc

Contact person

First/Last name(s)	BENDAHHOU ZOURARAH
Position	Enseignant Chercheur/PES

The receiving university

Name	University of Cadiz (UCA)
Faculty/Department	Faculté des sciences de la mer et de l'environnement
Address	Campus Río San Pedro, 11510 Puerto Real (Cádiz)
Country	Espagne

Contact person

First/Last name(s)	Fidel Echevarría
Position	Enseignant Chercheur

Type of mobility

☐ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **31/03/2018** till **14/04/2018.**
Duration (days) – excluding travel days: **13**

The Staff Member

Last name (s)	EL KHALIDI	First name (s)	KHALID
Nationality	MAROCAINE	Academic Year	2017 - 2018
Position	Enseignant Chercheur /PA		
E-mail address	elkhalidi_khalid@yahoo.fr		

The sending university

Name	Université Chouaib Doukkali
Faculty/Department	Faculté des Sciences/ Département de Géologie
Address	BP 20, 24000 El Jadida, MAROC
Country	Maroc

Contact person

First/Last name(s)	BENDAHHOU ZOURARAH
Position	Enseignant Chercheur/PES

The receiving university

Name	University of Cadiz (UCA)
Faculty/Department	Faculté des sciences de la mer et de l'environnement
Address	Campus Río San Pedro, 11510 Puerto Real (Cádiz)
Country	Espagne

Contact person

First/Last name(s)	Fidel Echevarría
Position	Enseignant Chercheur

Type of mobility

☐ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Dans le cadre du programme Scolamar, volet formation des formateurs, j'ai pu participer à un stage d'observation sur les méthodes pédagogiques pratiquées pour les étudiants des masters à l'université de Cadiz.
L'objectif principal de ma mission était de participer à l'apprentissage et la diffusion du savoir en matière des sciences exactes et plus précisément de pouvoir acquérir les techniques et les méthodes pédagogiques pratiquées par nos collègues à l'université de Cadiz.
Cette formation de formateurs m'a permis d'élargir mes compétences pédagogiques afin de mieux participer au Master pluridisciplinaire visant la formation d'un potentiel humain de haut niveau capable de relever les défis et réussir les challenges en matière des Sciences exactes, Sciences Juridiques, Economiques et Sociales de la mer (Life Science and Sustainable Blue Growth).
Ce Master sera monté conjointement par plusieurs universités marocaines dont la nôtre : Université Chouaib Doukkali, Facultés des Sciences, Département de Géologie, El Jadida.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	Samedi et Dimanche 31/03 et 01/04/2018	Départ d'El Jadida vers Cadiz
2	Lundi 02/04/2018	Réception à la faculté des sciences de la mer et de l'environnement par le professeur Fidel Echevarría et visite du campus universitaire. Présentation des différents masters étudiés à la faculté de cadiz.
3	Mardi 03/04/2018	Réception au campus universitaire par le professeur Anfuso Giorgio et discussion sur les cours qu'il assure sur la dynamique côtière. Préparation d'un programme de participation aux cours en collaboration avec les professeurs Fidel Echevarría et Anfuso Giorgio.
4	Mercredi 04/04/2018	Participation au cours « Évaluation de la valeur panoramique des côtes » assuré par le pr Anfuso Giorgio. Rencontre du pr Gonzalo munoz qui nous présenter le master « conservation et gestion des milieux naturelles » qui a pour objectif l'analyse et la gestion des espaces naturelles et la protection du patrimoine naturel.
5	Jeudi 05/04/2018	Rencontre du professeur Ana Macías Bedoya pour discuter sur le programme des cours du master « Gestion intégrée des zones côtières ».
6	Vendredi 06/04/2018	Rencontre avec le chargé de communication des masters spécialisés dans les domaines côtiers et discussion sur les étapes de préparation d'un master et les différentes collaborations avec les autres universités et les organismes publiques et privés.
7	Samedi 07/04/2018	Visite de la baie de Cadiz

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8	Dimanche 08/04/2018	Journée libre
9	Lundi 09/04/2018	Participation au cours assuré par le Pr Andrés Cózar Cabañas sur le logiciel STELLA (logiciel de modélisation graphique)
10	Mardi 10/04/2018	Participation au cours assuré par le Pr Andrés Cózar Cabañas sur le logiciel STELLA (logiciel de modélisation graphique)
11	Mercredi 11/04/2018	Participation au cours « Évaluation de la valeur panoramique des côtes » assuré par le pr Anfuso Giorgio.
12	Jeudi 12/04/2018	Participation au cours « Gestion intégrée des zones côtières » du professeur Ana Macías Bedoya.
13	Vendredi 13/04/2018	Rencontre des étudiants du Master « Gestion intégrée des zones côtières »le pr Anfuso Giorgio pour discuter l'objectif d'une mission sur les dépôts de Tsunami, la logistique et l'organisation de cette mission
14	Samedi 14/04/2018	Participation à une sortie de terrain animé par le pr Anfuso Giorgio sur les dépôts de Tsunami. Fin de journée : Retour au Maroc

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

Dans le cadre du projet ScolaMAR-Innovative training for Smart coastal management and Sustainable blue growt, ERASMUS PLUS Programme, nous avons participé aux activités pédagogiques avec des collègues espagnols : les professeurs Fidel Echevarría, Anfuso Giorgio, Gonzalo munoz, Ana Macías Bedoya et Andrés Cózar Cabañas.
Cet échange pédagogique m'a permis de découvrir quelques méthodes employées dans l'enseignement des étudiants des masters. A savoir, le montage d'un master en intégrant l'entourage socio-économique, le choix des cours en relation avec la thématique du master et enfin l'enseignement des modules en utilisant des techniques de communication innovantes.
Ces méthodes pédagogiques vont me permettre d'enrichir mon expérience en matière d'enseignement et elles vont m'aider à réussir le bon déroulement du module que je vais assurer au future master.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Ma mission à l'université de Cadiz a été une occasion pour discuter avec des collègues espagnole sur la mise en place du futur master au maroc et les possibilités d'échanges.
Le présent rapport sera envoyé, en copie, au coordonnateur du projet Scolamar au niveau de notre université.

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ANNEXES

Photos de la participation à une sortie de terrain animé par le pr Anfuso Giorgio sur les dépôts de Tsunami

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[day/month/year]** till **[day/month/year]**
Duration (days) – excluding travel days: ……

The Staff Member

Last name (s)	MOUNIR	First name (s)	HAKKOU
Nationality		AcademicYear	2017- 2018
Position	Professor		
E-mail address	m.hakkou@gmail.com		

The sending university

Name	University Mohammed V-Scientic institut
Faculty/Department	Earth sciences
Address	Av. Ibn Batouta, B.P 703, 10106 Rabat
Country	Morocco

Contact person

First/Last name(s)	Abdellah Ammar
Position	Professor

The receiving university

Name	University of Cadix
Faculty/Department	Earth sciences
Address	Cadix,
Country	Spain

Contact person

First/Last name(s)	Fidel Echavarria
Position	Professor

Type of mobility

☐Technical skills
☐Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Objective of mobility: training for coastal management and sustainable blue growth
project module: Oceanography and coastal risks

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons,meetings, trainings, conferences, field trips)

Day	Dates	Description
1	2/04/2018	- First contact with the professors of the cadiz university concerned by the scolamar project (Echavarria, Giorgio, Ana Macías Bedoya. - work in the room reserved for professors
2	3/04/2018	- Meeting with Anfuso Giorgio on courses given to students in the coastal area and other subjects dealing with the coastline. - work in the room reserved for professors
3	4/04/2018	- Take a course given by Anfuso Giorgio for master students (Evaluation of the scenic value of coasts) - work in the room reserved for professors
4	--/04/2018	- Meeting with Ana Macías Bedoya on courses given to students in the coastal area and other subjects dealing with the coastline. - work in the room reserved for professors
5	--/04/2018	- attend a presentation made by the communication officer on the organization of masters specialized in coastal studies. - work in the room reserved for professors
6	--/04/2018	- work in the room reserved for professors

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7	--/04/2018	- Take a course given for master students about STELA software - work in the room reserved for professors
8	--/04/2018	- Take a course given for master students about STELA software - work in the room reserved for professors
9	14/04/2018	- field trip with Anfuso Giorgio (recognition of Tsunami deposits)

Add linesto the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

I learned new topics for me such as the scenic value of coasts, the perspectives of the STELA software, and description of the tsunami deposits.

IMPACT

Howwill you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

- send a report to the Mohammed V university
- Send a report to Mr Ammar Abdellah

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[day/month/year]** till **[day/month/year]**
Duration (days) – excluding travel days: From 16th April to 29 April 2018

The Staff Member

Last name (s)	JAMÏ	First name (s)	Jihad
Nationality	Moroccan	Academic Year	2017- 2018
Position	Professor		
E-mail address	jamijihad@gmail.com		

The sending university

Name	Abdelmalek Essadi University
Faculty/Department	Faculty of Sciences And Technics of Tangier
Address	Ancienne Route de l'Aéroport, Km 10, Ziaten. BP : 416. Tangier
Country	Morocco

Contact person

First/Last name(s)	Dr. Bouchta EL MOUMNI
Position	Coordinator SCOLAMAR. Faculty of Sciences And Technics of Tangier

The receiving university

Name	The university of Cadiz – Spain
Faculty/Department	Escuela Politecnica Superior
Address	Avda. Ramón Puyol, s/n 11202 Algeciras (Cádiz)
Country	Spain

Contact person

First/Last name(s)	Fidel Echevarría
Position	Coordinator SCOLAMR. UCA. Spain

Type of mobility

☒ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Objectives of the mobility regarding the SCOLAMR project are :

- to train trainers to meet the growing needs of Professors capable of handling and promoting training and research in the fields of maritime and port Management.
- to provide skills that permit to design methodologies and solutions that can help mitigate and adapt to climate change in the Mediterranean and in Africa. (Respecting the legal codes, optimizing the logistics chain…).
- to train trainers through technical, pedagogical and integrative approaches and "Job-shadowing" mobility of Moroccan professors
- to allow the Moroccan partner-universities to face societal challenges by improving the employability of young adults.
- to observe, learn and work with European partners to master a pedagogical skill and methodology

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	Monday 16th April 2018	Arrived to the Escuela Politecnica Superior in Algeciras Contact Dr M. Del Mar CERBAN Visiting the Escuela and have a contact with the staff of the Escuela Preparing the Job Shadowing (Planning, Conferences/Courses planned, …) We Meet the research group at the Escuela who word with Dr M. Del Mar CERBAN *Lesson 1 :* El Contenedor : Reclamationes por Danos a las mercancías – A. Viillaescusa. APM Terminals (I) Calendario: Master Asignatura VI. Transporte Multimodal
2	Tuesday 17th April 2018	*Lesson 2 :* El Contenedor : Reclamationes por Danos a las mercancías – A. Viillaescusa. APM Terminals (I) Calendario: Master Asignatura VI. Transporte Multimodal
3	Wednesday 18th April 2018	*Lesson 3 :* Gestion financier de puertos – DC Pinto, Autoridad Portuaria Bahia de Algeciras Calendario: Master Asignatura VII 2. Gestion Portuaria
4	Thursday 19th April 2018	Exploring documentation on the database of the Escuela Politecnica Superior Studying the Report of economics impacts of the Algeciras port Searching on the Library on line Exploring papers related logistics and port competitiveness

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Day	Dates	Description
5	Friday 20th April 2018	*Lesson 4* : English applied to transport and Logistics
6	Monday 23th April 2018	*Lesson 5 :* El Régimen juridico del transporte Multimodal – Prof Dra. Maria Jesus Guerrero Lebron. Universidad Pablo de Olavide Calendario: Master Asignatura VI. Transporte Multimodal
7	Tuesday 24th April 2018	*Lesson 6 :* Transporte de pasajeros – C. Lopez ansorena, Autoridad Portuaria de Ceuta. Calendario: Master Asignatura VII 2. Gestion Portuaria *Lesson 7 :* Relaciones puertociudad – Prof dr M Arcila, Universidad de Cadiz Calendario: Master Asignatura VII 2. Gestion Portuaria *Lesson 7 Bis :* Almacenaje y mantenimiento de stocks – S Jiménez Calendario: Master Asignatura VII 1. Logistica del transporte
8	Wednesday 25th April 2018	*We visited the Mearsk Line company and have a short meeting with the CEO of the company in the port of Algeciras.* *We Visited the area of the port of Algeciras and seen the different terminals* *Lesson 8 :* Gestion comercial portuaria – G Landaluce, Autordad Portuaria Bahia de Algeciras. Calendario: Master Asignatura VII 2. Gestion Portuaria *Lesson 9 :* Red logística de Andalucía. El caso de la ZAL de la bahía de Algeciras – G Vilana. Calendario: Master Asignatura VII 1. Logistica del transporte
9	Thursday 26th April 2018	Meeting the coordinator - Fidel Echevarría in Cadiz Visiting some University buildings in Cadiz, including the Aula Universitaria del Estrecho (the office of the University in charge of the relationship with the Maghreb).
10	Friday 27th April 2018	Exploring the content of the program of the Master Universitario en Transporte Maritimo. Preparing the pedagogical tool kit Writing mobility and activity report of the job shadowing (for the second week)

Add lines to the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

The international mobility to the university of Cadiz, in the Escuela Politecnica Superior (from the 16th to 25th of april) and for the second period in the Campus of Puerto Real (from the 26th to 30th april) was a very good experience that added value for teaching module.

It gives me some pedagogical tools to teach and prepare the support and the content of module relating to Logistics Management in the port and Multimodal Transport field.
I have took a part of different courses planned during the period of the job shadowing, and Explored different papers related to the port management and multimodal transport in the database of the university

The value added was especially in terms of pedagogical skills and also the organization. I think that a multidisciplinary team had to be involved in the project of the master at our university Abdelmalek Essaadi. The experience in the Escuela Politecnica Superior was a good example for a multidisciplinary team coordinated by Dr Maria Del Mar Cerban. The team work together also in a group of research beside the activity of teaching.

Another point which is also important, that the participant in the master, and according this experience, should involve experienced professionals, in order to complete the pedagogical content of the professor, and also to give the students the practical, technical or soft skills they need.

Also, I think that visiting firms involved to maritime and port logistics beside teaching modules will be an added value to the student. It lets Master students aware about the port reality and the needs of the functions related to this field of global logistics.

Finally, I think that this experience in the Escuela Politecnica Superior (UCA) will permit a great exchange with research group in the field of Port Management and Multimodal Logistics

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

I will disseminate the result of my mobility by :
Meeting with coordinators of the program, sending the mobility report, sending the pedagogical tool kit and also teaching the module: Port management and multimodal transport and logistics.
And coordinating with the speakers (External teachers of the module)

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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Pictures

In Maersk Line (Algeciras) with Dr Maria Del Mar Cerban

With Dr. Fidel Echevarria

With Dr Fidel Echevarria and M. Jesus in the Aula Universitaria del Estrecho

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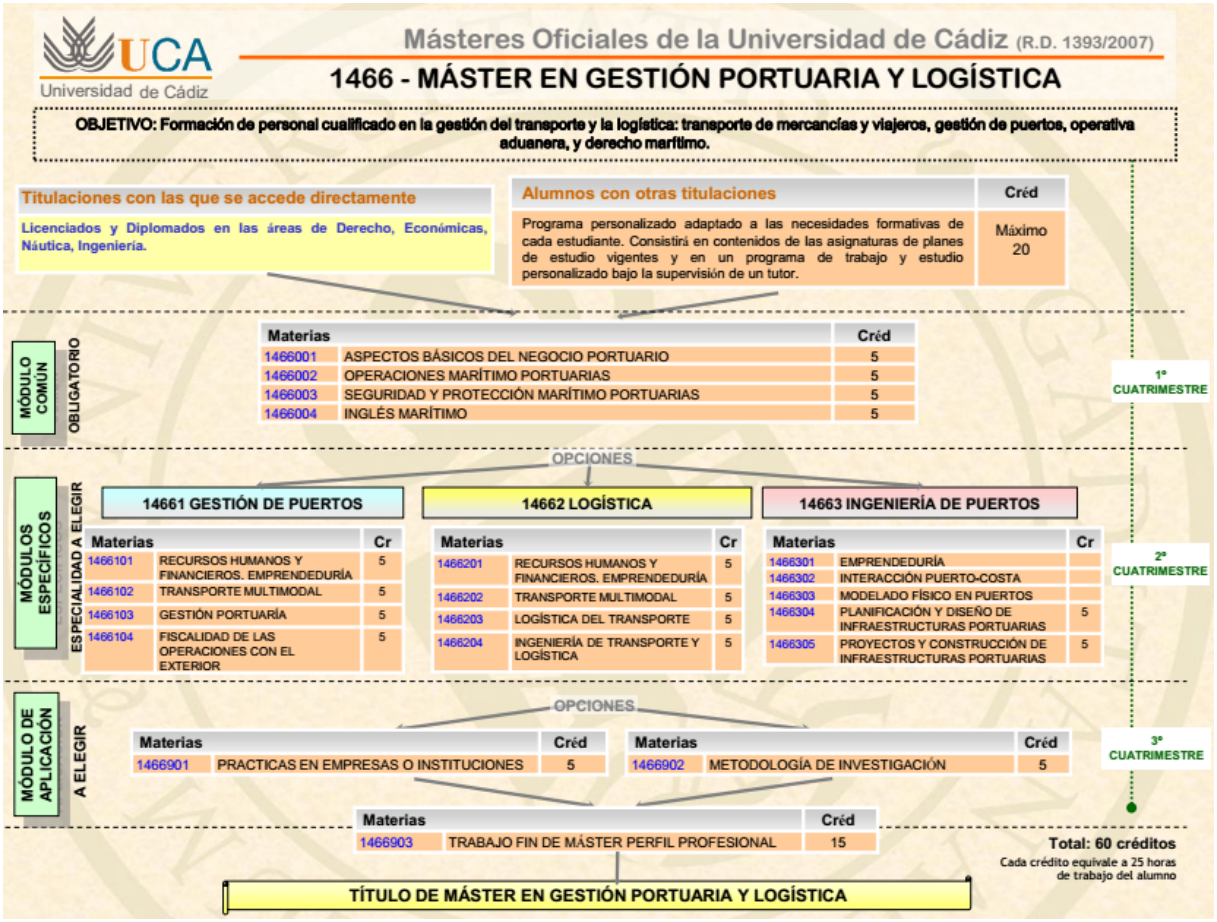
Documents

The first page of the document 1



Másteres Oficiales de la Universidad de Cádiz (R.D. 1393/2007)

1466 - MÁSTER EN GESTIÓN PORTUARIA Y LOGÍSTICA

OBJETIVO: Formación de personal cualificado en la gestión del transporte y la logística: transporte de mercancías y viajeros, gestión de puertos, operativa aduanera, y derecho marítimo.

Titulaciones con las que se accede directamente

Licenciados y Diplomados en las áreas de Derecho, Económicas, Náutica, Ingeniería.

Alumnos con otras titulaciones — Créd: Máximo 20

Programa personalizado adaptado a las necesidades formativas de cada estudiante. Consistirá en contenidos de las asignaturas de planes de estudio vigentes y en un programa de trabajo y estudio personalizado bajo la supervisión de un tutor.

MÓDULO COMÚN — OBLIGATORIO — 1º CUATRIMESTRE

Materias		Créd
1466001	ASPECTOS BÁSICOS DEL NEGOCIO PORTUARIO	5
1466002	OPERACIONES MARÍTIMO PORTUARIAS	5
1466003	SEGURIDAD Y PROTECCIÓN MARÍTIMO PORTUARIAS	5
1466004	INGLÉS MARÍTIMO	5

MÓDULOS ESPECÍFICOS — ESPECIALIDAD A ELEGIR — 2º CUATRIMESTRE

OPCIONES

14661 GESTIÓN DE PUERTOS

Materias		Cr
1466101	RECURSOS HUMANOS Y FINANCIEROS. EMPRENDEDURÍA	5
1466102	TRANSPORTE MULTIMODAL	5
1466103	GESTIÓN PORTUARÍA	5
1466104	FISCALIDAD DE LAS OPERACIONES CON EL EXTERIOR	5

14662 LOGÍSTICA

Materias		Cr
1466201	RECURSOS HUMANOS Y FINANCIEROS. EMPRENDEDURÍA	5
1466202	TRANSPORTE MULTIMODAL	5
1466203	LOGÍSTICA DEL TRANSPORTE	5
1466204	INGENIERÍA DE TRANSPORTE Y LOGÍSTICA	5

14663 INGENIERÍA DE PUERTOS

Materias		Cr
1466301	EMPRENDEDURÍA	
1466302	INTERACCIÓN PUERTO-COSTA	
1466303	MODELADO FÍSICO EN PUERTOS	
1466304	PLANIFICACIÓN Y DISEÑO DE INFRAESTRUCTURAS PORTUARIAS	5
1466305	PROYECTOS Y CONSTRUCCIÓN DE INFRAESTRUCTURAS PORTUARIAS	5

MÓDULO DE APLICACIÓN — A ELEGIR — 3º CUATRIMESTRE

OPCIONES

Materias		Créd
1466901	PRACTICAS EN EMPRESAS O INSTITUCIONES	5

Materias		Créd
1466902	METODOLOGÍA DE INVESTIGACIÓN	5

Materias		Créd
1466903	TRABAJO FIN DE MÁSTER PERFIL PROFESIONAL	15

Total: 60 créditos

Cada crédito equivale a 25 horas de trabajo del alumno

TÍTULO DE MÁSTER EN GESTIÓN PORTUARIA Y LOGÍSTICA

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UCA Universidad de Cádiz

Escuela de Doctorado
Master Gestión Portuaria y Logística.

Estructura general del plan de estudios.

DISTRIBUCIÓN DEL PLAN DE ESTUDIOS EN CRÉDITOS ECTS POR MATERIA	
Créditos totales:	60
Número de créditos en Prácticas Externas:	0
Número de créditos Optativos:	25
Número de créditos Obligatorios:	20
Número de créditos Trabajo Fin de Máster:	15
Número de créditos de Complementos Formativos:	0

LISTADO DE ESPECIALIDADES (SI ES NECESARIO)	
Especialidad	Créditos Optativos
Gestión de Puertos	25
Logística	25
Ingeniería de Puertos	25

Descripción y justificación académica del plan de estudios.

1							
MÓDULO	CRÉD	MATERIA	CRÉD.	ASIGNATURA	CRÉD.	CURSO	CUATR
COMÚN	20	INTRODUCCIÓN AL SECTOR MARÍTIMO PORTUARIO. ACTORES IMPLICADOS Y OPERATIVA PORTUARIA	10	ASPECTOS BÁSICOS DEL NEGOCIO PORTUARIO	5	1	1
				OPERACIONES MARÍTIMO PORTUARIAS	5	1	1
		SEGURIDAD Y PROTECCIÓN MARÍTIMO PORTUARIA	5	SEGURIDAD Y PROTECCIÓN MARÍTIMO PORTUARIA	5	1	1
		INGLÉS	5	INGLÉS MARÍTIMO	5	1	1
ESPECIALIDAD GESTIÓN PORTUARIA	25	RECURSOS HUMANOS Y FINANCIEROS. CREACIÓN DE EMPRESAS	5	RECURSOS HUMANOS Y FINANCIEROS. EMPRENDEDURÍA	5	1	2
		TRANSPORTE MULTIMODAL	5	TRANSPORTE MULTIMODAL	5	1	2
		GESTIÓN DE PUERTOS: OPERATIVA, ECONÓMICA Y FISCAL	10	GESTIÓN PORTUARIA	5	1	2
				FISCALIDAD DE LAS OPERACIONES CON EL EXTERIOR	5	1	2
		ESTANCIAS EN INSTITUCIONES PÚBLICAS Y PRIVADAS	5	PRÁCTICAS EN EMPRESAS	5	1	3
		METODOLOGÍA DE LA INVESTIGACIÓN	5	METODOLOGÍA DE LA INVESTIGACIÓN	5	1	2

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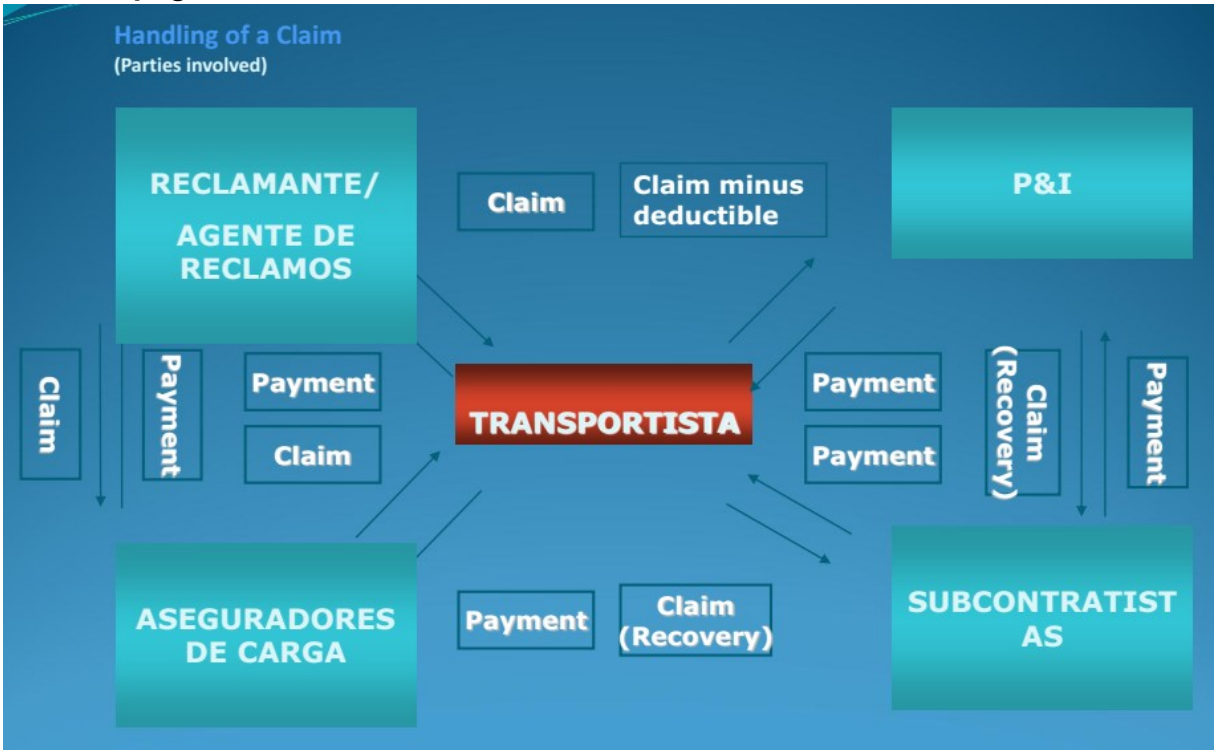

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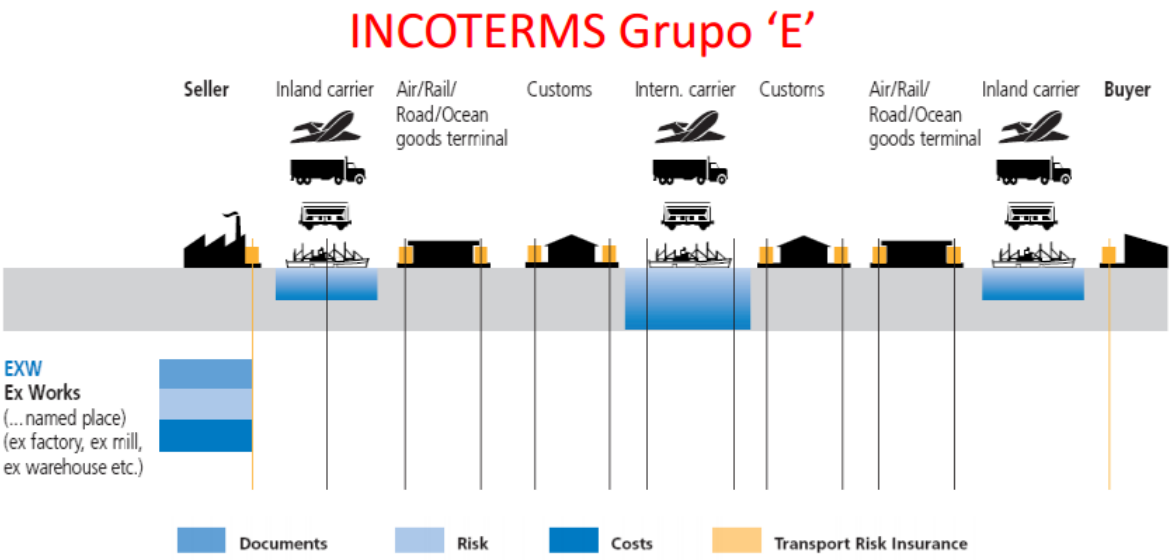
La labor de la Cámara de Comercio Internacional.
La "facilitación" del comercio



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Maritime Policy & Management: The flagship journal of international shipping and port research

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/tmpm20

Port competitiveness in container traffic from an internal point of view: the experience of the Port of Algeciras Bay

Manuel Acosta [a] , Daniel Coronado [a] & M. Mar Cerban [a]

[a] Facultad de Ciencias Económicas y Empresariales, Universidad de Cádiz, Glorieta Carlos Cano s/n, 11002 Cádiz, Spain

Available online: 22 Oct 2010

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DYNA Ingeniería e Industria
Rev. 1 del 30/9/2011

Importancia percibida de los factores que influyen en el concepto de un puerto de contenedores inteligente en el Mediterráneo

G Buiza-Camacho-Camacho, M Cerbán-Jiménez, C González-Gaya

ORGANIZACIÓN Y DIRECCIÓN DE EMPRESAS
Logística

IMPORTANCIA PERCIBIDA DE LOS FACTORES QUE INFLUYEN EN EL CONCEPTO DE UN PUERTO DE CONTENEDORES INTELIGENTE EN EL MEDITERRÁNEO

Gracia Buiza-Camacho-Camacho* Ingeniera Industrial. Especialidad en Organización.
Mª del Mar Cerbán-Jiménez** Licda. Ciencias Económicas y Empresariales. Doctora Economía y Dirección de Empresas.
Cristina González Gaya*** Doctora Ingeniera Industrial.

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** Universidad de Cádiz. Campus Bahía de Algeciras. Escuela Politécnica Superior. Avda. Ramón Puyol, s/n. 11202 Algeciras. Tfno: 620 005 954. mariadelmar.cerban@uca.es
*** Universidad Nacional de Educación a Distancia (UNED). ETS Ingenieros Industriales. C/Juan del Rosal, 12. 28040 Madrid. Tfno: 913 986 460. cgonzalez@ind.uned.es

Recibido: -- Aceptado:-

PERCEIVED RELEVANCE OF THE FACTORS INFLUENCING ON THE SMART PORT CONCEPT OF A MEDITERRANEAN CONTAINER PORT

ABSTRACT:
Conventional

Key Words: container port, multicriteria assessment, analytic hierarchy process, AHP, smart port

RESUMEN:
El presente estudio parte como punto de partida de un modelo de smart-port que pretende dar a conocer el grado en que un puerto de contenedores puede considerarse eficiente desde el punto de vista operacional, energético y ambiental.

En este contexto se considera muy adecuado optimizar el modelo smart-port mediante la ponderación de las distintas variables que lo configuran, de forma que permita orientar a los puertos de contenedores hacia la mejora Smart de su organización, siendo éste el principal objetivo de este estudio.

Para ello se utilizar el método de evaluación multicriterio (Analyticis hierarchy process-AHP).

Palabras Clave: puerto de contenedores, evaluación multicriterio, analytic hierarchy process, AHP, puerto smart

1.- INTRODUCCION

Los puertos siempre han sido centros de actividad económica, lugares de carga y descarga de mercancías que vinculan el transporte marítimo y terrestre, siendo considerados motores del desarrollo económico a nivel regional y nacional [1]. Podría decirse que el transporte de contenedores es la primera industria del mundo verdaderamente global y la que provoca en mayor medida que la economía funcione.

En el actual mundo interdependiente, los sistemas de transporte que enlazan cadenas mundiales de suministro, son el motor que alimenta el desarrollo económico y la prosperidad. Con el 80 por ciento del volumen de la mercancía del comercio mundial transportado por mar y manejada en los puertos de todo el mundo, la importancia económica estratégica del transporte marítimo como un facilitador del comercio es un hecho.

La competitividad del comercio de todos los países desarrollados depende en gran medida de un acceso efectivo a los servicios de transporte marítimo internacional y las redes de puertos. La edición 2014 del Informe sobre el Transporte

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INTERNATIONAL JOURNAL OF TRANSPORT ECONOMICS
VOL. XXXVIII · NO. 3 · OCTOBER 2011

THE ECONOMIC IMPACT OF THE PORT OF TARIFA (SPAIN) IN 2007 AND THE FORECAST FOR 2015

MANUEL ACOSTA[1] · DANIEL CORONADO[2] · Mª DEL MAR CERBÁN[3]

ABSTRACT: The Port of Tarifa is located in the Strait of Gibraltar and is the Iberian Peninsula's southernmost town. The port is operated by the Algeciras Bay Port Authority and currently handles more than a million passengers annually with fast ferries to the Moroccan Port of Tangier. The port authority has planned an expansion of the port in 2015 aimed at tripling the current number of passengers and capturing a larger volume of the roll-on roll-off (ro-ro) traffic. The purpose of this paper is to estimate both current economic impact of the Port of Tarifa in 2007 and forecast its future economic impact following the planned expansion in 2015.

KEYWORDS: Economic impact, input-output methodology, port development, Port of Tarifa (Spain).
JEL Classification: O18, R15

1. INTRODUCTION

THE Port of Tarifa, in the south of Spain, is a transit point for passengers between Europe and Africa. The activity of the port currently centres on passenger traffic but with a very limited capacity because of its relatively obsolete infrastructure. The Algeciras Bay Port Authority (*Autoridad Portuaria de la Bahia de Algeciras*) (APBA), upon which the Port of Tarifa depends, intends for it to be extended in 2015 for the purpose of tripling passenger traffic and permitting roll-on roll-off (ro-ro) traffic with Morocco. However, whether the Port of Tarifa is actually extended legally depends on a compulsory environmental impact report, which has already been drafted and sent to the Spanish Ministry of Marine Environment for evaluation. While waiting for the final decision on this report, the APBA wishes to find out how much wealth would be generated and what types of jobs created following the hypothetical extension. For this purpose, it has commissioned

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OPTIMIZATION OF OPERATIONS IN MARITIME CONTAINER TERMINALS

F. Cañero[1], M.M. Cerbán[2] and F. Piniella[3]

Received 06 February 2011; in revised form 15 February 2011; accepted 20 October 2011

ABSTRACT

The objective of this article is to present a general analysis of the various different elements that comprise the operating chain or process for working a container-carrier vessel, defining the operating ratios involved and the relationships between them; similarly, the parameters that influence the operational process are indicated. This paper includes an approach to the problem focused on a case-study: the Spanish terminals. We have carried out a quantitative analysis that allows comparative strategies to be established and applied to practical cases. The correct planning and execution of operations on a container-carrier vessel is a decisive element in the strategy of a Terminal. Numerous factors come into play and some of these, but only some, can be controlled. Experience and knowledge of the problems that can arise is fundamental when attempting to deal with these operations. We put aside, for the time being, the initiatives a terminal can take to optimize yard distribution, as well as reducing the impact of berthing problems. We consider the different measures of the various kinds of production, and the difficulties that could be encountered in trying to maximize productivity. Finally, we offer some suggestions regarding what is being done presently at the terminals to achieve their operating targets.

Key words: Container Terminal, Port management, Optimization, Spain.

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Bunkering competition and competitiveness at the ports of the Gibraltar Strait

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ARTICLE INFO

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Port competitiveness
Port choice
Port services

ABSTRACT

This article provides an exploratory analysis from the perspective of the port operators of the factors that determine the competitiveness of fuel supply at the ports of the Gibraltar Strait (Bay of Algeciras, Gibraltar and Ceuta). The methodology is based on interviews and questionnaires focused on public and private institutions involved in the port services. The results reveal that fuel prices and geographical advantage are the two main factors seen by Gibraltar Strait port operators as influencing shipping company choice of bunkering port. In order of importance, other identified factors related to the cost and quality of services, including port tariffs, supply waiting time, service rates, simplicity of crew changing, presence of restrictive environmental regulations and customs strictness.

1. Introduction

The competition that ports face within the logistics chain of transport and the key factors determining port competitiveness (for example, an adequate infrastructure, a good location and reasonable port costs) have been widely discussed in the literature (Notteboom, 2008; Tongzon, 2002, 2007; Lirn et al., 2003; Yeo and Song, 2005; Tai and Hwang, 2005). Recently, good quality of services provided has been stressed as a relevant factor (Murphy and Hall, 1995; Tongzon, 2007; Wong et al., 2008), even though, traditionally, it has not received much consideration and most efforts have been focused on creating competitive cost structures. Following this tradition, this article explores the factors affecting bunkering competitiveness at the Port of Algeciras Bay (PAB) relative to its immediate competitors (the Ports of Gibraltar – PG – and Ceuta – PC –) from the point of view of the port operators. This supply side perspective is attractive because port operators are frequently in contact with shipping lines; they know their concerns and have a good knowledge of the bunkering market.[1]

Competitiveness provides public and private institutions with information useful for development of strategies to improve their market positioning. We focus on bunkering because fuel supply is particularly relevant in this area; the fact that the Strait of Gibraltar is a passageway for international lines joining Europe, America and the Far East explains the high volume of this product. Fuel sales at the three ports of the Strait of Gibraltar reached 7.14 million tons on 2007, occupying the first position on the Mediterranean Sea and second in Europe, although still far from the 31.5 million tons from the port of Singapore or the 13.6 million tons from the port of Rotterdam.

The methodology used to identify the main factors determining competitiveness relies on interviews and questionnaires targeted on the institutions and firms involved in port activities at the ports of the Strait of Gibraltar. Therefore, this is an analysis from the perspective of the supply side. The data were completed with a study of secondary statistical sources in order to describe both the evolution of bunkering on the Strait of Gibraltar during the last years and the distribution of this market between the three ports. The paper is organized as follows: Section 2 presents a review of empirical causes; Section 3 describes the global bunkering market and the relative position and characteristics of the Strait's ports; Section 4 presents an analysis of the main determinants of competitiveness of the three ports of the Strait: Algeciras Bay, Gibraltar and Ceuta; Section 5 summarizes the main conclusions and policy implications.

2. Literature review

In this review we summarize some key empirical studies of port competitiveness. As stated in the introduction, recent studies show that there are a number of common determinants of port competitiveness, although the order changes depending on the port and type of traffic analysed. Tongzon (2002, 2007), Lirn et al. (2003, 2004), Yeo and Song (2005), Tai and Hwang (2005) and Tongzon and Heng (2005) stress the importance of port infrastructure, geographic location and port costs as the main decisive factors.

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[1] Contrasting the results from the supply side with data from the demand side would have enriched the conclusions, as the Editor and one of the referees pointed out. That was the starting point of the research; however, the data collection process was unsuccessful because only one of 69 questionnaires sent to shipping lines operating at the ports of the Strait of Gibraltar was completed.

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The Development of China's Coastal Ports in the Era of Globalization.

L. Zhen[1,2], M. M. Cerbán[1,3] and F. Piniella[1,4,*]

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Coastal Port Development, Modern Port Logistics, Operating Modes, Investment, Port Enterprises.

ABSTRACT

By the 21st century China's port logistics have been aligned fully with the country's global trade needs, in which the development of Chinese coastal ports is playing a very important role. In this article, we describe briefly the development process and current situation of China's coastal ports from a macro perspective. From the study and analysis of this process, a general picture can be gained of the evolution of China's port logistics, and suggestions can be made for their future development. The rate of increase seen recently in China's international trade volumes will slow; exports and imports will tend to balance; and the structure of trade will tend to stabilize, with the proportion of normal goods traded increasing. The proportion of intermediate products and materials for further processing traded will decrease; and the structure of foreign trade in commodities will gradually be regularized.

1. Introduction

Since the basic reform of China's[1] economy and its opening up as an emerging market-oriented country, China has gradually become more integrated with the g lobal economy. Numbers of ports and port production have undergone wide and substantial growth. Ranked by cargo throughput volumes, China now has 8 of the world's leading ports. In respect of container traffic, China accounts for 7 of the world's top 20 container ports. The cargo throughput of China's ports has been in the world top rank for 8 years continuously. This scale of port development is unique in the world.

With globalization companies organize their production and source their raw materials more and more internationally, and so a global trade and transport chain has gradually been formed. In every part of the world, coastal ports especially have become integral parts of the international logistic network. Port logistics plays an important role in most national economies and in international trade, which has become a primary indicator of the level of development reached by a national economy.

Considered by many as the manufacturing centre of the world, China supports a large proportion of total world construction of coastal ports. The logistics of some Chinese ports have reached the advanced level typical of the best international ports but on the whole, the level of port logistics is low because of China's late beginning. Moreover, there are still many problems associated with the infrastructure, technology and organization, which are restricting the development of ports. In view of this, it is of great importance to study the development of Port Logistics and to identify and resolve the problems existing in the context of continuing globalization.

1.1 Methodological aspects

The main research methods adopted for this study are as follows: a historical review has been carried out of the development of China's coastal ports and how they have changed; the case study method, considering a few influential cases, provides secondary evidence and descriptions, for the analysis of the strategy and summary of the process of evolution; lastly,

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[1] In this article refers to mainland China, excluding Hong Kong, Taiwan and Macao.

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Simulating the landside congestion in a container terminal. The experience of the port of Naples (Italy)

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Abstract

The Consorzio Napoletano Terminal Containers (CO.NA.TE.CO.), located in the Port of Naples, is continuously exposed to a problem of traffic congestion. A queuing model has been developed to analyze this congestion problem.
The model includes part of the process of exportation. The entities represented the vehicles that access into the terminal, and the servers were the entrance gate and the process of moving the freight to the yard. According to these definitions, five models have been developed with the aim of simulating solutions to the congestion problem. The first model reproduces the current situation, and the modifications in the servers have been evaluated through the rest.
Finally, it has been proved that all processes inside the terminal were strongly dependent. The study shows that the solution should consider the decreasing simultaneously the time of service in the access gate and in the yard.

Peer-review under responsibility of CIT 2014.
Key words: Discrete-event simulation; queues; congestion; port investment; container

1. Introduction

The maritime transport has experienced a continuous growth for the last years, since it provides low price transportation and it is a less polluting process, in addition to other advantages such as reducing road traffic. For this

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Clasificación de los Puertos Españoles mediante Indicadores de Explotación utilizando Análisis de Conglomerados

Classification of Spanish Ports by studying Operational Indicators using Cluster Analysis

DOI: http://dx.doi.org/10.17981/ingecuc.12.2.2016.04

Articulo de Investigación Científica - Fecha de Recepción: 10 de Noviembre de 2015, Fecha de Aceptación: 7 de Abril de 2016

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***Resumen*–** En este artículo se clasifican los puertos españoles utilizado una serie de indicadores que caracterizan la actividad portuaria. Estos indicadores se tratan con herramientas de análisis estadístico. Se ha elegido el análisis de conglomerados para realizar agrupamientos entre los puertos seleccionados. Para ello se ha seguido una metodología de trabajo que cubre todas las fases de la investigación: entorno, caracterización, fuente de datos, análisis de conglomerados, resultados y análisis de resultados. Los resultados obtenidos demuestran que los puertos españoles se pueden caracterizar correctamente por medio de indicadores físicos y de explotación, y que el análisis de conglomerados es una herramienta válida y útil para el entorno portuario.

***Palabras clave*–** Puerto, clasificación, indicadores, análisis de conglomerados, explotación portuaria.

***Abstract*–** This article classifies Spanish ports using a number of indicators that characterize the port activity. These indicators are treated with statistical analysis tools. Cluster analysis has been chosen to perform groupings among the selected ports. A methodology that covers all phases of research: environment, characterization, data source, cluster analysis, results and analysis of results have been followed in this paper. The results show that the Spanish ports are correctly characterized by physical and exploitation indicators, and that cluster analysis is a valid and useful tool for the port environment.

***Keywords*–** Ports, classification, indicators, cluster analysis, port operations.

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ASSESSMENT OF THE FACTORS INFLUENCING ON A SMART PORT WITH AN ANALYTIC HIERARCHY PROCESS

G Bulza-Camacho-Camacho, M Cerbán-Jiménez, C González-Gaya

ORGANISATION AND BUSINESS MANAGEMENT
Logistics

ASSESSMENT OF THE FACTORS INFLUENCING ON A SMART PORT WITH AN ANALYTIC HIERARCHY PROCESS

Gracia Bulza-Camacho-Camacho*, Mª del Mar Cerbán-Jiménez**, Cristina González-Gaya***

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1.- INTRODUCTION

The ports have always been strategic centres of economic activity that link the maritime and land transport, being considered engines of the economic development. It could be said that the containers transport is the first industry truly global in the world [1]. Currently in Europe, such transport head for a model which in 2020 will be smarter, sustainable and integrated. Due to this fact, is a priority to have information in order to know in what situation are the Mediterranean container ports and planning actions for its development [2].

In this line, there are many initiatives on literature, among those highlighted [3] for its holistic and integrated approach. The authors analyse the "smart-port" (SP) concept from three perspectives: operational, energy and environmental. About a bibliographic analysis and consulting experts, it assesses 23 factors that define the SP level of a Mediterranean container port (Table 1):

Areas	Factors
Operational	Quay length
	Storage area (patio area)
	Capacity to receive large vessels
	Size and maximum capacity use
	Technological level
	Automation level
	Intermodality level
	Lines which stopover in the port
	Quality management, security and health systems
Energy	Total energy consumption (primary energy)
	Energy consumption on the part of the containers
	Energy consumption of the internal fleet of vehicles
	Energy consumption on the part of the offices
	Energy consumption on the part of the light system
	Energy consumption on the part of the team dedicated to the container's movement (cranes, etc.)
	Use of renewable energy
	Energy management system
Environment	Environmental management systems
	Waste management
	Water management
	Emissions to air
	Noise pollution
	Leaks and spillages of substances into the sea

Table 1: Areas and factors of the SP model. Source: Authors [3].

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	PORT MANAGEMENT AND MULTIMODAL LOGISTICS
Thematic(s)	**Thematic 1: Maritime and port Management** **Thematic 2 : Multimodal Logistics**
Type of module *(Select one or more boxes)*	☒ Lecture course ☐ Tutorial exercice ☐ Practical exercice ☐ Group workshop ☐ Field trip ☐ Other – precise:

Teaching manager	Dr JIHAD JAMÏ
Speakers *(Precise if external speakers)*	Dr. Rachid El HOUDAIGUI Dr. Sarra SEFRIOUI

Year / Semester	2
Number of hours	60 hours Thematic 1: Maritime and port Management (30 h) Thematic 2 : Multimodal Logistics (30)
Number of groups	01

Objectives	- To offer a deeper understanding of modern port economics and port management, as well as strategies for managing supply chains. - To provide with methods, concepts and theories to understand and analyse the complexities of global maritime supply chains. - To respond to increasingly complex global supply chains, by choosing the most effective and efficient strategies. - To know different organizations involved in the global logistics and port Management - To give an understanding of the processes that underlie port management and maritime logistics from an economics, operations and management perspective - To explain international and maritime transport, terminal and port management, intermodality and hinterland transport, and the interrelationship between port and region from a multidisciplinary perspective

Content	**Thematic 1 : Maritime and port Management** - The first part of the module aim to offer the students' knowledge and insight in the economic structure of the maritime industry. - Expand the knowledge in the set of legal norms that correspond to the Maritime Navigation - The determination of prices, - The origins of revenue and costs, - The consequences of cost structures for specialization in activities in shipping. - Highlight the role of containerization in the maritime transport. - To know the characteristics of the maritime market and the behavior of the shipping companies. - To be able to formulate the requirements of shipping companies from the perspective of port management. - Acquire training regarding the legal status of contracts for the operation of the vessel with special reference to chartering and the bill of lading regime, in order to advise on contracts for transport of goods and in cases of damage. **Port Economics and Management** - to provide student with theoretical and applied knowledge on seaports from an economic and management perspective. - to focus on ports as element in international supply chains and the locations of in general three economic activities, namely cargo transfer, (petro-) chemical industry, and logistics. - to know the important determinants for a port (location in transport networks and the hinterland they serve). - to analyze different concepts (port competition, port competiveness and the performance of ports). - to know the role of the port authority and its activities. - to provide theoretical and applied knowledge about the relationship between ports and regional economic development. - to know the operation of the transit of the merchandise by the port and of the ship in its entrance to the port, as well as the different operator involved in the process

Content	**Thematic 2 : Multimodal Logistics** - The concept of Logistics and SCM - Composition of the SCM - Organization of the SCM - Multimodal Freight Transport and Port Management - Cases in Maritime and Transport Law - Multimodal approach to transport (Transport management) ; - The economic fundamentals of the multimodal transport (sea, land, rail, air, Container…) ;

	- The container as a multimodal way of transport (characteristics, statistics, regulation, the organization of the container terminals..) ; - Understand the operation of the multimodal transport chain and the responsibilities in case of damages to the merchandise, with special relevance to containerized cargo. - The modern realities of the circulation of world trade (maritime routes, corridors, hubs, interfaces, clusters) ; - Organizational aspects of the multimodal transport ; - Logistical obligations (international conventions-Law, technical constraints, logistical specifications ...) - Multimodal transport operators (road, air, sea, rail and river) - The context of logistics and transport in Europe and Morocco - Comparison of European and Moroccan transport policies - Customs and logistic regulations - Incoterms - Calculating costs

Teaching methods	Lectures, workshops and written exam.
Knowledge required	Maritime and port environment
Skills required	

Equipment required	A selection of articles and literature will be indicated on Blackboard/Canvas before the course.
Type of evaluation *(Select one or more boxes)*	☒ Oral – precise: ☒ Written – precise: ☐ Other – precise:

Comments on evaluations *(Precisions on criteria)*	**Examination** Method of examination : Module will be evaluated with a written exam. Other evaluations will be held during the course (Student presentations, cases, exercises, participation, …) **Precision on criteria** 60 % of the evaluation concerns the end-of-semester exam 40% concerns the other evaluations: (written tests, oral tests, homework, lectures, participation, presentations)

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[14/11/2018]** till **[27/11/2018]**
Duration (days) – excluding travel days: 12

The Staff Member

Last name (s)	Bazairi & Benhoussa	First name (s)	Hocein & Abdelaziz
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Contact person

First/Last name(s)	Abdellah Ammar
Position	Professor

The receiving university

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Faculty/Department	Faculty of Marine and Environmental Sciences
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Country	Spain

Contact person

First/Last name(s)	Ignacio Hernández
Position	Professor

Type of mobility

☐ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

During our stay in Cadiz, we had the opportunity to: (1) meet the coordinators of the masters 'Oceanography', 'Conservation', 'Coastal Management' and 'Aquaculture', (2) visit the various laboratories of the Faculty of Marine and Environmental Sciences, (3) attend scientific events: 'Coastal Management Seminar' and 'Aquaculture Day' and (4) Field visit 'La Caleta and Labimar'. The aim of this visit was to see closely the organizational and operational modalities of the masters taught at the Faculty, the modules taught and the possibilities for cooperation (teaching, co-supervision of students, exchange of students, teaching in distance, etc.) as part of the future Master's course being accredited in Morocco. We focused on topics in relation with our module project related to the marine ecology and the coastal management.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	14.11.2018	Travel from Casablanca to Malaga (by plane) and from Malaga to Puerto Real (Bus)
2	15.11.2018	➢ Meeting with Prof Ignacio Hernández, the hosting Professor at the University of Cadiz; planning of the activities; ➢ Meeting with Prof. Fidel Echevarría, Coordinator of SCOLA-MAR project at the University of Cádiz; ➢ Visit of the laboratories of the Faculty of Marine and Environmental Sciences; ➢ Visit, with Prof. Fidel Echevarría, to the Military Scientific Vessel in the Port of Cadiz: ○ Visit of the facilities of the Vessel; ○ Assist to two conferences about (1) an expedition to the Antartica and (2) different oceanographic campaigns performed by the University of Cadiz.
3	16.11.2018	National holiday
4	17.11.2018	Week-end
5	18.11.2018	
6	19.11.2018	➢ Visit to the bibliotheca of the Faculty of marine and environmental sciences ➢ Meeting with Prof. Rafael Mananes, Coordinator of the Master 'Oceanography' ➢ Meeting with Prof Alejandro Perez from the Department of Biology;
7	20.11.2018	➢ Meeting with Prof. Pr. Gonzalo Munoz, Coordinator of the Master 'Conservation and Management of Natural ecosystems'; ➢ Visit to the Laboratory of Aquaculture with a delegation from Sweden;

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8	21.11.2018	➢ Meeting with Prof. Ana Macias, Coordinator of the Master 'Integrates coastal zone Management' ➢ Meeting with Pilar Drake and Jose A. Cuerta (Center of Marine Science of Cadiz) in relation to ongoing cooperation on Pea Crabe; ➢ Visit, with Prof. Ignacio Fernandez and Alejandro Perez, to the Salinas of the Cadiz bay.
9	22.11.2018	➢ Participation to the Ibericoamerian Syposium on integrated management of coastal and marine spaces ➢ Meeting with Prof. Macarena Castro and Alejandro Perez Hurtado as membersof the group of the Coastal wetlands conservation; ➢ Meeting with Prof. Alejandro Merlo, coordinator of the Master 'Aquaculture' ➢ Meeting with Prof. Alfonso Corzo Rodriguez working on the interface water-sediment.
10	23.11.2018	➢ Participation to the 'Aquaculture Day 2018', organized at the Faculty of Sciences, Puerto Real Cadiz.
11	24.11.2018	Week-end
12	25.11.2018	
13	26.11.2018	Field trip to the Caleta with Prof. Ignacio Hernández and his research team and visit to the 'Labimar' Laboratory located in the Castillo de San Sebastian.
14	27.11.2018	Travel from Cadiz to Sevilla, and from Malaga to Casablanca

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

The discussion with the coordinators of the Master in the University of Cadiz was an opportunity to calibrate our module on what is done in the University of Cadiz and to evaluate the opportunities of mobility of students and professors between Cadiz and Rabat and also possibilities of co-direction of student research.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Report was sent to the coordinator of the Scolamar project at The Mohammed University Mohammed V in Rabat and to the hosting professor the the University of Cadiz.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

Université Mohammed V de Rabat
Faculté des Sciences de Rabat

ScolaMAR
Erasmus+ Capacity building

RAPPORT DE LA MISSION A L'UNIVERSITE DE CADIZ (Novembre 2018)

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Dans le cadre du Projet ScolaMar, nous avons été invités (Hocein Bazairi et Abdelaziz Benhoussa) à participer un "Job-shawdowing" à l'Université de Cadiz (Espagne) entre les 14 et 27 Novembre 2018.

La Faculté des Sciences de la mer et de l'environnement de Puerto Real est localisée au cœur du Parc Naturel de la Baie de Cadix. Cet établissement fait partie du grand Campus de l'Université de Cadiz qui réunit la plus grande concentration de centres scientifiques et technologiques. En effet le Campus de Puerto Real compte, en plus la Faculté de Sciences de la Mer et Environnement, cinq centres universitaires : l'École de Génie Naval et Océanique, l'École de Génie Maritime, Nautique et Radio-électronique, l'École Supérieure d'Ingénierie, la Faculté de Sciences, et la Faculté de Sciences de l'Éducation.

Nous avons été bien accueillis par M. le Professeur Ignacio Hernández, qui nous a préparé un planning étoffé d'activités très intéressantes.

Dans un premier temps le professeur Ignacio Hernández, nous a fait visité tous les infrastructures et les laboratoires de l'établissement. Cette visite nous permis de faire la connaissance de plusieurs chercheurs dans des domaines divers.

1. ENTRETIENS AVEC LES RESPONSABLE DE MASTER

Des séances de travail ont été organisées avec les coordinateurs des différents masters de la Faculté des Sciences de la mer et de l'environnement de l'Université de Cadiz, notamment :

Master 'Océanographie' : Coordinateur Pr. **Rafael Mananes**

Ce master interuniversitaire (3 Universités d'Espagne) a pour objectif d'analyser, de manière interdisciplinaire, les processus qui ont lieu dans les océans, y compris les mers peu profondes, et les marges continentales. Ce parcours permet la formation de spécialistes dans l'analyse des processus liés aux océans et des professionnels dans les activités économiques liées à la mer.

Master 'Conservation et gestion des milieux naturels' : Coordinateur Pr. **Gonzalo Munoz**

Ce Master vise la formation avancée d'experts dans le domaine de la gestion de

l'environnement naturel (terrestre et marin), notamment la gestion et conservation de la Biodiversité. Ce master fait intervenir plusieurs acteurs socio-économiques, et les étudiants effectuent beaucoup de stages à l'extérieur de l'université.

Master Gestion intégrée des zones côtières : Coordinatrice Pr. **Ana Macias**

Ce Master propose aux étudiants une formation spécifique visant à gérer de manière intégrée les espaces côtiers en suivant une approche multidisciplinaire qui fournit des techniques permettant d'inclure toutes les composantes et les groupes concernés. Cette démarche est essentielle pour traiter efficacement et durablement des problèmes très complexes.

Master Aquaculture : Coordinateur Pr. **Alejandro Merlo**

Ce Master offre une formation de haut niveau dans les domaines fondamentaux de la biologie des espèces marines aussi bien sur le plan théorique et appliquée. (pêche, culture, production contrôlée, gestion de l'environnement, aquaculture), il permet acquisition des nouvelles technologies utilisées dans l'aquaculture et de la pêche.

La formation dans le cycle de Master en Espagne dure seulement une année. L'organisation de l'enseignement est trimestrielle (4 modules/trimestre). Chaque module se déroule sur 2 semaine d'affilées au bout desquelles une évaluation est organisée. Le dernier trimestre est réservé au projet de fin d'étude (PFE). Plus de 50% de l'enveloppe horaire d'un module est dédiée aux travaux pratiques, travaux de terrain ou stages.

Chaque Master dispose d'un budget spécifique qui lui permet un bon déroulement de l'enseignement (particulièrement les TP) et la réalisation des PFE.

Notons cependant que les Modules sont payant (16 euros / module), si le module n'est pas validé et que l'étudiant veut le repasser une deuxième fois, il doit payer le double (32 euros) ou le triple s'il le ratte une deuxième fois.

2. REUNIONS DE TRAVAIL

Nous avons également participé à plusieurs réunions de travail avec les différentes équipes de recherches de la Faculté des Sciences de la mer notamment avec :

- le responsable du laboratoire Ecologie, océanographie biologique ;
- Alejandro Perez Hurtado et Macarena Castro du Groupe de la Conservation des

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zones humides côtières ;

- Alfonso Corzo Rodriguez, Microbiologie de l'interface Eau-sédiment

3. SEMINAIRES

Notre séjour a coïncidé avec l'organisation de deux séminaires auxquels nous avons assisté

- Séminaire ibéro-américain sur la gestion intégrée des espaces côtiers et marins (Ibemar, Red Iberoamericana), (22 novembre 2018, faculté des sciences de la mer et de l'environnement , Puerto Real, Cadiz) ;

- Journée de l'aquaculture 2018, Investir pour grandir (23 Novembre 2018 à la Faculté des Sciences Puerto Real, Cadiz).

4. VISITE DES LABORATOIRES

Visite du d'un bateau scientifique avec le professeur Fidel Etchivaria.

Il s'agit d'un bateau militaire, transformé en bateau de recherche, équipé de plusieurs laboratoires (laboratoire de conditionnement, laboratoire d'analyses, laboratoire de génétique, bassins de plongés, salle de conférence ...). A la fin de cette visite nous avons assisté à deux exposés, l'un sur une mission d'échantillonnage au pôle Nord et la deuxième sur une expédition d'échantillonnage trans-atlantique (du brésil à l'Espagne)

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Visite du laboratoire d'aquaculture

La responsable en pleine explication du fonctionnement de cette plateforme d'élevage

Bassins d'élevage équipés d'une station de controle à distance des différents paramètres

Salle d'élevage de microalgues

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Visite des salines

Les professeurs Alejandro Perez Hurtado et Ignacio Hernández nous ont fait visiter les salines de la baie de Cadiz. Il s'agit d'anciennes salines abandonnées, dont l'université de Cadiz a réussi à obtenir le droit de les exploiter pour une durée d'une trentaine d'année. Des travaux de réhabilitation et d'aménagement ont été réalisés notamment par l'équipe du professeur Alejandro et son équipe (aménagement d'habitats de nidification pour le Gravelot à collier interrompu, l'Echasse blanche, l'Avocette élégante ...). Ces actions ont permis une augmentation considérable de la population nicheuse du gravelot à collier interrompu dont l'effectif a passé de quelques couples à plus d'une centaine de nids.

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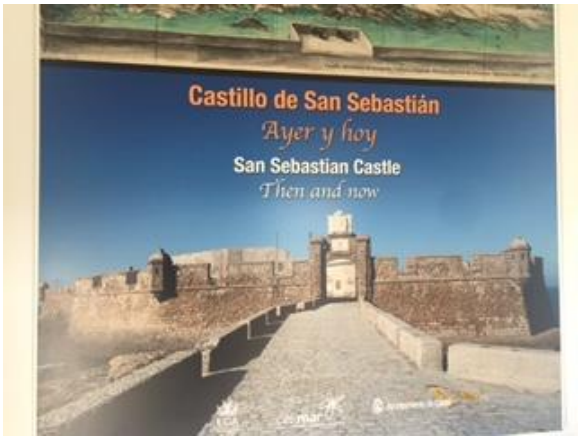
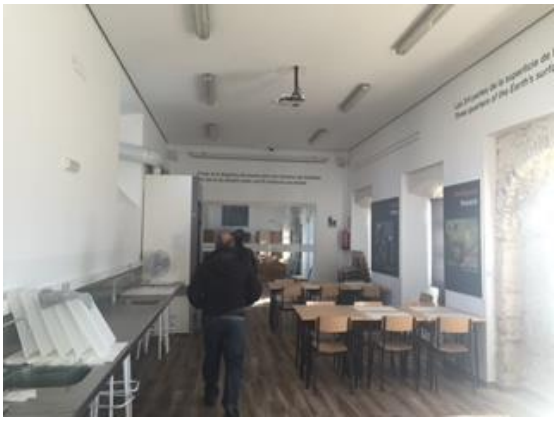
Visite de terrain de la Caleta et le laboratoire "Labimar"

Une visite d'échantillonnage des algues a été organisée à la Caleta par le professeur Ignacio Hernández et ses collaborateurs. Nous avons également visité le laboratoire "labimar" situé à l'intérieur du château du Saint Sébastien.





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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	Marine and coastal environments : biodiversity, monitoring and management
Thematic(s)	Marine biology and ecology, ecological quality status, coastal zone management, protected areas
Type of module *(Select one or more boxes)*	☒ Lecture course ☐ Tutorial exercice ☐ Practical exercice ☐ Group workshop ☒ Field trip ☒ Other – precise: Homework,

Teaching manager	Prof Hocein Bazairi
Speakers *(Precise if external speakers)*	Prof Hocein Bazairi Prof Abdelaziz Benhoussa

Year / Semester	3
Number of hours	48
Number of groups	1

Objectives	The objectives of this module are: ❖ to provide in-depth training on coastal and marine environments through, on the one hand, an understanding of these ecosystems and internal and external environmental factors, and on the other hand, an analysis of the issues related to these natural environments. The coastal environments treated will be beaches, lagoons, estuaries and continental platforms. ❖ to provide training on methodological approaches for the evaluation and monitoring of the environmental quality of coastal environments, the purpose of which is to provide rules and methods for setting up and carrying out a comprehensive study of a coastal area. Above all, it is a matter of rigorous methodological reflection on the way of observing the coastal zones. ❖ to introduce students to the concept of integrated management of coastal and marine ecosystems.

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Content	**Lectures:** **1. Presentation of coastal environments and their operating parameters:** this part of the course will be organized around a presentation of the marine and coastal environments (estuaries, lagoons, deltas, etc.) and the different operating parameters of these ecosystems (internal parameters and external). An introduction to the impact and response of these ecosystems to anthropogenic actions and climate change will be addressed. **2. Presentation of the biotic environment of marine and coastal ecosystems:** this is a reminder of the various forms of life in coastal and marine ecosystems. Special attention will be given to benthic organisms, which by their characteristics are the most used biological component in the assessment of the ecological quality of coastal and marine ecosystems. **3. Methods of study, assessment of environmental quality and monitoring of marine and coastal ecosystems:** This part will enable students to adapt to the specificity of marine and coastal environments. This part of the course is an introduction of the students to different techniques of characterization of these ecosystems, evaluation of the state of their ecological and environmental quality using multi-proxy approaches (biotic indices, geochemical indices, coefficients of contamination, etc.), and monitoring. These methods and approaches will be based essentially on the analysis of the benthic macrofauna and the sediment of these ecosystems. **4. Integrated Management of Marine and Coastal Ecosystems:** In addition to the presentation of the concept of integrated management, the course will develop various methods and approaches to the analysis of issues related to coastal management and risk, the conservation of biodiversity and threats to coastal environments at the local, national and international levels. **Practical field work:** Two practical activities will be scheduled. These are field placements where students will have the opportunity to become more familiar with the various concepts and methodology provided in this module. These practical activities, followed by practical work sessions, will result in the development of the students' internship reports which are noted and considered in the evaluation of the module. **1. Ecological and environmental quality of a coastal environment:** in the field, students will be introduced to various techniques for studying a coastal ecosystem (sampling of benthic macrofauna and sediment) in order to characterize its quality ecological and environmental using indices based on the benthic macrofauna and the geochemical quality of the sediment. A practical session will allow students to process and analyze this data. **2. Integrated management of a coastal environment:** the aim is to enable students to characterize a coastal environment through the analysis of documents (topographic maps, aerial photos, satellite images), and a field intervention for to better define the nature of the coastal environment and to put it in its natural context, to identify the determining factors of its functioning as well as the various disturbances and threats. Through an application of the ICZM approach, the student will be introduced to the concept of integrated management of a coastal ecosystem through the use of specialized techniques such as the IRCS approach and the use of state and monitoring indicators. .
Teaching methods	The teaching is both reflexive and technical, using field approaches, quantitative and spatial data processing and information analysis. The module is based on lectures and practical field work and analysis of data.
Knowledge required	This module is for students who have completed a bachelor's degree in biology or in environmental sciences with bachelor's degree in biology and ecology..

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Skills required	Biology, Environement and Ecology
Equipment required	Bus for the field works ; sampling equipment (corer, crab, etc.) ; sediment granulometer, oven and furnace for the biomass determination,
Type of evaluation *(Select one or more boxes)*	☒ Oral – precise: homework presentations ☒ Written – precise: ☒ Other – precise: Fieldwork and practical analysis reports
Comments on evaluations *(Precisions on criteria)*	The evaluation is aiming at testing (1) the capacity of the students to present and defend a subject in relation with the topics of the module (oral presentation of homework), (2) the understanding of the theoretical aspects of the module and the capacity of redaction (written evaluation) and (3) the capacity of reporting in relation with the field works and practical analysis.

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UNIVERSITA CA'FOSCARI VENICE

From	To	University	Staff name
01/10/2017	15/10/2017	Chouaib Doukkali El Jadida	EL KHALIDI Khalid
		Ibn Tofail Kenitra	BENAMMI Mohamed
		Ibn Tofail Kenitra	BENMOHAMMADI Aïcha
		Ibn Tofail Kenitra	ZIDANE Lahcen
25/03/2018	08/04/2018	Abdelmalek Essaâdi Tangier	BOULAASSAL Hakim
19/04/2018	03/05/2018	Abdelmalek Essaâdi Tangier	DAMNATI Brahim
10/04/2018	24/04/2018	Abdelmalek Essaâdi Tangier	KHADDOR Mohamed
05/12/2018	19/12/2018	Mohammed V Rabat	SALMANI El Mehdi

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **01/10/2017** till **15/10/2017.**
Duration (days) – excluding travel days: **13**

The Staff Member

Last name (s)	EL KHALIDI	First name (s)	KHALID
Nationality	MAROCAINE	Academic Year	2017 - 2018
Position	Enseignant Chercheur /PA		
E-mail address	elkhalidi_khalid@yahoo.fr		

The sending university

Name	Université Chouaib Doukkali
Faculty/Department	Faculté des Sciences/ Département de Géologie
Address	BP 20, 24000 El Jadida, MAROC
Country	Maroc

Contact person

First/Last name(s)	BENDAHHOU ZOURARAH
Position	Enseignant Chercheur/PES

The receiving university

Name	Université Ca' Foscari (Venice, Italy)
Faculty/Department	Département des sciences de l'environnement, de l'informatique et des statistiques
Address	Dorsoduro 3246, 30123 Venezia
Country	Italy

Contact person

First/Last name(s)	Roberto Pastres
Position	Enseignant Chercheur

Type of mobility

☐ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Dans le cadre du programme Scolamar, volet formation des formateurs, j'ai pu participer à un stage d'observation sur les méthodes pédagogiques pratiquées pour les étudiants du master « sciences de l'environnement » à l'université Ca'Foscari.
L'objectif principal de ma mission était de participer à l'apprentissage et la diffusion du savoir en matière des sciences exactes et plus précisément de pouvoir acquérir les techniques et les méthodes pédagogiques pratiquées par nos collègues du département des sciences de l'environnement, de l'informatique et des statistiques à l'université Ca'Foscari.
Cette formation de formateurs va me permettre d'élargir mes compétences pédagogiques afin de mieux participer au Master pluridisciplinaire visant la formation d'un potentiel humain de haut niveau capable de relever les défis et réussir les challenges en matière des Sciences exactes, Sciences Juridiques, Economiques et Sociales de la mer (Life Science and Sustainable Blue Growth).
Ce Master sera monté conjointement par plusieurs universités marocaines dont la nôtre : Université Chouaib Doukkali, Facultés des Sciences, Département de Géologie, El Jadida.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	Dimanche 01/10/2017	Départ vers Venise, Italy
2	Lundi 02/10/2017	Réception au campus universitaire Ca Foscari de Mestre par le professeur Roberto PASTRES. (Visite du campus universitaire de Mestre). Présentation du master « sciences de l'environnement » de l'université Ca Foscari et le choix des cours adéquats avec le module à enseigner au master Scolamar.
3	Mardi 03/10/2017	Réception au secrétariat par Mme Patrizia Resente (acquisition d'une carte d'accès à la bibliothèque). Réception au campus universitaire de Mestre par le professeur RUBINO Angelo et discussion sur - le programme Scolamar et ces objectifs - le programme des cours de climatologie et d'océanographie - les possibilités de mettre en place une future collaboration scientifique.
4	Mercredi 04/10/2017	Participation au : - Cours de climatologie (10h 30 à 12h) Pr. RUBINO - Cours d'océanographie (12h 15 à 13h 30) Pr. RUBINO
5	Jeudi 05/10/2017	Participation au cours sur les changements climatiques 10h 30 à 12h (Pr. PASTRES) Recherche bibliographique à la bibliothèque (campus universitaire Mestre)
6	Vendredi 06/10/2017	Recherche bibliographique à la bibliothèque (campus universitaire Mestre)
7	Samedi 07/10/2017	Visite de la lagune de Venise

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8	Dimanche 08/10/2017	Journée libre
9	Lundi 09/10/2017	Recherche bibliographique à la bibliothèque du Musée d'histoire naturelle (Venise)
10	Mardi 10/10/2017	Recherche bibliographique à la bibliothèque (campus universitaire Mestre)
11	Mercredi 11/10/2017	Participation au : - Cours de climatologie (10h 30 à 12h) Pr. RUBINO - Cours d'océanographie (12h 15 à 13h 30) Pr. RUBINO
12	Jeudi 12/10/2017	Participation au cours sur les changements climatiques 10h 30 à 12h (Pr. PASTRES) Recherche bibliographique à la bibliothèque (campus universitaire Mestre)
13	Vendredi 13/10/2017	Recherche bibliographique à la bibliothèque (campus universitaire Mestre) Briefing de notre séjour scientifique avec les collègues marocains participants Signature au secrétariat de mon attestation de présence
14	Samedi 14/10/2017	Journée libre
15	Dimanche 15/10/2017	Retour vers le Maroc

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

Dans le cadre du projet ScolaMAR-Innovative training for Smart coastal management and Sustainable blue growt, ERASMUS PLUS Programme, nous avons participé aux activités pédagogiques avec deux collègues italiens : les professeurs Roberto PASTRES et RUBINO Angelo.
Cet échange pédagogique m'a permis de découvrir quelques méthodes employées dans l'enseignement des étudiants du master « sciences de l'environnement ». Dans un premier lieu la préparation d'une présentation claire et bien illustrée (Images, vidéos…), ensuite un enchaînement du cours qui permet aux étudiants de bien suivre le déroulement du cours et aussi la mise en place des cas concrets et des exercices qui nécessitent une recherche bibliographique (à la bibliothèque ou sur le net) et dans l'objectif est de permettre à l'étudiant d'être non seulement un récepteur d'information, mais aussi un participant à la production.
Ces méthodes pédagogiques vont me permettre d'enrichir mon expérience en matière d'enseignement et elles vont m'aider à réussir le bon déroulement du module que je vais assurer au future master.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Ma mission à l'université Ca'Foscari a été une occasion pour discuter avec des collègues marocains et italiens sur la mise en place du future master au maroc et les possibilités d'échanges des étudiants.
Le présent rapport sera envoyé au coordonnateur du projet Scolamar au niveau de notre université.

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ANNEXES

Programme of climatology course

Course objectives

The lecture is an introduction to climatology. Particular attention will be devoted at elucidating issues related to climate change.

Pre-requirements

Basic mathematics and physics

Contents

I Introduction;

II: Our Planet in the solar system;

III: Composition and physical characteristics atmosphere and ocean;

IV: Atmospheric and oceanic convection;

V: Radiation, temperature, salinity, stability;

VI: Humidity and clouds;

VII: Laws of motion;

VIII: Local circulation systems in atmosphere and ocean;

XI: General atmospheric and oceanic circulation;

X: Ocean-atmosphere interactions;

XI: Climate system;

XII: Climate stability and climate change.

Referral texts : Lecture notes and slides

Type of exam : oral

Assessment methods

Goal of the oral exam is to ascertain the comprehension of the different topic of the class, particularly as far as the elaboration of the acquired information is concerned.

Teaching methods

Frontal Lectures, possibly experimental activity.

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Programme of oceanography course

Course objectives

The lecture represents an introduction in physical oceanography. Special attention will be paid to operational aspects, possibly during excursions also in the Lagoon of Venice.

Pre-requirements

Basic physics and mathematics.

Contents

1)Introduction;

2) The Oceans;

3) Characteristics of sea water

4) Optics and acoustics;

5) Hydrodynamics;

6) Tides, surface and internal waves;

7) Large-scale oceanography;

8) coastal phenomena;

9) Mesoscale oceanography: fronts, vortices, filaments;

10) The Mediterranean Sea

EXS) Operative aspects.

Referral texts

Pond, S. and G.L. Pickard, 1983: Introductory Dynamic Oceanography. Pergamon Press, 2nd. edition, 330 pp.

Pickard, G.L. and W.J. Emery, 1990: Descriptive Physical Oceanography – An Introduction. Pergamon Press, 5th edition, 320 pp.

Slides.

Type of exam : oral

Assessment methods

Goal of the oral exam is to ascertain the comprehension of the different topic of the class, particularly as far as the elaboration of the acquired information is concerned.

Teaching methods

Frontal lectures to be performed also during excursions.

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Programme of environmental modelling course

Course objectives

The course aims at providing basic mathematical tools for:

1) exploring and simulating the dynamic of ecosystems and forecasting their evolution in relation to the main antrophic and climatic forcings such as air and water temperature;

2) simulating the dispersion of chemicals within environmental media and theri bioaccumulation in the food web, with focus on coastal-marine ecosystems.

Pre-requirements

Basic calculus: real functions of real variables, ordinary and partial derivatives, integrals. Linear algebra: basic vector/matrix operations.

Contents

1) Theoretical backgorund:

Ordinary Differential Equations (ODE). First order linear ODE.

1D and 2D dynamic systems. Equilibria and their stability. 2D linear systems: trajectories and orbits. 2D non-linear systems: numerical analysis.

2) Applications:

Fate of Persistent Organic Pollutants in the environment;

Population dynamic models;

Modelling biogeochemistry and lower trophic level in marine ecosystems;

3) Model calibration, validation and Goodness of Fit indicators.

Referral texts : Lecture notes provided by the teacher.

Type of exam : written

Assessment methods

Students will be assessed on the basis of:

1) a written test, including exercises requiring the application of the main theoretical concepts presented in the course;

2) a written report concerning the fitting of a simple model to a given data set.

Teaching methods

The main theoretical concepts will be introduced in class lectures, using also slides which will be given to the students.
Hands.on session, in which a freely available software will be used for solving dynamic systems and analysing orbits and trajectories.

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Espace dédié à la recherche bibliographique à l'université Ca'Foscari (Mestre)

Catalogue en ligne des documents bibliographique (Mestre)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[01/10/2017]** till **[15/10/2017]**
Duration (days) – excluding travel days: …14 days……

The Staff Member

Last name (s)	BENAMMI	First name (s)	MOHAMED
Nationality	Moroccan	Academic Year	2017 - 2018
Position	PROFESSOR		
E-mail address	Mohammed.benammi@uit.ac.ma		

The sending university

Name	Université Ibn Tofail
Faculty/Department	Faculté des sciences / Département de Géologie
Address	BP 133 – Kénitra 14 000
Country	Morocco

Contact person

First/Last name(s)	Carlo Giupponi
Position	Professor

The receiving university

Name	Ca'Foscari
Faculty/Department	Dipartimento di Scienze Ambientali, Informatica e Statistica
Address	Campus scientifico via Torino - Mestre
Country	Italy

Contact person

First/Last name(s)	Roberto PASTRES
Position	Professor

Type of mobility

x Technical skills
Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

- ✓ To perform new technical skills in GIS and land managment
- ✓ To see for new pedagogical methods in scientific learning
- ✓ To see for forward cooperation with other professors in different subjects

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	01/10/2017	Voyage
2	02/10/2017	- Réception par le professeur **Roberto Pastres**, discussion des modalités de déroulement du séjour et présentation du département et des professeurs concernés
3	03/10/2017	- Séance de travail avec le Professeur **Carlo Giupponi** dans son bureau à la faculté d'Econome à Venise - Séance de travail avec le Professeur **Angello Rubino**
4	04/10/2017	- Suivi du cours du Pr. **Carlo Giupponi** intitulé : "*Methdologies for teritotial analysis with GIS hands-on session*" - Suivi du cours du Pr. **Angello Rubino** intitulé : "*Climatology"*
5	05/10/2017	- 1ére Session de travail avec le Professeur **Carlo Giupponi** dans les locaux du Campus scientifique à Mestre sur l'initiation à QGIS - Recherche documentaire à la bibliothèque du Campus scientifique à Mestre
6	06/10/2017	- Suivi du cours du Pr. **Angello Rubino** - Recherche documentaire à la bibliothèque du Campus scientifique à Mestre
7	07/10/2017	Tourisme + shopping
8	08/10/2017	Tourisme + shopping
9	09/10/2017	- Recherche documentaire à la bibliothèque du Campus scientifique à Mestre
10	10/10/2017	- Recherche documentaire à la bibliothèque du Campus scientifique à Mestre

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11	11/10/2017	- Session de travail avec le Professeur **Gabriella Buffa** dans les locaux du Campus scientifique à Mestre sur son enseignement intitulé : « *Landscape planing and managment* » - Suivi du cours du Pr. **Angello Rubino** intitulé : "*Climatology"*
12	12/10/2017	- 2ème Session de travail avec le Professeur **Carlo Giupponi** dans les locaux du Campus scientifique à Mestre sur l'initiation à QGIS
13	13/10/2017	- Recherche documentaire à la bibliothèque du Campus scientifique à Mestre
14	14/10/2017	Tourisme + shopping
15	15/10/2017	Voyage

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

- **Teaching QGIS for upgrading students**
- **Using the new bibliography I downloaded in my courses and my researches.**

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

- ✓ **Sending a report**

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[01/10/2017]** till **[15/10/2017]**
Duration (days) – excluding travel days: 14 days

The Staff Member

Last name (s)	BENMOHAMMADI	First name (s)	AICHA
Nationality	Moroccan	Academic Year	2017 – 2018
Position	Director of team Environnemental Géosciences		
E-mail address	Abenmohammadi@gmail.com		

The sending university

Name	University Ibn Tofail
Faculty/Department	Faculty of Sciences, Département of Geology
Address	Campus Maamora, BP 133, 14000, Kénitra
Country	Morocco

Contact person

First/Last name(s)	Pr. Ait for a Abderrahman
Position	Responsible project Scolamar, Kénitra

The receiving university

Name	Université Ca Foscari
Faculty/Department	Department of Environmental Sciences, Informatic
Address	Via Torino, 155, Venezia,
Country	Italy

Contact person

First/Last name(s)	Pr. Roberto Pastres (Associate Professor)
Position	Coordinator from the hosting of university

The
Type of mobility

☐ Technical skills
x☐ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

-To know pedagogy practiced in the education(teaching) of the similar modules
- Discover the educational tools used in Italy
- See the use (custom) of news (short stories) information technology and communication in modules similar
-discuss with the Italian professors the followed pedagogy and the perspectives of exchange in this domain

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
	01/10/2017	Travel to Venezia
1	02/10/2017	Meeting with Pr. Roberto Pastres and his collaborator, Pr. Pastres is responsible for the project ScolaMAR. He presented us the Ca university ' Foscari and the diverse departments. He also described us diverse programs of dispensed trainings(formations). Among these programs, he targeted those who correspond to our needs formulated by mail e-mail. We also took, with Pr. Pastres, the address and phone number) of all the professors with whom we wish to establish a collaboration.
2	03/10/2017	-Meeting with Madam Patricia Rezente, secretary of the department of the Sciences of the environment, the statistics and the computing. -Taking of the access pass for the library of the University, the code WiFi access and of a discount card to restaurants. - Meeting with Pr. Robbino, oceanographer and study of the perspectives of collaboration. Pr. Robbino, presented to us, the program of his module of Master's degree "oceanography" and suggested attending his courses, for those of us who are interested in this axis;
3	04/10/2017	Courses Pr. Pastres
4	05/10/2017	Courses Pr. Robbino
5	06/10/2017	Research in the libraray in Venezia
	07/10/2017	Discover lagune of Venezia
	08/10/2017	Discover lagune of Venezia
6	09/10/2017	Seminary on the economy of the environment to the faculty of economics, Ca' university foscari of Venice.
7	10/10/2017	Course on the Geomorphology and the sedimentology in Venice
8	11/10/2017	Research in library mestre and venezia
9	12/10/2017	course of Master's degree on the modelling of the climate
10	13/10/2017	Meeting with Patricia Resente
	14/10/2017	Free day
	15/10/2017	Travel to Morocco

Add lines to the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

- Make level our courses of Master's degree with the courses in Europe -Identify the used technical and educational means -Improve the quality of the courses of Master's degree

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

Organizing an internal meeting Exchanges with the colleagues of the department on the pedagogy

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

(CF. Report)

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RAPPORT DE MISSION
DU PROFESSEUR ZIDANE LAHCEN

Introduction

Dans le cadre du projet ScolaMAR-Innovative training for Smart coastal management and Sustainable blue growt, ERASMUS PLUS Programme, nous avons participé aux activités pédagogiques avec deux collègues italiens notamment les professeurs Roberto PASTRES et RUBINO Angelo.

Déroulement du programme

-Lundi 02/10/2017 :

- Réception au campus universitaire Ca Foscari de Mestre par le professeur Roberto PASTRES. (Visite du campus universitaire de Mestre).
- Etablissement d'un programme de travail (cours sur les changements climatiques.

-Mardi 03/10/2017

- Réception au secrétariat par Mme Patrizia Resente à 10 h (carte d'accès à la bibliothèque et carte de restauration).
- Réception au campus universitaire de Mestre par le professeur RUBINO Angelo à 16h.
-Etablissement d'un programme de travail (cours de climatologie et cours d'océanographie).

-Mercredi 04/10/2017

- Cours de climatologie (10h 30 à 12h) Pr. RUBINO
- Cours d'océanographie (12h 15 à 13h 30) Pr. RUBINO
-Après midi recherches bibliographiques (bibliothèque Mestre)

-Jeudi 05/10/2017

- Cours sur les changements climatiques 10h 30 à 12h (Pr. PASTRES)
-Après midi : bibliothèque (campus universitaire Mestre)

-Vendredi 06/10/2017

- Bibliothèque (campus universitaire Mestre) 10h à 16h

-Lundi 09/10/2017

-Bibliothèque du Musée d'histoire naturelle (**Venise**) 10 à 15h

-Mardi 10/10/2017

-Bibliothèque du Musée d'histoire naturelle (**Venise**) 10 à 15h

-Mercredi 11/10/2017

- Cours de climatologie (10h 30 à 12h) Pr. RUBINO
- Cours d'océanographie (12h 15 à 13h 30) Pr. RUBINO
-Après midi recherches bibliographiques (bibliothèque Mestre)

-Jeudi 12/10/2017

- Cours sur les changements climatiques 10h 30 à 12h (Pr. PASTRES)
-Après midi : bibliothèque (campus universitaire Mestre)

-Vendredi 13/10/2017

-Bibliothèque (campus universitaire Mestre) 9h à 12h

-Signature au secrétariat de mon attestation de présence (14h)

Conclusion

Au terme de cette mission nous avons pu échanger des idées et des points de vue en matière d'enseignement et de recherche.

Signé : ZIDANE Lahcen

MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[25/ March/2018]** till **[08/April/2018]**
Duration (days) – excluding travel days: 14

The Staff Member

Last name (s)	Boulaassal	First name (s)	Hakim
Nationality	Moroccan	Academic Year	20017- 2018
Position	Associate professor		
E-mail address	hakim.boulaassal@gmail.com		

The sending university

Name	Université Abdelmalek Essaâdi
Faculty/Department	Faculté des Sciences et techniques Tanger/ Sciences de la Terre
Address	BP. 416- Tanger -Maroc
Country	Morocco

Contact person

First/Last name(s)	Pr. Bouchta El Moumni
Position	Coordinator of SCOLAMAR activities for UAE University

The receiving university

Name	Università Ca'Foscari Venezia
Faculty/Department	Campus Scientifico, Via Torino / Department of Environmental Sciences, Informatics and Statistics
Address	Campus Scientifico, Via Torino, 155, 30172 Mestre (VE) Italia
Country	Italy

Contact person

First/Last name(s)	Pr. Roberto Pastres
Position	Coordinator of SCOLAMAR activities for Ca' Foscari University of Venice

Type of mobility

☒ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The main objective of my mobility is to attend lectures and courses of professor Buffa Gabriella that she is teaching in Master's Degree Program (DM270) in Environmental Sciences, Curriculum Evaluation and management of environmental systems. This course is intitled: Landscapes planning and management. The course objectives is to learn how to find, analyze and use ecological data for the landscape assessment and management. Besides, the principles and methods of landscape ecology and plant community ecology, the professor explains, through cases study, how we would be able to recognize landscape elements and evaluate landscape quality to take a good decision concerning management.

The course aims at developing the ability to:
- Analyze landscape using an ecological approach;

- Interpret landscape changes;

- Organize and use ecological data for the biodiversity conservation at the species, community and landscape level;

- Organize and use ecological data for the landscape planning and management;

- Plan a long-term sustainable use of natural resources;

- Plan and design ecological network.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	26/03/2018	First meeting with Pr. Buffa Gabriella. She received me in her office. We established the planning of my activities during the 2 weeks of my visit. Then, Professor Buffa explained me the general goal of her course.
2	27/03/2018	The professor introduced the content of her course and she made presentation in English of the main chapters. Then she gave me a digital version of all chapters to study more in details. She also gave some references to study, among others: - Landscape ecology and resource management: linking theory with practice (JA.Bissonette and I. Storch., 2003) - Preserving Biodiversity: Species, Ecosystems, or Landscapes? (Jerry F. Franklin, 1993) - Landscape modification and habitat fragmentation: a synthesis (Joern Fischer* and David B. Lindenmayer, 2007) - Spatial Scaling in Ecology (J. A. Wiens, 1989) - Habitat fragmentation causes immediate and timedelayed - Biodiversity loss at different trophic levels (Jochen Krauss et al., 2010)

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3	28/03/2018	- Visit of visit of the scientific campus library located at the "ALPHA" building - Study of evaluation and management of environmental and ecological sustainability from different point of view: territorial analysis methods, ecology of environmental restoration, biology and fauna management and evaluation and management of environmental sustainability.
4	29/03/2018	Class with professor Buffa Gabriellla (Master Degree). I attended the Buffa course talking about the Landscape Pattern and Landscape metrics. During this session,,Professor explained landscape ecology and she emphasized the interactions between spatial patterns and ecological processes. Because understanding and quantifying spatial patterns makes it possible to connect them to processes.
5	30/03/2018	Study of two chapters from the book - Landscape ecology and resource management: linking theory with practice (JA.Bissonette and I. Storch., 2003): - Modeling multiple ecological scales to link landscape theory to wildlife conservation. Part 1: conceptual and quantitative linkages (page 153). - Linkage a Multiscale habitat concept to species conservation. Part 3, linking theory and application: case studies (page 303).
6	02/04/2018	Public holiday. Visiting the Venice city to see the landscape management in the border of major rivers and canals. - Study of the paper Spatial Scaling in Ecology (J. A. Wiens, 1989)
7	03/04/2018	Meeting with Professor RAMPAZZO Giancarlo (geologist) and Professor Buffa. We discussed about the role of spatial information in the coastal landscape studies. As a professor and researcher in geomatics, I gave my point of view about many techniques of data acquisition such as GNSS, remote sensing, geodesy, Lidar…which can contribute efficiently in evaluation and assessment of many coastal landscapes issues such as: erosion, climate change, coastal planning…etc. The discussion was very fruitful.
8	04/04/2018	Study of the lesson "scale" given by Professor: -The concept of pattern and scale in ecological management. This problem unifies population biology and ecosystems science and marries basic and applied ecology. -The interfacing of phenomena that occur on very different scales of space, time, and ecological organization are necessary to any applied challenge. - Multiple scale: there is no single natural scale at which ecological phenomena should be studied; systems generally show characteristic variability on a range of spatial, temporal, and organizational scales.
9	05/04/2018	Class with Professor Buffa (Master Degree). In the session, the professor introduced the paradigm of fragmentation which involving consequences on different processes and levels of ecological organization. She talked about the habitat and isolation of populations. She also introduced the patch concept used in the landscape management and planning
10	06/04/2018	- Meeting with Professor Pastres, local coordinator of Scolamar project. We discussed about the add value of this mobility and how it can be useful for the scolamar project. - Visiting the research laboratory of the Professor Buffa and meeting with Phd students. - Discussion with professor Buffa about the practical part of this course. Therein, the professor explained she adopt the case studies approach which involves the data collection from the area study (terrain part) and analysis of different data based on GIS tools in class. The practical part is done on groups.

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

This mobility was a good opportunity for me to discover other aspects of landscape planning and management. On the technical skills level, I learned new concepts and approaches regarding the landscape management from ecological point of view.

By attending the courses' Buffa, I appreciated her pedagogical approach based on linking the theory with practical through case studies and examples. The class is very interactive thanks to teacher's questions.
This is the second added value of my mobility.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

I plan to organize internal meeting to discuss my experience I acquired, through this mobility, with my colleagues from both department of earth sciences and the Department of Biology to expose them this teaching approach as well as the technical content in order to see their points of view. Then, I intend to add the most relevant parts I studied during this mobility to the module to be taught. More particularly, to propose related cases of studies.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	GNSS : MARITIME AND COASTAL APPLICATIONS
Thematic(s)	GLOBAL NAVIGATION SSATELLITE SYSTEMS/ LANDSCAPE MANAGEMENT
Type of module *(Select one or more boxes)*	☒ Lecture course ☒ Tutorial exercice ☒ Practical exercice ☐ Group workshop ☒ Field trip ☐ Other – precise:

Teaching manager	BOULAASSAL HAKIM
Speakers *(Precise if external speakers)*	

Year / Semester	FIRST YEAR / SEMESTER 2
Number of hours	60 H
Number of groups	2

Objectives	1-STUDY THE ELLIPSOID THE MATHEMATICAL REFERENCE SURFACE MODELING THE EARTH. 2- STUDY THE COMPONENTS OF GNSS SYSTEMS AND THEIR OPERATING PRINCIPLES 3- STUDY THE DIFFERENT POSITIONING MODES 4- KNOW HOW TO ESTIMATE MARINE NAVIGATION PARAMETERS SUCH AS: HEADING, ROAD, SPEED, DRIFT,...ETC. 5- USE GNSS DATA TO SURVEY UNDERWATER, PLACE BUOYS, LOCATE NAVIGATION AND MAP HAZARDS, USE GNSS IN RESCUE OPERATIONS 6- USE GNSS TO GET ACCURATE SPATIAL INFORMATION NECESSARY TO COASTAL LANDSCAPES MANAGEMENT 7- USE GNSS TO MONITORING THE COASTAL LANDSCAPES

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Content	THIS COURSE FOCUSES ON THE USE OF DIFFERENT SATELLITE POSITIONING AND NAVIGATION SYSTEMS IN DIFFERENT MARINE APPLICATIONS AS WELL AS THE COASTAL MONITORING. FOR A GOOD UNDERSTANDING AN USING OF THESE SYSTEMS, A SOLID BASE IN GEODESY IS NECESSARY. AS A RESULT, THIS MODULE IS STRUCTURED AROUND TWO MAIN PARTS, NAMELY: GEOMETRICAL GEODESY AND SPATIAL GEODESY. FOR GEOMETRICAL GEODESY, THE OBJECTIVE IS TO INTRODUCE THE NECESSARY TOOLS TO STUDY THE SIMPLE MATHEMATICAL SURFACE THAT REPRESENTS THE EARTH, THE ELLIPSOID WHICH IS CONSIDERED AS A REFERENCE SURFACE FOR ALL GNSS SYSTEMS. SPATIAL GEODESY, MEANWHILE, IS DEVOTED TO THE STUDY OF DIFFERENT SATELLITE POSITIONING AND POSITIONING SYSTEMS AND TECHNIQUES. ATTENTION WILL BE FOCUSED ON SEVERAL MARITIME APPLICATIONS OF THESE SYSTEMS INCLUDING GPS AND GLONASS. ACQUISITION TECHNIQUES AS WELL AS THE PROCESSING OF GEOLOCATION DATA ACQUIRED BY GNSS TAKE INTO ACCOUNT CHARACTERISTICS OF MARINE ENVIRONMENTS THAT ARE DIFFERENT FROM CONTINENTAL ENVIRONMENTS. AT THE END, THE PRATCTICAL CASE STUDIES REGARDING COASTAL LANDSCAPE MANAGEMENT ARE SUGGESTED IN THIS COURSE.
Teaching methods	LECTURES, PARCTICAL EXERCICES, FIELD TRAINING
Knowledge required	BASIC NOTIONS IN MATHEMATICS AND GEOMETRY BASIC NOTIONS ON ELECTROMAGNTISM
Skills required	SKILLS IN COMPUTER SCIENCES
Equipment required	
Type of evaluation *(Select one or more boxes)*	☐ Oral – precise: ☒ Written – precise: ☒ Other – precise:practical trainning
Comments on evaluations *(Precisions on criteria)*	Written (60%) and practical trainning (40%)

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **19/04/2018** till **3/05/2018**
Duration (days) – excluding travel days: **13**

The Staff Member

Last name (s)	DAMNATI	First name (s)	Brahim
Nationality	Moroccan	Academic Year	2017 - 2018
Position	Professor		
E-mail address	b_damnati@yahoo.fr		

The sending university

Name	Abdelmalek Essaadi University
Faculty/Department	Department of Earth Sciences. Faculty of Sciences and Techniques
Address	B.P 416. Tanger 90000
Country	Morocco

Contact person

First/Last name(s)	El Moumni Bouchta
Position	Professor

The receiving university

Name	Università Ca 'Foscari Venezia
Faculty/Department	Environmental Sciences, Informatics and Statistics
Address	Scientific Campus, Via Torino 155,30172, Maestre (Venezia)
Country	Italia

Contact person

First/Last name(s)	Roberto PASTRE
Position	Professor

Type of mobility

☒ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

The objectives of my module in climate change:

It will allow the student:

* To acquire basic knowledge in climatology and paleoclimatology.
* Know the parameters that control the climate.
* To understand how the climate has varied over the course of Earth's history
* To also understand the relationship between air pollution and global warming.
* To become familiar with climate data and models
* To raise awareness about the problems of climate change

Our mission allowed us to take an example of the impact of climate change on the environment, namely the impact on the coasts and the study of the two related risks:
The risk of sea level rise and the risk of erosion.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	19/04/2018	Arrival to Venezia at 8 pm. Installation. Campo Universitario St Toma. Venezia
2	20/04/2018	Visit of the Deparment Visit of the Università Ca Foscari The reception of the welcome Kit Visit of the Library
3	23/04/2018	Courses: Environmental impacts related to climate change: Example of coastal climatic change impact assessment THE DSS DESYCO: DECISION SUPPORT SYSTEM FOR COASTAL CLIMATIC CHANGE IMPACT ASSESSMENT:

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		IDENTIFY, PRIORITIZE AND VISUALIZE AREAS AND TARGETS AT RISK FOR CLIMATE CHANGE IMPACTS ON COASTAL AREAS AND RELATED ECOSYSTEMS
4	24/04/2018	Application and training : The application of THE DSS DESYCO: DECISION SUPPORT SYSTEM FOR COASTAL CLIMATIC CHANGE IMPACT ASSESSMENT • METHODOLOGY STEPS • HAZARD SCENARIO ASSESSMENT • EXPOSURE ASSESSMENT • SCENARIO DEFINITION • STORM SURGE
5	25/04/2018	Application and training : The application of THE DSS DESYCO: DECISION SUPPORT SYSTEM FOR COASTAL CLIMATIC CHANGE IMPACT ASSESSMENT THE CASE STUDY AREA/ EXAMPLE OF THE COASTAL ZONE OF VENETO AND FRIULI-VENEZIA GIULIA REGION (BORDERING THE NORTH ADRIATIC SEA).
6	26/04/2018	Holiday (Independence Italy day)
7	27/04/2018	Application and training : The application of THE DSS DESYCO: DECISION SUPPORT SYSTEM FOR COASTAL CLIMATIC CHANGE IMPACT ASSESSMENT "SUITE" THE CASE STUDY AREA/ EXAMPLE OF THE COASTAL ZONE OF VENETO AND FRIULI-VENEZIA GIULIA REGION (BORDERING THE NORTH ADRIATIC SEA). • HAZARD SCENARIOS FOR STORM SURGE
8	30/04/2018	Discussion about the courses and the application of the DSS DESYCO at the Department Environmental Sciences, Informatics and Statistics: possible application on some Mediterranean Moroccan sites?
9	1/05/2018	Holiday (first of May: Labor Day)
10	2/05/2018	Discussion about the courses and the application of the DSS DESYCO at the Department Environmental Sciences, Informatics and Statistics. Visit some laboratories Future collaboration
11	3/05/2018	Departure

Add lines to the table if needed.

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ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

The Mobility gives me the opportunity to give some examples of the climatic impact like storm storage and costal erosion.

The possibility of our university to offer a master in Scolamar project and try to give and apply this program by the students of this master on Moroccan sites: example site of Tangier, Tetouan and Al Houceima .
But first you need to have the agreement to use this computer program and more time to understand it well..

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

The dissemination will be done mainly by the courses that I will give in the framework of climate change module within the framework of my current courses or in the framework of the future master that our university will consider opening within the framework of this scolamar project.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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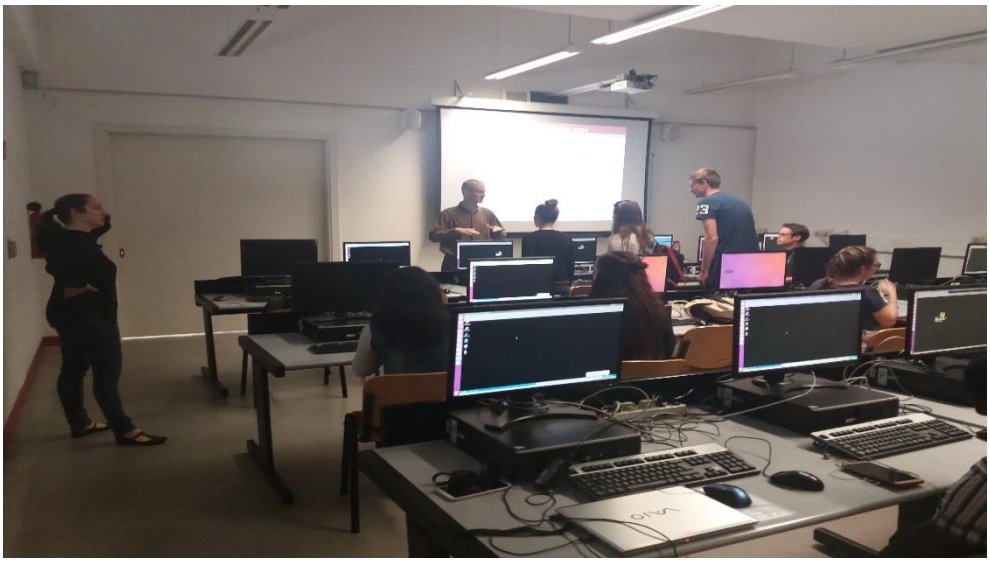
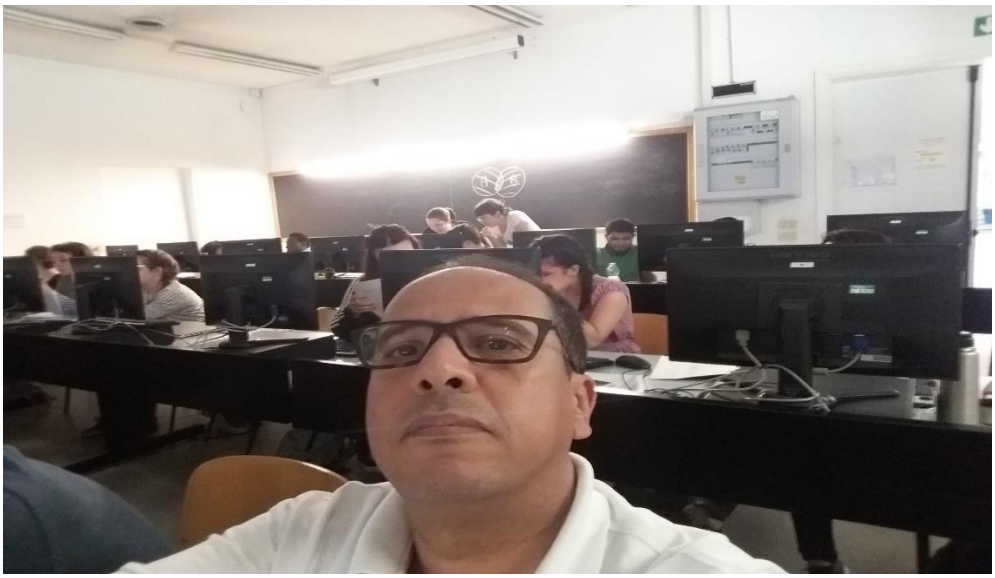
ScolaMAR
Erasmus+ Capacity building

Some photos: courses and practices.





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ScolaMAR

Erasmus+ Capacity building

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	CLIMATE CHANGE
Thematic(s)	CLIMATE CHANGE
Type of module *(Select one or more boxes)*	☒ Lecture course ☐ Tutorial exercice ☒ Practical exercice ☐ Group workshop ☐ Field trip ☐ Other – precise:

Teaching manager	PROF BRAHIM DAMNATI
Speakers *(Precise if external speakers)*	

Year / Semester	2018/2
Number of hours	60 H
Number of groups	1

Objectives	• It will allow the student: • To acquire basic knowledge in climatology and paleoclimatology. • Know the parameters that control the climate. • To understand how the climate has varied over the course of Earth's history • To also understand the relationship between air pollution and global warming. • To become familiar with climate data and models • To raise awareness about the problems of climate change
Content	**CHAPTER1: WHAT ARE THE MAIN CAUSES OF NATURAL CLIMATE CHANGE?** • 1. PLATE TECTONICS: CONTINENTAL DRIFT AND PALEOGEOGRAPHY • 2. ASTRONOMICAL CAUSES • A. THE CLIMATE AND THE PRECESSION OF THE EQUINOXES • B. THE CLIMATE AND THE INCLINATION OF THE AXIS OF THE EARTH • C. THE CLIMATE AND ECCENTRICITY OF THE ECLIPTIC • D. THE MILANKOVITCH THEORY

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- 3. VOLCANISM
- 4. ALBEDO
- 5. COLLISION OF THE EARTH WITH A METEORITE
- 6. SOLAR ACTIVITY
- 7. CONCLUSION

CHAPTER 2: HOW TO RECONSTRUCT THE PAST CLIMATE?

- INTRODUCTION
- I. CLIMATE INFORMATION
- I.1. SOURCES OF CLIMATE DATA
- I. 2. THE NATURAL ARCHIVES
- A. GEOMORPHOLOGY AND SEDIMENTOLOGY
- B. OCEAN SEDIMENTS
- C. CORAL REEFS
- D. ICE PRESERVES FOSSIL AIR
- E. THE LACUSTRINE ARCHIVES
- E.1. POLLEN
- E.2. DIATOMS
- F. LOESS
- G. DENDROCLIMATOLOGY
- H. HISTORICAL DOCUMENTS
- I. SPELEOTHEMS: STALAGMITES STALACTITES
- II. SOME METHODS OF PROXY-DATA ANALYSIS
- 1. THE DIVERSITY OF OCEAN FAUNA AND CLIMATE
- 2. ISOTOPES OF OXYGEN
- III. DATING OF PALEOCLIMATES
- IV. CONCLUSION

CHAPTER 3: FUTURE CLIMATE CHANGE “THE NEW CLIMATE”?

- INTRODUCTION
- 1. WHAT IS THE EFFECT OF THE “GREENHOUSE”
- 2. THE MAIN GREENHOUSE GASES (GHGS)
- AT. WATER VAPOUR
- B. CARBON DIOXIDE (CO2)
- C. METHANE (CH4)
- D. NITROUS OXIDE (N2O)
- E. CHLOROFLUOROCARBONS (CFCS)
- F. OZONE (O3)
- 3. IS MAN RESPONSIBLE FOR THE EFFECT OF GREENHOUSE?
- 4. ALBEDO CLOUDS
- 5. RECENT DEVELOPMENTS IN CARBON DIOXIDE, METHANE AND NITROUS OXIDE
- 5.1. EVOLUTION OF CARBON DIOXIDE
- 5.2. WELLS OF CARBON DIOXIDE
- 5.3. EVOLUTION OF METHANE AND NITROUS OXIDE
- 6. IS THE CURRENT CLIMATE CHANGING?
- 7. CLIMATE MODELS
- 8. CONSEQUENCE OF THE CLIMATE IMBALANCE
- AT. TEMPERATURE
- B. RAINFALL
- C. WATER RESOURCES
- D. DESERTIFICATION

	• E. ELEVATION OF THE SEA LEVEL • F. AGRICULTURE • G. ECOSYSTEMS • H. FAUNA AND FLORA • I. HEALTH • J. TOWN PLANNING • K. EXTREME EVENTS • 9. ARE THERE ANY ANALOGIES WITH PAST CLIMATE? • 10. CONCLUSION **CHAPTER 4: THE CASE OF MOROCCO AGAINST THE FUTURE CLIMATE CHANGE** • INTRODUCTION • 1. POLITICS AND CLIMATE: FROM KYOTO PROTOCOL TO COP23 • 1.1. THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE • 1.2. KYOTO PROTOCOL (PK) • 1.3. COP 7 IN MARRAKECH • 1.4. CLEAN DEVELOPMENT MECHANISM (CDM) • 2. MOROCCO AND CLIMATE CHANGE • 3. WHAT DO CLIMATE MODELS PREDICT FOR MOROCCO BY 2100? • 4. IS MOROCCO VULNERABLE TO CLIMATE CHANGE • 5. MOROCCO FACING POSSIBLE IMPACTS TO CLIMATE CHANGE • AT. IMPACTS ON WATER RESOURCES • B. IMPACTS ON AGRICULTURE • C. IMPACTS ON FORESTS • D. IMPACTS ON ECOSYSTEMS AND BIODIVERSITY • E. OTHER IMPACTS • 6. SOME ADAPTATION MEASURES OF MOROCCO TO CLIMATE CHANGE • 7. CONCLUSION **EXERCICES: CASE STUDY** * TD1: QUATERNARY CLIMATE VARIATIONS TO DATE: A GLOBAL AND REGIONAL OVERVIEW (AFRICA). * TD2: CLIMATE CHANGE IN MOROCCO SINCE THE LAST GLACIATION UNTIL NOW. * TD3: VULNERABILITY OF MOROCCO TO FUTURE CLIMATE CHANGE. *TD4: AN EXAMPLE OF COASTAL CLIMATIC CHANGE IMPACT ASSESSMENT
Teaching methods	• CLASSES ARE HELD IN THEATERS USING AUDIO-VISUAL AND MULTIMEDIA MEANS (DATA SHOW OVERHEAD PROJECTORS). • ALL THE THEORETICAL COURSES ARE COMPLETED BY TUTORIALS AND ALSO BY SURVEYS OF THE POPULATION.
Knowledge required	* BASICS IN GEOSCIENCES (GEOCHEMISTRY, GENERAL GEOLOGY, TECTONICS, ...)

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	* BASIC CONCEPTS IN ENVIRONMENT (NOTION OF ENVIRONMENTS, ECOSYSTEMS, CYCE OF WATER ...) * BASICS IN BIOLOGY (ANIMAL AND PLANT BIOLOGY) * BASIC NOTIONS IN CHEMISTRY (ATOMS, ANALYTICAL CHEMISTRY ...) * BASICS IN PHYSICAL GEOGRAPHY * BASIC NOTIONS OF METEOROLOGY * GIS (GEOGRAFICAL INFORMATION SYSTEM)
Skills required	* BASICS IN GEOSCIENCES (GEOCHEMISTRY, GENERAL GEOLOGY, TECTONICS, ...) * BASIC CONCEPTS IN ENVIRONMENT (NOTION OF ENVIRONMENTS, ECOSYSTEMS, CYCE OF WATER ...) * BASICS IN BIOLOGY (ANIMAL AND PLANT BIOLOGY) * BASIC NOTIONS IN CHEMISTRY (ATOMS, ANALYTICAL CHEMISTRY ...) * BASICS IN PHYSICAL GEOGRAPHY * BASIC NOTIONS OF METEOROLOGY * GIS (GEOGRAFICAL INFORMATION SYSTEM) * COMPUTERS-SOFTWARE
Equipment required	COMPUTERS-SOFTWARE
Type of evaluation *(Select one or more boxes)*	☐ Oral – precise: ☒ Written – precise: two continuous controls: Continuous Control 1: Exercise 1 on a summary topic and Exercise 2 on tutorials (50%). Continuous Control 2: An exercise 1 on a synthesis topic and a 2 exercise on tutorials. (50%). ☐ Other – precise:
Comments on evaluations *(Precisions on criteria)*	

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[10/April/2018]** till **[24/April /2018]**
Duration (days) – excluding travel days: 13 days

The Staff Member

Last name (s)	KHADDOR	First name (s)	MOHAMED
Nationality	Morocco	Academic Year	2017 - 2018
Position	Professor		
E-mail address	mohamedkhaddor@yahoo.fr		

The sending university

Name	University Abdelmalek Essaâdi
Faculty/Department	Faculy of sciences and technology/Chemistry
Address	Road Ziaten, PB. 416, Tangier
Country	Morocco

Contact person

First/Last name(s)	**Pr. Bouchta El moumni**
Position	Professor

The receiving university

Name	**Ca' Foscori University of Venice-Italy**
Faculty/Department	Departement of Environmental Sciences, Informatics and Statistics
Address	Campus Scienfico, via Torino, 155, 30172 Mestre, Venice
Country	Italy

Contact person

First/Last name(s)	ROBERTO PASTERS
Position	Professor

Type of mobility

☒ Technical skills
☒ Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

- Strengthen technical skills in "Environmental Analytical Chemistry".
- Develop the theoretical and practical teaching module on marine and atmospheric pollution.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	11/4/2018	First meeting with Pr. Andea GOMBRARO (module manager) and planning
2	12/04/2018	In Library: study the courses and revision
3	13/04/2018	Practical work: sample preparation for analysis (soil and atmosphere sample)
4	16/04/2018	Discussion on the GC-MS and ICP-Masse course and study the courses in Library
5	17/04/2018	Practical work: GC_MS analysis (triple quadrupole)
6	18/04/2018	Visit the laboratory ICP-Mass and GC-MS (triple quadrupole)
7	19/04/2018	Discussion and interaction about all course
8	20/04/2018	In Library: study the courses and revision
9	23/04/2018	Meeting with Pr. andea gombraro (application of the module in the end of study project)
10	24/04/2018	Final meeting (proposal about a research collaboration)

Add lines to the table if needed.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

- New techniques to add and insert in the module "Environmental Analytical Chemistry" as ICP-MS, TOF (Time of flight), triple quadrupole mass spectrometer.
- Sample preparation methods.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

- Teaching Master's students,
- Organization of seminars (applications of spectroscopic methods, verification of atmospheric and marine pollution in ports ... ..)

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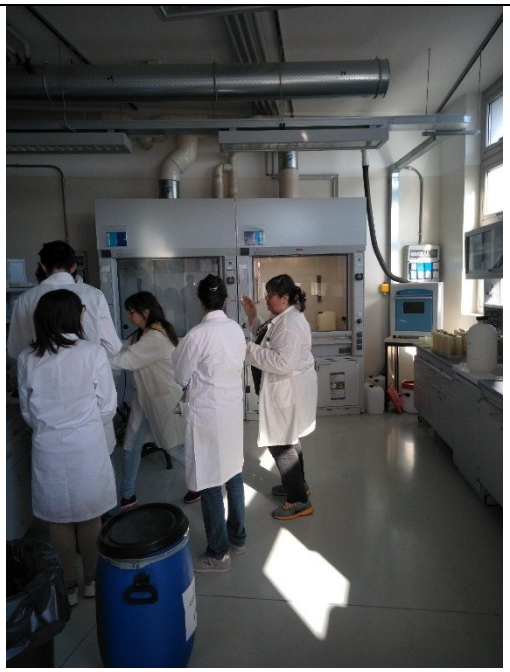
ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)



Sample preparation for analysis
13/04/2018

Sample preparation for analysis
17/04/2018

ICP-MASS (7500a ICP-MS)

Triple Quadrupole Mass Injection

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ASE™ 350 Accelerated Solvent Extractor

Andrea GIACOMETTI translated into English during practical work

In library

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PEDAGOGICAL TOOL-KIT
Teaching module

Module title	ENVIRONMENTAL ANALYTICAL CHEMISTRY
Thematic(s)	THEMATIQUE GLOBALE
Type of module *(Select one or more boxes)*	☒ Lecture course ☐ Tutorial exercice ☒ Practical exercice ☐ Group workshop ☐ Field trip ☐ Other – precise: interaction and discussion about course

Teaching manager	KHADDOR MOHAMED
Speakers *(Precise if external speakers)*	Assisted by a doctoral student

Year / Semester	2018/ SEMESTER 2
Number of hours	60 HEURE
Number of groups	UN GROUPE

Objectives	- Characterization and quantification of chemical species. - Understanding of the phenomena involved in the analysis techniques.
Content	- Generalities on chemical analysis. - Preparation of the sample. - Analytical technique : GC-MS, ICP-MS
Teaching methods	- Lecture. - Presentation prepared by the students. - Seminar.
Knowledge required	- Methods of extraction, separation and purification. - Spectroscopic analysis techniques.
Skills required	knowledge of inorganic and organic pollutants
Equipment required	Soxhlet, Chromatogrphy
Type of evaluation *(Select one or more boxes)*	☐ Oral – precise: ☒ Written – precise: examination ☒ Other – precise: Practical work
Comments on evaluations *(Precisions on criteria)*	Evaluation makes it possible to know the degree of comprehension of the course by students

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

Period of the mobility: from **[05/12/2018]** till **[19/12/2018]**
Duration (14) – excluding travel days: …15…

The Staff Member

Last name (s)	SALMANI	First name (s)	EL MEHDI
Nationality	MAROCAINE	Academic Year	2018- 2019
Position	ASSISTANT PROFESSOR		
E-mail address	elmehdisalmani@gmail.com		

The sending university

Name	MOHAMMED V UNIVERSITY IN RABAT
Faculty/Department	FACULTY OF SCIENCE
Address	Avenue Ibn Batouta, B.P 703, 10106 Rabat
Country	MOROCCO

Contact person

First/Last name(s)	ABDELLAH AMMAR
Position	PROFESSOR

The receiving university

Name	Università Ca' Foscari Venezia
Faculty/Department	Department of Environmental Sciences, Informatics and Statistics
Address	*Università Ca' Foscari Venezia* - Dorsoduro 3246, 30123 Venise
Country	ITALY

Contact person

First/Last name(s)	Roberto PASTRES
Position	PROFESSOR

Type of mobility

☐Technical skills
☐Innovative pedagogical approaches

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MOBILITY AND ACTIVITY REPORT
Job-shadowing

OVERALL OBJECTIVE(S)

Briefly describe the overall objective(s) of your mobility regarding the ScolaMAR project, your module project and your university.

Our objective during the stay period at the university of Ca' Foscari Venezia are to have a global idea about the course to be prepared in the frame of the master: **Environmental Modelling**, and to collect informations by attending some modules concerning the Simulation of the evolution of ecosystems., and disccussing with the scientific researchers in the topic related with the attended modules.
The objectives of Modules related to **Environmental Modelling** are to present the main characteristics and theories describing the dynamics of environmental systems, and the evolution of ecosystems.

MOBILITY PROGRAMME

Describe the program of your mobility and the activities carried out (lessons, meetings, trainings, conferences, field trips)

Day	Dates	Description
1	05/12/2018	Lesson : Environmental Modelling
2	06/12/2018	Lessons : Environmental Modelling
3	07/12/2018	Lessons : Environmental Modelling
4	10/12/2018	Lessons : Environmental Modelling
5	11/12/2018	Lessons : Environmental Modelling
6	12/12/2018	Lesson : Environmental Modelling
7	13/12/2018	Lessons : Environmental Modelling
8	14/12/2018	Lessons : Numerical Modeling.
9	17/12/2018	Lessons : Numerical Modeling
10	18/12/2018	Lessons : Numerical Modeling.
10	19/12/2018	Lessons : Numerical Modeling.

ADDED VALUE

Explain how your mobility will bring an added value to your teaching module, your university, the ScolaMAR project.

This mobility allows me to bring new experience on the teaching module in the SLAP Master, regarding Environmental Modelling context.

IMPACT

How will you disseminate the result of your mobility (sending a report, organizing an internal meeting) – Precise

We will organize an internal meeting after the mobility of all ScholaMAR members of Mohammed V university, for assessing the balance of our mobilities in the frame of ScolaMAR project.

ANNEXES

Please insert all relevant annexes related to your mobility (documents, pictures, reports)

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