

MASTER THESIS OFFER (2015/2016) MER

30 ECTS: 6 mo

TITLE	DESCRIPTION (5-10 lines)	SUPERV. (Name; Contact e-mail)	LOCATION (Res Grp; Lab, Dept, Inst, City)	FUNDING (if available)	REQUISITES / NAME (if needed /if agreed)
Trends in wave climate over the Northern Atlantic from satellite images	<p>INTRODUCTION: Several research papers [1,2,3,4] suggest that in the North Atlantic, the significant sea wave height (Hs) values exhibit a growing trend during the last decades. Additionally, other studies [5,6] have detected a declining trend below 40° degrees of latitude for the same parameter.</p> <p>GENERAL OBJECTIVE: Identify the significant trends of the wave energy flux (WEF) in the gridpoints covering the area [-100.125E, 10.125E] [81N, 19.125N] corresponding to the period 1993-2008 as seen by satellites.</p> <p>SPECIFIC OBJECTIVES:</p> <ol style="list-style-type: none"> 1. Calculate and map the significant trends of Hs for the area and period as seen by satellites 2. Calculate and map the mean wave period (Tz) significant trends for the area and period as seen by satellites 3. Calculate and map the WEF significant trends for the area and period as seen by satellites <p>REFERENCES</p> <p>[1] Kushnir, Y., V. J. Cardone, J. G. Greenwood, M. A. Cane, 1997: The Recent Increase in North Atlantic Wave Heights. <i>J. Climate</i>, 10, 2107–2113. doi: <a href="http://dx.doi.org/10.1175/1520-0442(1997)010<2107:TRIINA>2.0.CO;2">http://dx.doi.org/10.1175/1520-0442(1997)010<2107:TRIINA>2.0.CO;2</p> <p>[2] Gulev, S. K., and V. Grigorieva (2004), Last century changes in ocean wind wave height from global visual wave data, <i>Geophys. Res. Lett.</i>, 31, L24302, doi:10.1029/2004GL021040.</p> <p>[3] The AES40 North Atlantic Wave Reanalysis: Validation and Climate Assessment; Val R. Swail, Environment Canada, Ontario, Canada, E.A. Ceccacci and A. T. Cox., Oceanweather, Inc., Cos Cob, CT VALIDATION AND CLIMATE ASSESSMENT. 6th International workshop on wave hindcasting and forecasting. http://www.kennisbank-waterbouw.nl/dicea/repository/IWWHF6.htm.</p> <p>[4] Frode Vikebø, Tore Furevik, Gunnar Furnes, Nils Gunnar Kvamstø, Magnar Reistad. 2003. Wave height variations in the North Sea and on the Norwegian Continental Shelf, 1881–1999. <i>Continental Shelf Research - CONT SHELF RES</i> 01/2003; 23(3):251-263. DOI:10.1016/S0278-4343(02)00210-8</p> <p>[5] Xiaolan L. Wang & Val R. Swail & Francis W. Zwiars & Xuebin Zhang & Yang Feng. Detection of external influence on trends of atmospheric storminess and northern oceans wave heights <i>Clim Dyn</i> (2009) 32:189–203. DOI 10.1007/s00382-008-0442-2</p> <p>[6] Xiaolan L. Wang, Yang Feng, V. R. Swail. 2012. North Atlantic wave height trends as reconstructed from the 20th century reanalysis. <i>Geophysical Research Letters</i> Volume 39, Issue 18, September 2012.</p>	<p>Gabriel Ibarra gabriel.ibarra@ehu.es Jon Sáenz jon.saeLiriaz@ehu.es</p>	<p>Research Group: Eolo (UPV/EHU) http://www.ehu.es/eolo Laboratory: Research Centre for Experimental Marine Biology and Biotechnology, Plentzia, Spain http://www.ehu.es/PIE/overiew/index.html Department: Nuclear Engineering and Fluid Mechanics and Applied Physics II Institution: University of the Basque Country (UPV/EHU) http://www.ehu.es City: Plentzia-Bilbao</p>	NA	<p>An intermediate level of the freely available software R http://cran.r-project.org/ is needed. In this website, a whole set of useful materials can be found. As a reference, among many others, the following tutorial as given in MER during this course by the supervisors may be helpful ftp://ftp.ehu.es/cidirb/p/rofs/inpibbeg/sea_wave_energy/MER_2013_tutorial/</p>
Yellowfin Stock Structure study in the Western Indian Ocean using trace element analysis in	<p>The assessment of the yellowfin tuna population in the Indian Ocean is based on the assumption that it constitutes a single stock. However, there is not sufficient information to confirm accurately this hypothesis, and several studies suggest that the population and spatial dynamics could be more complex in the Indian Ocean (Dammannagoda et al., 2008; Chow et al., 2000; Kunal et al., 2013). Analyzing trace element signatures in fish otoliths is a chemical</p>	<p>Igaratza Fraile (ifraile@azti.es); Hilario Murua (hmurua@azti.es)</p>	AZTI	AZTI	<p>Iraide Artetxe Marine Biology, Chemistry, Ecology, R, Statistics.</p>

otoliths	method to determine the distribution of a fish across time and space. The core of the otolith is the signature of the water mass where the fish were spawned and the edge is the signature of the water mass where the fish were collected. By analyzing chemical composition of yellowfin tuna otoliths collected over a latitudinal gradient of the western Indian Ocean, we aim to investigate the connectivity between tuna captured in different regions and the spatial dynamics of potential subpopulations. Trace element composition of yellowfin tuna otoliths (N=127) have been measured using laser-ablation-inductively-coupled-mass-spectrometry (LA-ICPMS). Otolith material was ablated from the core to the edge at a speed of 6µm/s measuring the concentration of elements continuously. During the present project, the student will isolate the chemical signature corresponding to core, near-core and edge regions of the otolith by measuring the distance from the core under a microscope. Using multivariate statistics the student will detect differences in habitat utilization and ultimately investigate possible subpopulation structure of yellowfin tuna in the western Indian Ocean.				
Could juvenile anchovy distributions be inferred from physical data?	Ocean dynamics results from a complex combination of different processes acting in a wide range of scales. Non-uniform distribution of waters masses, ocean currents and vertical motions have been shown to be key for the modulation of biological activity in the ocean. The main objective of this work will be to identify and understand the key physical processes affecting the distribution of anchovy juveniles in the Bay of Biscay. This will be conducted using historical data series from in-situ and satellite observations, describing, on one hand, the acoustic survey based spatial distribution of anchovy juvenile biomass and, on the other, several physical ocean properties such as: salinity, temperature, ocean currents and fluorometry. The presence of coherent structures in the ocean, as mesoscale fronts and eddies, and their effect on the biological distributions through retention and/or enrichment of surface waters will be particularly investigated. This work will provide a novel multidisciplinary approach to the ocean biological-physical (sub)mesoscale interactions in the area.	Anna Rubio (arubio@azti.es) /Ainhoa Caballero (acaballero@azti.es) /...	FEM & TM AZTI (Pasaia)	AZTI	Programming (Matlab, and/or R) AZTI (Pasaia)
Elaboración de una metodología para el seguimiento de la calidad de la ola de Mundaka desde el punto de vista del surf	La problemática surgida tras el comienzo de los trabajos de regeneración de la playa de Laida pone de manifiesto la importancia creciente que tienen en nuestras costas los nuevos grupos de usuarios del mar ligados principalmente al ocio, así como, su gran impacto en la opinión pública. Es por ello, que valorar estos recursos así como implicar a dichos usuarios en su gestión y compatibilización con el resto de actividades, es una tarea pendiente que necesita ser acometida urgentemente. El enfoque además debe ser doble, por un lado captar el conocimiento y las necesidades específicas de estos usuarios para anticiparse a los problemas y por otro lado, adaptar el conocimiento científico existente para que realmente pueda ser utilizado. Seguimiento de la calidad de la ola de Mundaka: Se realizará un seguimiento de la calidad de la ola para el surf basado en la medida de los parámetros básicos de "peel angle" (Walker 1974) y distancia surfable a partir de las imágenes de la estación video y las salidas de los modelos de simulación. Se compararán estos valores tras la actuación de regeneración de la playa de Laida, al principio de la nueva temporada (otoño) con los valores habituales registrados durante los últimos años y reflejados en distintos informes técnicos de AZTI (Liria et al 2008). Implicación de los usuarios: Se realizarán distintos contactos así como un taller específico con un grupo representativo de los usuarios de la ola (Mundaka Surf Taldea y otros surfistas destacados) para validar conjuntamente dichos parámetros de seguimiento así como otros posibles métodos para trasladar la	Irati Epelde/Pedro Liria	AZTI (Pasaia)	AZTI	Programación (Matlab) Conocimientos de morfodinámica litoral. Surfista! Fermin Alvarez Agoues

	sensación subjetiva del usuario habitual en cuanto al estado de la ola a una metodología de seguimiento. Entre estos parámetros adicionales estarán algunos como la intensidad, grado de dificultad o longitud y amplitud del tubo de las distintas secciones más habituales de la ola. El objetivo final será definir una metodología de trabajo para el seguimiento a futuro de la calidad de la ola de Mundaka desde el punto de vista del surf que incluya la información de los usuarios habituales.				
Analysis of interactions between aquaculture and other marine activities in the Basque continental shelf	The increasing demand for sea-space for existing and new economic activities and the necessity of the maintenance of the marine conservation status will have impacts on the development of such activities. As a consequence, it is important to understand the potential interaction between the maritime uses as a way of exploring the potential conflicts (and solutions if needed). The focus of this research is to investigate the interactions between the marine aquaculture sector and other activities with special emphasis on artisanal fishing activities. The Southern Eastern part of the Bay of Biscay, which supports a high level of fishing and other uses along the continental shelf, is adopted as a case study. The student will aim at: (i) data issues: analysis of the data needed (aquaculture sites, cultivated species, human activities, etc.); (ii) mapping the main variables related to the activities development (location, economics, effort for fisheries, etc.); (ii) spatial analysis of the interactions between activities; (iii) assess the potential conflicts of uses and the fishing effort displacement as a consequence of the aquaculture activities with the corresponding impact on both activities, and finally, (iii) main results will be analysed.	Ibon Galparsoro & Arantza Murillas	AZTI Tecnalia; Pasaia/Sukarrieta	AZTI	Interest in Marine Spatial Planning and Geographic Information Systems. Interdisciplinary approach may be appropriate. MARIA SANJAYA
Relationship between at-sea foraging patterns and breeding performance in a pelagic seabird	Pelagic seabirds search widely for food in marine ecosystems and are temporally- and energetically constrained to exploit resources within a restricted area around their nest sites while breeding. Most pelagic seabird species breed in colonies located on remote islands, and intra- and inter-specific competition for food might promote trophic resource depletion and ultimately affect breeding success, survival or recruitment. We will investigate the relationship between the at sea foraging patterns and breeding performance in one of the most endangered European seabirds, the Balearic shearwater <i>Puffinus mauretanicus</i> (ca. 3200 breeding pairs), restricted to the Balearic Islands. First, we will identify overall foraging grounds and fine-scale foraging hotspots of birds from southern populations (Eivissa, Balearic Islands) during breeding tagged with global location sensing (GLS), combining miniature archival light, salt-water immersion loggers and temperature sensors. Second, we will analyse nest attendance to estimate breeding effort at individual nests. Third, we will investigate the relationship between the at-sea foraging patterns, activity and breeding effort to disentangle the main foraging features influencing on the breeding performance. Finally, this comprehensive study will provide information on the habitat use of a critically endangered species with important information for management strategies for its conservation.	Maite Louzao Arsuaga mlouzao@azti.es	AZTI, Marine Ecosystem Functioning, Pasaia	AZTI	Background in marine ecology, R programming, oceanography Lingdi Tan
Statistical analysis of Anchovy Egg mortality and environmental covariates in the Bay of Biscay from BIOMAN Egg Survey	Egg Mortality is a parameter required to obtain Daily Egg Production for the estimation of spawning biomass in Egg surveys. However this is one of the most difficult parameters to estimate due to the spatial & temporal limitations of the egg sampling and the spatial variability of this mortality process. The usual approach to handle this complexity is to assess a single survey egg mortality value common across all sampled areas on a survey by survey basis. The student will have to analyze a set of survey series of egg samples for potential relationships between Egg mortality (Z) and environmental (mainly temperature, salinity,	Andrés Uriarte (auriarte@azti.es)	AZTI Pasaia (Gipuzkoa) SPAIN	AZTI	Good level in statistical analysis with R and GLMs

series	geographic location) or biological (egg abundance of other pelagics) covariates.				
Energy efficiency in fishing	The potential candidate will collaborate with the fishing technology team of AZTI on the elaboration of a peer review scientific paper related to the estimation of the carbon footprint and energy efficiency of the Basque fishing fleet. The candidate will assist on the collection and treatment of data collected from fishing vessels and published databases. Likewise, he/she will participate on promoting the outcomes of the research.	Oihane Cabezas-Basurko ocabezas@azti.es	Marine Technologies, AZTI, Pasaia	AZTI	Basic knowledge on fishing technologies, R or other type of programming language.
Performance and sensitivity of rapid sublethal sediment toxicity tests with the amphipod Corophium sp.	Sublethal whole sediment toxicity tests are important tool for assessing the potential effects of contaminated sediments. However, the longer duration required for evaluating potential chronic effects may increase endpoint variability and test costs compared to survival endpoints. In the proposed Master Thesis we will compare the performance and sensitivity to contaminants of 10 d sublethal sediment toxicity test with 10 d acute sediment toxicity test with the amphipod Corophium sp.	Dr. Maria Jesus Belzunce Segarra (jbelzunce@azti.es)	Marine Research Division; AZTI Foundation; Pasaia (Spain)	AZTI	<ul style="list-style-type: none"> — Graduated in Chemistry or Biology or Marine Sciences. — Good in laboratory and field work. — With initiative and open to scientific discussions, knowledge interchange and networking. — Knowledge of software and statistical programs
Impacts of maritime activities on natural capital and potential solutions: an application to coastal tourism	The Southern Eastern part of the Bay of Biscay supports an intensive level of diverse traditional (e.g. fisheries, aquaculture, tourism and maritime transportation) and emerging (e.g. renewable energies, etc.) activities. Substantial economic benefits are derived from these activities, which directly and indirectly depend on the natural capital (e.g. beaches, waves, benthic habitats). Nevertheless, the intensification of such activities can negatively affect the natural capital for current and future generation. One potential solution is to first assess the natural capital, both quantitatively and qualitatively, to integrate this valuation into management measures. Coastal tourism will be the focus of this thesis, in which the student will aim at i) Establish the links between the most relevant coastal activities and the natural capital with special emphasis on coastal tourism activities, ii) assess the impact of specific tourism activities on the natural capital, and iii) identify potential solutions to make the coastal tourism sustainable.	Arantza Murillas & Maria C. Uyarra	AZTI Tecnalia	N/A	'Interest on interdisciplinary research, with dominant knowledge on any of the following sciences : economy, ecology, sociology,...
High-latitude climate and Antarctic ice volume instability during the early Oligocene unipolar glaciated state: palaeoceanographic investigation of new drill cores from the	The predictions of coupled global climate-ice sheet models for the initiation of Antarctic glaciation across the Eocene-Oligocene transition (34 million years ago) are remarkably congruent with published palaeoclimate data sets from the deep ocean. Once formed, however, these models predict that a large Antarctic ice sheet should be stable because the high elevation of the ice sheet (>2 km) acts to limit top-down melting. In contrast, published geological records from the deep ocean show evidence for early to mid-Oligocene variability in the oxygen isotope composition of foraminiferal calcite (a proxy measure of high latitude temperature and continental ice volume). This discrepancy suggests that either our understanding of the history of change in atmospheric carbon dioxide (radiative forcing) is	Prof Paul A. Wilson & Dr Steven M. Bohaty	National Oceanography Centre Southampton, University of Southampton, Waterfront Campus, SO14 3ZH		ALIZEE LOPEZ

Newfoundland Margin	seriously flawed or that Oligocene ice sheets were more unstable than the models suggest. The published records for this time interval, however, are of insufficient resolution to capture the full amplitude and pacing of change. The student will tackle this problem by generating new foraminiferal stable isotope records from Integrated Ocean Drilling Program drill cores recovered on the Newfoundland margin which are characterized by unprecedented rates of sedimentation and exquisite preservation of calcareous microfossils (Prof Paul Wilson Co Chief Scientist http://iodp.tamu.edu/scienceops/expeditions/newfoundland_sediment_drifts.html).				
Physiological adjustments during conditioning to maintenance and optimal rations in species of clams: A comparative study of <i>Ruditapes decussatus</i> and <i>R. philippinarum</i>.		Enrique Navarro	Research Group on Physiological energetic of bivalve molluscs		
Time-course of enzymatic digestive acclimation in bivalves fed phytoplankton: a comparative study.	The digestive system of bivalves has shown to have an outstanding physiological plasticity. Rates of food acquisition, absorption efficiency, gut capacity and digestive enzyme activities are actively adjusted in these organisms to maximize food absorption under conditions of high quality food. Continuous phytoplankton feeding of intertidal bivalves promote a substrate unspecific induction of carbohydrases and proteases in the digestive gland which, in turn, brings about the possibility to increase rates of food acquisition and absorption, thus, improving food exploitation. The aim of this project is to analyze potential differences in the time-course and enzymatic mechanisms involved in the digestive response to continuous phytoplankton feeding between two species of bivalves: the blue mussel <i>Mytilus galloprovincialis</i> and the cockle <i>Cerastoderma edule</i> .	Irrintzi Ibarrola irrintzi.ibarrola@ehu.es	Research Group Physiological energetics of marine bivalves, Department of genetic, Physical Anthropology and Animal Physiology. Faculty of science and Technology. University of the basque Country/ Euskal herriko Unibertsitatea.		
Importance of metamorphosis in larval settlement of coral reef fish.	Nearly all coral reef fishes show a dual life history where demersal and sedentary adults produce dispersive larvae, which are encountered in the open ocean. This pelagic larval stage occurs after hatching and, during that time, individuals are subject to dispersal, thanks to currents and larval swimming abilities. After a rapid development and growth, larvae reach a developmental stage called 'competence'. Once competent, usually near the end of the pelagic phase, larvae are ready to leave the open ocean and join the demersal reef populations. This arrival at the immediate vicinity of reefs involves species-specific perception and selection of environmental cues such as reef odours (chemical cues), reef noises (acoustic cues) and sun compass (visual cues). The transition between the pelagic and the demersal stages corresponds to settlement. It usually occurs at night, when the visual predation within the reef is lower. In parallel to this ecological transition, coral reef fishes often lose many of their planktonic characteristics and develop other features adapted to the new demersal environment. Indeed, after reaching competency, coral reef fish larvae usually encounter a key and major species-specific period of adaptive changes. Nearly all studies have only focused on morphological transformations (e.g. morphometrical remodelling, fin	David Leccini Marc Besson (CRIOBE, Moorea) leccini@univ-perp.fr	Univ-Perpignan		ISADORA MONIZ

	<p>spine shortening, pigmentation and skeletal development), while almost data is available on the physiology of such processes. Whether or not these changes coincide precisely with settlement, they are, in most species, very rapid. For instance, the pigmentation of the transparent <i>Acanthurus triostegus</i> larva can occur within 2 hours after entering the reef. Overall, the development of a coral reef fish larva into a juvenile, which occur at or around settlement, after reaching developmental competency and under (currently unknown) environmental signals, involves rapid post-embryonic morphological, behavioural, physiological and ecological changes. This is why this transition is called a 'metamorphosis', as classically defined in the literature. In this context, this project is the first to tackle coral reef fish metamorphosis in regard to its physiology, through the study of the thyroid hormone pathway and its importance in the development of sensory organs. The main objectives of this project are to characterize: (i) how much do thyroid hormones control coral reef fish metamorphosis, (ii) how important is this metamorphosis in coral reef fish larval recruitment (in regard to the development of sensory organs) and (iii) how climate change (global warming and ocean acidification in particular) and water pollutions (pesticides) are affecting metamorphic processes and larval recruitment success.</p>				
<p>Microzooplankton changes in the estuary of Bilbao during 1994-2012: effect of climate and anthropogenic factors</p>	<p>Using zooplanktonic and environmental time-series of the highly humanised estuary of Bilbao and multifactorial methods will be analysed the long-term effect of climate and water quality on microzooplankton structure and dynamics</p>	<p>Fernando Villate fernando.villate@ehu.es</p>	<p>Lab. of zooplankton ecology. Dept. of Plant Biology and Ecology, Faculty of Science and Technology, UPV/EHU, Leioa</p>		
<p>Chlorophyll a concentration in the estuary of Bilbao during 1998-2012: effect of sewage pollution abatement and climate</p>	<p>Using raw and deseasonalized time-series, the relationship of an eutrophication indicator, such as chlorophyll a concentration, with hydro-climatic factors (temperature, river flow, stratification) and sewage pollution indicators (e.g. ammonium) will be analyzed using correlation and regression analysis.</p>	<p>Arantza Iriarte arantza.iriarte@ehu.es</p>	<p>Lab. of zooplankton ecology. Dept. of Plant Biology and Ecology, Faculty of Science and Technology, UPV/EHU, Leioa</p>		
<p>Distribution of the microzooplankton at different spatio-temporal scales in the northwestern Mediterranean</p>	<p>The knowledge of the patterns of abundance and distribution of zooplankton is essential to understand the functioning of marine ecosystems. In this work, the distribution of microzooplankton at different spatio-temporal scales in the Mediterranean during June and November 2005 in relation to environmental features will be analysed.</p>	<p>Ibon Uriarte ibon.uriarte@ehu.es</p>	<p>Lab. of zooplankton ecology. Dept. of Plant Biology and Ecology, Faculty of Science and Technology, UPV/EHU, Leioa</p>		
<p>Deciphering cell proliferation in mussels: Is tissue regeneration and turnover after starvation enhanced by DC electrical</p>	<p>The marine mussel <i>Mytilus galloprovincialis</i> is a species of major commercial importance in aquaculture. Plus, it is also widely used taxa for ecotoxicological assessment. Mussels are able to adapt to food deprivation stress and survive for long periods of time and readapt to favorable conditions upon stress cessation. Nonetheless, the histological and cellular mechanisms underlying this stress recovery remain largely unrevealed. Marigomez et al. (1999) and Zaldibar et al. (2004, 2008) were first to detect proliferative activity in digestive gland of <i>M. galloprovincialis</i>, however, the origin and aetiology of stem cells remains elusive.</p>	<p>Manu Soto manu.soto@ehu.eus Endika Gil Uriarte endika.gilu@ehu.eus</p>	<p>Cell Biology in Environmental Toxicology (CBET) Research Group, Plentzia Marine Station, UPV/EHU.</p>	<p>BMW research project, consolidated research group CBET, unit of</p>	<p>Lovina Fullgrave</p>

stimulation? The histological and cellular plasticity of stress recovery	In short, the aim is to investigate the role of the application of DC currents to elucidate whether proliferative activity, tissue recovery rate and overall health condition is enhanced in previously stressed mussels. Findings may give insight to histological plasticity of mussels, influences of food input upon histological/cellular biomarkers and highlight potential implications of DC current electrostimulation for tissue regeneration and turnover. Key words: DC current, Cell proliferation, stress recovery, tissue regeneration, electrostimulation.			formation and research Ecosystem Health Protection	
Projects proposed by Michel Kulbicki from the ACOR institution (French initiative for coral reefs)	<ol style="list-style-type: none"> 1) Gestion participative de bassins versant. Le cas de la presqu'île de Tahiti (Participative management in rain basins : case of Tahiti) 2) Les îles sentinelles de Polynésie française (Sentinel islands in French Polynesia) 3) Améliorer la résistance des jeunes stades de vie aux changements climatiques: utopie ou réalité? (Give a better chance toward climatic changes to early life cycles: utopy or reality ?) 4) Metamorphosis and larval recruitment of the coral reef fish <i>Platax orbicularis</i> Replenishment Tetiaroa's lagoon through the capture, culture and restocking of fish post-larvae 5) Restocking of fish and crustacean post-larvae at Tetiaroa Atoll 6) Effects of stress on the metamorphosis and larval recruitment of coral reef fish caused by seawater acidification 7) Les récifs coralliens dans des environnements à haute et basse énergie (High and low energy environments in coral reefs) 8) Nutrient cycling and the functioning of coral reefs (French Polynesia) 	projects themes at CRIOBE in Moorea. For more details contact Michel: michel.kulbicki@ird.fr	CRIOBE, Moorea		
Effects of acidification on mussel gamete viability	The present work aims to study the effects of acidification on mussel gamete development and viability. It is known that acid environments can disrupt fertilization and embryo development in shellfish such as sea urchins. Mussels, used worldwide as sentinel organisms of marine ecosystem health, offer a good opportunity to study acidification processes, as recently found to be sensitive to high pCO ₂ . Transcriptome level changes have been reported in mussels subjected to acidic environment and poor adhesion strength to substrates. Together with assessing gamete development and quality, core health status biomarkers will be studied to evaluate adult stress after exposure to acidic environment. This work offers the opportunity on learning on fertility and fecundity techniques together with introducing the student on the evaluation of changes in the environment to marine organisms.	Urtzi Izagirre (urtzi.izagirre@ehu.es) and Maren Ortiz-Zarragoitia (maren.ortiz@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, Plentzia Marine Station, UPV/EHU.	BMW research project, consolidated research group CBET, unit of formation and research Ecosystem Health Protection	interest in Cell Biology and animal physiology.
Characterization of vertebrate-like neuropeptide and amine hormones in mussels (<i>Mytilus galloprovincialis</i>).	Bivalves is one of the largest taxonomic groups among animals but their endocrine system is poorly understood. Molecules controlling gametogenesis have not been completely characterized and thus, an effort should be done in order to elucidate the mechanism controlling reproduction in this important animal group. Steroids have been isolated from bivalve tissues but recent works propose that they do not directly participate in the regulation of gametogenesis in mollusks and a potential involvement of peptide hormones has been suggested. The aim of this work is to assess the transcription levels of vertebrate-like gonadotropin-releasing hormone (GnRH) in mussel gonad tissue at different stages of the reproductive cycle. Furthermore, other non-peptide neurotransmitters such as serotonin and dopamine will be also evaluated as potential communication molecules participating in the	Maren Ortiz-Zarragoitia (maren.ortiz@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, Plentzia Marine Station, UPV/EHU.	Consolidated research group CBET, unit of formation and research Ecosystem Health Protection	interest in Cell Biology.

	control of gametogenesis in mussels.				
Assessment of the effects of obesogenic contaminants in fish liver explants	Several contaminants can disrupt the metabolism of lipids in exposed organisms. Those contaminants are known as obesogens and constitutes a new family of compounds which incidence in the environment is growing. In vitro methods based on cell cultures offer the possibility of testing several chemicals and mixtures in a short period of time. However, traditional cell cultures rely in a single cell type composition, thus limiting the integrative response that occurs in organs. Alternative to traditional cell culture experiments are those based on tissue explants. Cells are not disaggregated from neighbouring cells and fibres and retain the same structure found in organs. This work aims to test the effects of selected obesogenic contaminants (selection based on bibliography search), individually or in mixtures, using fish liver explants as experimental model. Recent works using this strategy have demonstrated the usefulness of the methodology and results are more integrative at organ level. Endpoints will include cell viability and cytotoxicity, together with transcription levels of key genes participating in lipid metabolism.	Maren Ortiz-Zarragoitia (maren.ortiz@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, Plentzia Marine Station, UPV/EHU.	Consolidated research group CBET, unit of formation and research Ecosystem Health Protection	interest in Cell Biology.
Effects of endocrine disruptor mixtures in fish.	Endocrine disruptors constitute a wide group of contaminants that can interact with the endocrine system of vertebrates. Their effects can modulate the differentiation, development and reproduction of exposed organisms. Aquatic environments are the final sink of several endocrine disruption, thus, aquatic organisms are continuously exposed to them. Traditional toxicology studies have focused in single exposure scenarios in order to understand toxic mechanisms provoked by contaminants. However, wild organisms are exposed to complex contaminant mixtures with unpredictable effects. This project aims to assess the effects of a complex mixture of endocrine disruptors, mimicking the composition of a sewage water treatment plant effluent, in exposed juvenile sea bass. Samples of brain, liver and gills will be studied and transcription levels of target genes quantified. Responses at multi-tissue level will be integrated in order to decipher molecular mechanisms regulated by contaminant mixture.	Maren Ortiz-Zarragoitia (maren.ortiz@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, Plentzia Marine Station, UPV/EHU.	Consolidated research group CBET, unit of formation and research Ecosystem Health Protection	interest in Cell Biology. Matteo Barbato
Characterization of xenoestrogenicity in commercial fish species of Bay of Biscay	Xenoestrogens are pollutants that mimic the effects of natural estrogens, and thus disrupt the differentiation and reproduction of exposed organisms. Their presence in the aquatic environment is well known, feminizing impacted fish populations. Presence of intersex males together with molecular markers of feminization have been observed in estuarine and marine species. This project aims to assess the exposure to xenoestrogens of commercial fish species collected in the Bay of Biscay. For this purpose, transcription levels of vitellogenin will be determined by real time qPCR in fish liver samples. Vitellogenin, precursor of egg-yolk proteins, is a well marker of xenoestrogenicity and actually included in several international monitoring programmes. Student will obtain sequences for vitellogenin transcript in different marine species and then assess transcription levels in male or juvenile organisms.	Maren Ortiz-Zarragoitia (maren.ortiz@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, Plentzia Marine Station, UPV/EHU.	Consolidated research group CBET, unit of formation and research Ecosystem Health Protection	interest in Cell Biology.
Application of the computer program SHAPE (quantitative evaluation of biological shapes based on elliptic	The Olividae gastropods, and especially within the genus <i>Oliva</i> , is known for the huge variability of their shells (adult size, colors, shapes, ...). This constitutes a big taxonomic problem known as the "Oliva species problem". According to authors, the number of "good" (valid) species varies from 41 (Tryon) to ... 176 (Petuch & Sargent). Moreover lots of "variants", "forms", ... were added. In order to get rid of subjective points of view, we propose to quantify the shape of shells through a software based	Mathieu Poulicek mpoulicek@ulq.ac.be	Marine Ecology unit, Lab. écologie animale & écotoxicologie, Dept Biologie-écologie-évolution, Liège university		

<p>Fourier descriptors) to the gastropod "Oliva" shells species problem.</p>		<p>on elliptic Fourier descriptors, analyze the results through principal components and cluster analysis and so try to isolate the best parameters describing intra- and inter-specific variation, validity of sub-generic definitions, ... We will use type specimens pictures from several museums and specimens covering the known variation from museum and private collections. Methods: Biometrical approach, picture analysis, software application, statistics.</p>				
<p>Toxicity of selected emerging pollutants in survival, fecundity and hatching success disruption.</p>	<p>Emerging pollutants are defined as microcontaminants without established regulation and/or well studied effects to biota. They included several chemicals that can interact with living organisms and negatively impact their fitness, reproduction, development and survival, thus altering population dynamics. This project aims to investigate toxic effects of selected emerging pollutants (i.e, glyphosate pesticide, nonylphenol, etc.) in copepods, assessing the survival, fecundity and hatching success as endpoints. Copepods are key invertebrate species in the marine and estuary zooplankton communities and the alteration in population structure and dynamic could compromise estuary health status. The work will form the student in the collection and identification of copepods from field samples, design a laboratory experiment for toxicological studies and integrate the results in more holistic perspective for environmental health status management.</p>	<p>Fernando Villate (fernando.villate@ehu.eus) and Maren Ortiz-Zarragoitia (maren.ortiz@ehu.eus)</p>	<p>Plentzia Marine Station, UPV/EHU.</p>	<p>Consolidated research group CBET and Unit of Formation and Research Ecosystem Health Protection</p>	<p>interest in Marine Ecology, Marine Biology and Environmental toxicity.</p>	
<p>Effects of microplastics and associated contaminants in marine mussels</p>	<p>Plastic debris in the marine environment is an issue of increasing concern due to the effects that plastics can have on the biota. Furthermore, plastics contain chemical additives, such as phthalates and bisphenol A known to cause estrogenic effects in animals, and can also adsorb persistent organic pollutant from the water column acting as carriers for the organisms. This project will be develop in the framework of a big European project with partners from all around Europe and will explore the effects produced by micro- and nano-plastics and associated contaminants in marine mussels, as key species of the marine and estuarine food web.</p>	<p>Amaia Orbea (amaia.orbea@ehu.es)</p>	<p>Cell Biology in Environmental Toxicology» Research Group. PIE-UPV/EHU</p>	<p>JPI Oceans call, MINECO</p>	<p>Preferable Degree in Biosciences (but not compulsory) Rebecca Von Hellefeld</p>	
<p>Linking Biodiversity and ecosystem services using a trait</p>	<p>Marine organisms provide a wealth of services to humans. The Millennium Assessment report classified these services among different categories which are "Provisioning services" (Products obtained from ecosystems, e.g. food, medical resources, biotechnology resources,</p>	<p>Marilaure Grégoire (mgregoire@ulg.ac.be)</p>	<p>MARE Centre (Laboratory of Oceanology), University of Liege, Belgium</p>	<p>No</p>		

based approach	<p>energy), "Regulating services" (Benefits obtained from regulation of ecosystem processes, e.g. climate regulation, organic waste processing), "Cultural services" (Nonmaterial benefits obtained from ecosystems e.g. recreation, culture, tourism), and "Supporting Services" (Support services: Services necessary for the production of all other services, e.g. Primary production, Oxygen production, Nutrient Cycling). Using existing collected data on macrobenthos biomass and abundance (Calvi bay and Black sea), the aim of the master thesis consists in assessing the services delivered by the benthic ecosystem through a biological trait analysis of its species. The traits will be selected to be linked with the investigated services. Once the different traits are determined for each dominant species of the investigated communities, statistical analysis will be performed in order to assess the functional diversity of each community and between communities. The diversity between sites will be explained in terms of variability of environmental variables (e.g. substrate composition, organic matter content and composition). Correlations between the different types of traits (e.g. traits related to different processes, sensitive traits and traits related to ecosystem services) will also be determined. Communities including species with traits that are important for the delivering of ecosystem services to humans will be identified and compared with regions of high diversity.</p>				
TRANSsferts of microPOLutants from sand to the trophic food chains in the MEDiterranean coastal areas. TransPolMed	<p>All pollutant inputs in the environment are finally discharged in the oceans and accumulated into the sediment (colonized by particular fauna and flora, starting point of trophic food webs) This project aims to estimate the transfer of micropollutants from the sediment towards species of different trophic levels as the sea cucumber (soft bottom feeder), a sea urchin (grazer), the red mullet and the red scorpion fish (first and second-class carnivorous).</p>	<p>Sylvie GOBERT Sylvie.gobert@ulg.ac.be</p>	<p>MARE Centre (Laboratory of Oceanology), University of Liege, Belgium</p>	<p>No</p>	<p>Dhiman Gain</p>
Patchiness Posidonia oceanica effect, from plant to community level.	<p>The Msc thesis will be focused on the difference between the continuous meadow and the edges of the Posidonia patches. The student will carry on Diving-PAM measurements (mid-meadow and edges), samplings for biometry and epiphyte community, vagil fauna samplings and finally fish counting. Structural observations will be carried out using already available data from STARESO. Research applications: in fundamental research mainly ecology, plant physiology and biodiversity. In management due to seascape patchiness studies. Acquirement of skills on diving-pam (developing tool).</p>	<p>Sylvie GOBERT Sylvie.gobert@ulg.ac.be</p>	<p>MARE Centre (Laboratory of Oceanology), University of Liege, Belgium Liege/ STARESO:</p>		<p>Jon Lapeyra</p>
Topics related with coastal engineering, wave energy, global warming impact.... <i>(consult Manu for availability of projects)</i>		<p>Iñigo Losada losadai@unican.es http://www.ihcantabria.com/</p>	<p>Instituto de Hidráulica Ambiental de la Universidad de Cantabria. Santander</p>		
Long-term evolution of the South Bay of Biscay ecosystem in response to climatic and anthropogenic forcing	<p>Fisherman from coastal waters of South Bay of Biscay noticed for several years now the occurrence of marine pelagic mucilages clogging occasionally their fishing nets. Locally called "Liga", those mucilages develop by the end of winter / beginning of spring as well as by late summer / early fall. Since the beginning of the 2000's, this phenomenon seems to be accentuated and to endure over seasons. Similar phenomenon is known in Adriatic for decades now and the literature shows that those events are extending in adjacent areas and their frequency increasing. If in the Mediterranean this phenomenon is well known, there is still little or no documented evidence of such events in the Atlantic.</p>	<p>Susperregui, Nicolas ima.susperregui@wanadoo.fr</p> <p>Del Amo, Yolanda. y.delamo@epoc.u-bordeaux1.fr</p> <p>David, Valérie: v.david@epoc.u-bordeaux1.fr</p>	<p>Institut Milieux Aquatiques, Bayonne.</p> <p>UMR CNRS EPOC, Station Marine d'Arcachon.</p> <p>UMR CNRS EPOC, Station Marine d'Arcachon.</p>	<p>PhD continuation ? NO</p>	

	<p>Indeed, it is known that a number of biological and physical processes contribute to the production and to the accumulation of marine colloidal material : exopolysaccharide production by some planktonic microorganisms and under specific environmental conditions, natural (cell cycle) or under stress (limitation, viral lysis...), mechanical aggregation, flocculation, species selection and trophic cascades.</p> <p>In order to better define the processes that are involved in its formation and to understand the reasons of its increasing occurrence, it seems necessary to better discern the ecosystem evolution during the last decades. Previous studies have evidenced the influence of climatic forcing (warming, decreasing river runoff...) and / or anthropogenic (nutrient inputs) impacts on biological communities (plankton, fish...) in coastal waters. Planktonic organisms have a short life cycle and therefore rapidly respond to environmental modifications; mostly by threshold effect (modification of temperature or hydrodynamics) some species are favored at the expense of others depending on their ecological niche. In some years, the whole biological communities are deeply modified. Such modifications have recently been evidenced in adjacent ecosystems : North Sea (Beaugrand 2003), Gironde estuary (Chaalali et al. 2013)...</p> <p>Within this context, the main objective of the project is to define the evolution of biological compartments in relation to climatic and anthropogenic forcing in the south Bay of Biscay where Liga events have been documented. The research aims 1) to collect of available databases to answer the above question: climatic indexes at the North Atlantic scale (AMO, NAO...), local climate (temperature, precipitations...), hydrology (salinity, nutrient inputs...), biology (phytoplankton, zooplankton, fish..) collected by different structures that have monitoring services (Météo-France, Universities, INSU, Ifremer, engineering consultants offices...), and 2) to set up a statistical analysis strategy adapted to our data (temporal and spatial consistency with data acquisition).</p> <p>Beaugrand, G. 2003. The North Sea regimeshift: Evidence, causes, mechanisms and consequences. Progress In Oceanography 60:246-262.</p> <p>Chaalali, A., G. Beaugrand, P. Boët, and B. Sautour. 2013. A Climate-caused abrupt shifts in a european macrotidal estuary. Estuaries and Coasts 36:1193-1205.</p> <p>Keywords : marine mucilage, climatic forcing, pelagic biological compartments</p>				
<p>Vers une assimilation des données paléoclimatiques du dernier millénaire dans un modèle complexe de climat utilisé par le GIEC.</p>	<p>Les variations naturelles du climat ont jouées un rôle important à l'échelle pluri-décennale et vont continuer à influencer le climat à venir. Ainsi, le ralentissement du réchauffement du climat global observé au cours des 15 dernières années communément appelé « hiatus », illustre parfaitement le rôle clef que peuvent jouer les variations internes du climat, organisées autour de grands modes dynamiques. Les observations instrumentales ne remontent qu'au début de l'ère industrielle (~1850), si bien que la compréhension de la variabilité décennale à pluri-centennale nécessite le recours à des enregistrements du climat plus indirects, issus par exemple de l'analyse de cernes d'arbres ou de sédiments marins et lacustres. Le dernier millénaire constitue un cadre privilégié en ce sens. Cependant, la couverture spatiale de ces données reste faible, si bien que l'utilisation d'un modèle de climat associée à une méthode d'assimilation de ces données représente une amélioration clef pour notre compréhension du climat. En effet, l'assimilation des températures de surface océaniques observées au cours des 50 dernières années dans le modèle de climat de l'IPSL a déjà démontré son utilité pour</p>	<p>Encadrants : Didier Swingedouw et Myriam Khodri</p> <p>Lieu principal du stage : Laboratoire EPOC / Université de Bordeaux</p>		<p>Possibilité de poursuite en thèse : Oui, financement à obtenir auprès de l'école doctorale de Bordeaux. Rémunération : Oui (projet ANR MORDICUS,</p>	

	<p>la compréhension des variations du climat récentes. Ce stage propose d'étendre cette approche au climat des siècles passés. Le modèle utilisé sera IPSL-CM6-VLR, un modèle de circulation globale couplé océan-atmosphère. La technique proposée s'appuiera sur une méthode simple de rappel vers la température de surface océanique, telle que reconstruite récemment pour le dernier millénaire par Mann et al. (2009). Cette méthode d'assimilation a déjà été utilisée avec succès pour les 50 dernières années (Swingedouw et al. 2013). Le défi sera ici de l'appliquer pour des périodes de temps plus lointaines.</p> <p>La reconstruction de Mann et al. (2009) présente une résolution spatiale de l'ordre de la centaine de kilomètre réalisée à l'aide d'extrapolation de reconstructions paléo-climatiques principalement continentales et d'analyses en composantes principales reliant surface terrestre et océan. Une nouvelle compilation a vu le jour dans le cadre du projet internationale PAGES 2K. Le stage s'attachera à évaluer la reconstruction de Mann et al. (2009) par rapport à ces nouvelles compilations régionales (cf. PAGES2K 2013). On évaluera en particulier si il existe des périodes privilégiées où l'accord entre les reconstructions est important. A partir de cette évaluation, on proposera une première simulation test de la méthode d'assimilation de données avec un rappel en température de surface. Cette simulation sera ensuite analysée en regard de reconstructions indépendantes. Enfin, des améliorations pourront être testées, avec notamment la méthode dite de « pattern nudging » qui permettra d'intégrer de nouvelles reconstructions de l'oscillation nord Atlantique et de l'oscillation Australe au sein du processus d'assimilation.</p> <p>Cette étude devrait permettre de mieux comprendre les variations climatiques naturelles au cours du dernier millénaire, et notamment les variations de la circulation océanique de retournement en Atlantique Nord, qui joue un rôle clef pour le climat.</p> <p>Références :</p> <p>Mann, M. E. et al. Global signatures and dynamical origins of the Little Ice Age and Medieval Climate Anomaly. <i>Science</i> 326, 1256–60 (2009). PAGES 2k Consortium. Continental-scale temperature variability during the past two millennia. <i>Nat. Geosci.</i> 6, 339–346 (2013). Swingedouw, D., Mignot, J., Labetoulle, S., Guilyardi, E. & Madec, G. Initialisation and predictability of the AMOC over the last 50 years in a climate model. <i>Clim. Dyn.</i> 40, 2381–2399 (2013).</p>			<p>environ 500 euros mensuels)</p>	
<p>Analysis of humpback whale vocalisations</p>	<p>Analysis of Humpback Whale Vocalisations This project will examine existing acoustic data, collected from Humpback whales (<i>Megaptera novaeangliae</i>) close to the island of St Merie (Madagascar). The objective of the work will be to identifying vocal features that relate to the sound production mechanism. These data will be analysed using standard speech processing methods, for example using software such as PRAAT (http://www.fon.hum.uva.nl/praat/). It is believed that the sound production within baleen whales share much in common with that of other mammal species (although there are also some key distinguishing features). By analysing whale vocalisations using methods developed for human speech it will be possible to identify properties which provide insights into the sound production mechanism and even potentially allow one to identify individual whales from the features of their specific vocal characteristics.</p>	<p>Professor Paul White</p>	<p>Institute of Sound and Vibration Research. Building 13, room 2031, M9 Engineering and the Environment. University of Southampton Highfield. Southampton SO17 1BJ, UK</p>		<p>Juliette Damien</p>
<p>TOPICS RELATED WITH MARINE</p>	<p>If someone has interest in developing a project related with Marine Microbiology, please contact with Ikerbasque Professor Vladimir Kaberdin</p>	<p>Prof. Vladimir Kaberdin vladimir.kaberdin@ehu.eus</p>	<p>University of the Basque Country. Department of</p>		

MICROBIOLOGY			Immunology, Microbiology and parasitology		
Determination of the mixing regime of waters in estuaries from the Biscay coast		Luis A. Fernández luis-angel.fernandez@ehu.eus	IBeA, Faculty of Science and Technology		Oceanographers Physicists. experience in transport models
Stage de Master 2 en télédétection des zones côtières	<p>Méditerranée, Golfe du Lion) à partir de dix ans d'observations satellitaires « couleur de l'eau ».</p> <p>La télédétection "couleur de l'océan" renseigne sur les concentrations en matières en suspension (MES) de surface (Doxaran et al., 2015 ; Lorthiois et al. 2012) et permet d'étudier érosion des sols, morphologie des côtes, dynamique sédimentaire et transport de polluants d'origine anthropique. Les eaux côtières du Golfe de Lion sont soumises à l'expulsion d'un panache fluvial au niveau du Rhône. Depuis 13 ans, (2003-2015), le capteur satellitaire MODIS (Moderate Resolution Imaging Spectroradiometer) enregistre chaque jour la couleur des eaux du panache du Rhône avec une résolution spatiale de 250 m (http://oceancolor.gsfc.nasa.gov/). Des études récentes (Lorthiois et al. 2012) ont montré que ces données satellitaires permettent d'y cartographier les concentrations en matières en suspension et ainsi d'assurer un suivi de leur dynamique spatio-temporelle.</p> <p>L'objectif principal du stage sera de traiter les mesures satellitaires MODIS archivées (2003 – présent) avec un algorithme régional afin de cartographier les concentrations en particules en suspension dans le panache turbide du Rhône, puis d'analyser la dynamique spatio-temporelle de ces particules en suspension en fonction des forçages physiques en jeu (débit fluvial, vents et circulation régionale). Il s'agira de télécharger les données satellitaires (mesures radiométriques au sommet de l'atmosphère) depuis le site de la NASA, puis générer des cartes de concentrations en matières en suspension (composites journaliers à mensuels) avant d'analyser les tendances saisonnière à multi-annuelle observées.</p> <p>Le candidat retenu travaillera au Laboratoire d'Océanographie de Villefranche (UMR 7093 CNRS-UPMC) au sein de l'équipe OMTAB (Optique Marine et Télédétection, Applications biogéochimiques). Les candidatures sont à adresser à Dr. D. Doxaran (doxaran@obs-vlfr.fr). La date limite du dépôt de candidature est le 15 novembre 2015. Les candidats seront informés mi-décembre. Le stage débutera en février 2015. A l'issue du stage, le candidat retenu aura la possibilité de postuler à une bourse de thèse GIS-COOC (www.gis-cooc.org). La motivation et l'aptitude du candidat à poursuivre en thèse (sous réserve d'obtention de financement) sont des critères importants de sélection pour ce stage de M2.</p> <p>Références bibliographiques et liens utiles</p> <p>Doxaran, D., Devred E. and M. Babin (2015). A 50% increase in the amount of terrestrial particles delivered by the Mackenzie River into the Beaufort Sea (Canadian Arctic Ocean) over the last 10 years. <i>Biogeosciences</i>, 12, 3551–3565.</p> <p>Lorthiois T., D. Doxaran and M. Chami (2012), Daily and seasonal dynamics of suspended particles in the Rhône River plume based on remote sensing and field optical measurements. <i>Geo-Marine Letters</i>, DOI: 10.1007/s00367-012-0274-2.</p> <p>http://www.highroc.eu/ http://www.lov.obs-vlfr.fr/fr/presentation_generale/les_equipes_de_recherche/equipe_omtab.html http://www.ioccg.org/</p>	Contact: David Doxaran" <doxaran@obs-vlfr.fr	U. Laval, Québec, Canada		The travel to Canada(Quebec, round trip and 2600€ remuneration for 6 months will be paid by the proposers).
Master 2 'Ocean colour remote sensing of coastal waters'	As part of the HIGHROC (« HIGH spatial and temporal Resolution Ocean Colour products and services ») and MATUGLI (« Autonomous measurements of water turbidity onboard GLiders ») research projects, funded by European Commission and the French Agence Nationale de la Recherche, we propose a Master-2 training period in ocean colour remote sensing. The objectives will be to map and study the	Contact: David Doxaran" <doxaran@obs-vlfr.fr	U. Laval, Québec, Canada		The travel to Canada(Quebec, round trip and 2600€ remuneration for 6

	<p>dynamics of suspended particles in the Rhône River plume (NW Mediterranean Sea) using 10 years of high spatial resolution ocean colour satellite data.</p> <p>Ocean colour satellite data can be used to estimate the concentration of suspended particles within surface waters in coastal zones (Lorthiois et al. 2012, Doxaran et al. 2015), in relation with key environmental processes such as land erosion, morphology of estuaries and coasts, sediment dynamics and transport of pollutants from the land to the ocean. This is particularly true in the Gulf of Lion which receives the discharge of the Rhône River. Over the last 13 years (2003-2015), the MODIS (Moderate Resolution Imaging Spectroradiometer) ocean colour satellite sensor has recorded daily measurements over the turbid plume of the Rhône River at the high spatial resolution of 250 m (http://oceancolor.gsfc.nasa.gov/). As part of a recent study (Lorthiois et al. 2012), a regional algorithm has been developed to estimate and map concentrations of suspended particles in the Rhône River plume.</p> <p>The main objectives of the proposed research work will to process the archived MODIS high resolution satellite data (2003 – present) using this regional algorithm to map the concentration of suspended solids then analyze its spatial and temporal dynamics and detect any significant multi-year trend. For that the selected candidate will download the archived satellite data from the NASA website (measurements at the top of the atmosphere), apply the regional algorithm to correct data for atmospheric effects and estimate the concentration of suspended particles, then produce daily, weekly and monthly composites. The observed spatio-temporal dynamics of suspended particles will be related to the main physical forcings (river discharge, winds and regional circulation).</p> <p>The selected candidate will work in the Marine Optics research group (OMTAB) of the Laboratoire d'Océanographie de Villefranche (UMR 7093 CNRS-UPMC). Applications must be sent to Dr. D. Doxaran (doxaran@obs-vlfr.fr) no later than 15 November 2015 and the training period will start in January 2015. The opportunity will be given to apply for a PhD grant funded by the GIS-COOC (www.gis-cooc.org).</p> <p>References and web links Doxaran, D., Devred E. and M. Babin (2015). A 50% increase in the amount of terrestrial particles delivered by the Mackenzie River into the Beaufort Sea (Canadian Arctic Ocean) over the last 10 years. <i>Biogeosciences</i>, 12, 3551–3565. Lorthiois T., D. Doxaran and M. Chami (2012), Daily and seasonal dynamics of suspended particles in the Rhône River plume based on remote sensing and field optical measurements. <i>Geo-Marine Letters</i>, DOI: 10.1007/s00367-012-0274-2. http://www.highroc.eu/ http://www.lov.obs-vlfr.fr/fr/presentation_generale/les_equipes_de_recherche/equipe_omtab.html http://www.ioccg.org/</p>	<p>David DOXARAN Observatoire Océanologique Laboratoire d'Océanographie de Villefranche UMR 7093 - CNRS / UPMC 181 chemin du Lazaret 06230 Villefranche-sur-Mer</p>		<p>months will be paid by the proposers).</p>
<p>Morphological characterization of the denticles of mako shark for the design of hydrodynamic surfaces</p>	<p>The Mako shark (<i>Isurus oxyrinchus</i>) located in the Bay of Biscay, has a particular skin structure consisting of dermal denticles –small, tooth-like scales. Morphologically the denticles have evolved to make the shark extremely hydrodynamic; it is in fact one of the quickest species of shark in the world. Ideally, these microscopic denticles can be mimicked for use as covers on boat hulls, or other hydro and aerodynamic structures, thereby increasing their performance and fuel efficiency.</p>	<p>Manu Soto Jesus Mari Blanco</p>	<p>PIE-UPV/EHU EUITI Bilbao</p>	<p>Patriicia Fernandez-Waid</p>
<p>Uptake and toxicity of nanoplastics compared to microplastics in the marine environment.</p>	<p>This master thesis is part of an EU funded project (PLASTOX) aiming to understand the ecotoxicological impact of nano and microplastics in combination with persistent organic pollutants (POPs) on key European marine species and food webs. Specifically, the master thesis will investigate nano and microplastic uptake and toxicity in vitro using cultures of hemocytes, immune cells of mussels. Due to their filter-feeding activity and well-developed endo-lysosomal system, mussels have been considered an important target for nano and microplastic toxicity in the marine environment. Several cytotoxicity and functional in vitro tests well established in the laboratory will be applied using nano and microplastics of different sizes and physicochemical characteristics, in combination with relevant POPs. The study will allow to characterize nano and microplastic uptake and accumulation at the cellular level and to determine their mode of action, as well as the role of POPs adsorption on their toxicity.</p>	<p>Miren P. Cajaraville (miren.p.cajaraville@ehu.es)</p>	<p>Cell Biology in Environmental Toxicology (CBET) Research Group, UPV/EHU, Leioa and Plentzia</p>	<p>EU PLASTOX research project, consolidated research group CBET, unit of formation and research Ecosystem Health</p>

				Protection	
Effects of dietary exposure to Ag nanoparticles on mussels <i>Mytilus galloprovincialis</i>: oxidative stress and histopathology	This master thesis is part of the ongoing research project Nanosilveromics, funded by the Spanish Ministry, which aims to gain deeper knowledge on the mechanisms of action and toxicity of Ag nanoparticles (NPs) to aquatic organisms at environmentally relevant Ag NP concentrations. For this, the model bivalve species <i>Mytilus galloprovincialis</i> has been exposed to Ag NPs through the diet (contaminated algae) for 21 days in two different seasons (autumn and spring), to compare the responses of mussels at different seasons and reproductive stages. The master student will determine potential effects on oxidative stress (activities of antioxidant enzymes) and at histological level in paraffin embedded sections, specially focusing on histopathological alterations in the digestive gland and gonad tissue. Results obtained will suppose a step forward in environmental risk assessment of Ag NPs.	Miren P. Cajaraville (mirenp.cajaraville@ehu.es) and Eider Bilbao (eider.bilbao@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, UPV/EHU, Leioa and Plentzia	Nanosilveromics research project, consolidated research group CBET, unit of formation and research Ecosystem Health Protection	
Development of an <i>in vitro</i> assay using mussel gonad explants for contaminant toxicity testing.	This work aims to establish a protocol for obtention and maintenance of mussel gonad explants for its application in toxicological studies. Mussels are used worldwide as sentinels of marine pollution but few <i>in vitro</i> assay protocols exist, out of those based on hemocytes and gill cells. We propose the adaptation of protocols established with fish tissue explants to mussel mantle/gonad tissue as a promising tool for ecotoxicological studies. This will offer the possibility of testing several contaminants in rapid <i>in vitro</i> assays and of understanding potential mechanisms altered by novel pollutants such as nanomaterials and microplastics in combination with persistent organic pollutants (POPs) in mussel gonad cells. At a first step mussel gonad explants will be maintained in different culture conditions and for different times to assess explants viability. Endpoints will include cell viability assays such as neutral red retention time, MTT assay and LDH release assay. In parallel, an histological description of explants tissue structure will be performed.	Maren Ortiz-Zarragoitia (maren.ortiz@ehu.es), Miren P. Cajaraville (mirenp.cajaraville@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, Plentzia Marine Station, UPV/EHU.	EU PLASTOX research project, Consolidated research group CBET, unit of formation and research Ecosystem Health Protection	
Sequencing of vitellogenin gene in mussel <i>Mytilus galloprovincialis</i> and seasonal variations in transcription levels.	DESCRIPTION: In vertebrates, vitellogenin (Vtg) is the egg yolk protein synthesized in females under estrogen regulation. Some emerging environmental pollutants called endocrine disruptors mimic estrogenic hormones and cause feminization of aquatic organisms, giving rise to induction of Vtg expression in juvenile and male organisms. In recent years, Vtg-like proteins have been measured in mussels using an indirect method, as a potential biomarker of exposure to endocrine disruptors. Further, a partial sequence of Vtg mRNA was recently sequenced in our laboratory. The aim of this master thesis project is to sequence the whole gene of Vtg using gene walking and to develop specific molecular tools in order to characterize the seasonal variations in transcription levels of Vtg along an annual reproductive cycle. Obtaining the whole DNA sequence of the Vtg gene will allow us to identify its regulatory regions and to understand the basis of regulation of transcription of this important gene. The work will be developed in the framework of a wider research line on the presence and impact of endocrine disruptors in estuaries of the Basque Country.	Miren P. Cajaraville (mirenp.cajaraville@ehu.es) and Maren Ortiz-Zarragoitia (maren.ortiz@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, UPV/EHU, Leioa and Plentzia	consolidated research group CBET, unit of formation and research Ecosystem Health Protection	
A seasonal study of cancer and other histopathological alterations in cockles <i>Cerastoderma edule</i> from the Urdaibai Biosphere Reserve.	Our research group has developed a research line on the mechanisms of carcinogenesis in aquatic organisms, especially devoted to explore potential linkages between cancer development and environmental contamination. In this context we recently discovered that cockles inhabiting the Urdaibai Biosphere Reserve are affected by hemic or disseminated neoplasia. The etiology of disseminated neoplasia in bivalve molluscs is not known but has been generally associated to a possible viral infection, although environmental contamination could also contribute. The aim of this master thesis is to study the prevalence of disseminated neoplasia along the reproductive cycle of cockles, based on the screening of hemolymph samples and on the histopathological analysis of digestive gland and gonad tissues in different cockle populations of the Urdaibai Biosphere Reserve. Furthermore, tissue samples will be	Miren P. Cajaraville (mirenp.cajaraville@ehu.es)	Cell Biology in Environmental Toxicology (CBET) Research Group, UPV/EHU, Leioa and Plentzia	consolidated research group CBET, unit of formation and research Ecosystem Health Protection	

	submitted to chemical analysis to measure levels of bioavailable priority and emerging contaminants. Some samples will be analyzed by TEM in order to search for possible viral infections.			
Developing a novel polymer-based biomonitoring tool for screening of persistent, bioaccumulative and toxic chemicals in marine wildlife.	<p>Coastal areas, which support most of the world's population, are particularly vulnerable to pollution due to population growth and urban/industrial developments. Among these pollutants, the class of persistent, bioaccumulative, toxic (PBTs) compounds poses particular threats to environmental and human health. In fact, PBTs can accumulate to elevated levels in exposed organisms, particularly in lipid rich marine animals, and consequently, cause chronic or acute effects. Sampling and analysis required for the evaluation of PBT exposure and PBT-related risks or links to adverse effects are crucial for both environment and human health. However, traditional approaches like liquid extraction and clean-up techniques are associated with high costs and efforts and typically limited by ethically available sample volumes when it comes to protected marine wildlife such as dugongs and sea turtles. A novel method, known as polymer-based equilibrium passive sampling, has received increasing attention as a rapid, cost effective and non-lethal biomonitoring tool. This approach has been tested mostly with silicon polymer, polydimethylsiloxane (PDMS) as passive sampler material. PDMS has been demonstrated as a simple, low cost, and non-selective sampler for neutral hydrophobic compounds, by which PBTs across a wide range of physico-chemical properties, can be monitored. But, PDMS offers only a relatively insensitive PBT sampling technique as indicated by a high partition coefficient (Klipid-PDMS=38). This prevents detecting the usually low concentrations of PTBs in living organisms or food. In addition, another drawback is that PDMS absorbs lipid which interferes with PBT analysis. This means that samples have to undergo selective chemical clean-up, which not only increases analytical costs but also limits the scope of PBTs that can be analysed with a single PDMS sample. Recently, graft polymerization of various monomers onto PDMS substrate has resulted in a variety of promising modified polymers. The novel synthesized polymers have demonstrated their potential as more sensitive passive sampler. The best performing polymer, PtBuMA, which uses poly tertiary-butyl methacrylate chain grafts, showed approximately one order of magnitude higher sensitivity (Klipid-polymer=6.7±0.53 for dioxin). Additionally, lipid transfer was shown to occur via a swelling process, which is independent of tissue lipid content and proportional to polymer sampler volume. Above all, these recent results highlight that a) higher monomer concentrations likely achieve further enhancements of sensitivity and b) tighter polymer cross-linking is expected to minimize swelling with lipids. The proposed MSc project builds on these recent findings and aims to fine-tune the PtBuMA sampler to optimize its PBT sampling sensitivity and to minimize undesirable lipid uptake. The project is carried out in collaboration with polymer scientists and focuses on testing thermodynamic and kinetic PBT sorptive capacity and lipid uptake of different PtBuMA configurations. The optimized sampler is then validated and applied to monitor PBTs in lipid rich matrices to demonstrate its utility. The specific aims are: (1) Test the sensitivity of a library of modified PtBuMA samplers (different monomer concentrations and degrees of cross linking) by evaluating Klipid-polymer and determining polymer solubility, (2) Evaluate how different monomer concentrations and degree of cross-linking in PtBuMA grafts affect lipid uptake and kinetics of PBT partitioning, and (3) Validate the optimised PtBuMA by sampling PBTs in lipid rich matrices, and to test its applicability for biomonitoring by linking the PtBuMA sampler with instrument-based and in-vitro cell based bioassays for screening and quantification of PBTs in marine wildlife and seafood samples</p> <p>Methods. To achieve these aims, a library of PtBuMA grafts will be generated through collaboration with A/Prof Idriss Blakey at the Australian Institute for Bioengineering and Nanotechnology. The library will contain a range of grafted monomer concentrations and degree of PtBuMA cross linking on PDMS substrate. The library of grafts will undergo screening for sensitivity at Entox according to previously established methods in A/Prof Caroline Gaus' team (Ref. 1). These include partitioning batch tests, whereby spiked polymers and spiked lipid containing matrices are used to quantify the partition coefficient</p>	<p>Associate Professor Caroline Gaus</p> <p>Phone: +61 (0)409 581 906/Fax: +61 (0)7 3274 9003/Email: c.gaus@uq.edu.au</p>	<p>National Research Centre for Environmental Toxicology (Entox) Faculty of Health and Behavioural Sciences The University of Queensland Entox 39 Kessels Road Coopers Plains QLD 4108</p>	Doan Thi Que

	<p>of PBTs at equilibrium. Alternatively, a recently established method by the same team uses polymer solubility for screening of sampler sensitivity (Ref. 1). Both methods will be tested and the most suitable one will be selected for screening of modified PtBuMA sensitivity. Selected PtBuMA grafts will further undergo batch tests to determine partitioning kinetics and lipid uptake and the relationship of these processes with monomer concentration and degree of cross-linking. The methodology for these aspects will follow recently developed approaches (Ref. 1, 2). The best performing polymer will be applied to screen for PBTs in a range of lipid containing matrices, including marine wildlife blubber, blood and seafood. The polymer samples, as well as the original tissues will undergo PBT analysis following methodologies established at Entox (Ref. 2, 4). In addition, the polymer samples will be applied to a range of established in-vitro cell based bioassays (Ref. 2,4) to quantify the chemical mixture response in the sample (BEQbio). This mixture response will be compared to the potency of quantified chemicals (BEQchem) to determine the proportion of toxicity caused by known and unknown/uncharacterized chemicals sampled by the new polymer-based biomonitoring tool. References 1. Dürig W, Grant S, Blakey I, Escher BI, Weijs L, Gaus C. New polymers for passive sampling of persistent bioaccumulative compounds in lipid-rich tissues: improving sensitivity and characterising lipid transfer (Prepared). 2. Jin L, Gaus C, van Mourik L, Escher BI. Applicability of Passive Sampling to Bioanalytical Screening of Bioaccumulative Chemicals in Marine Wildlife. <i>Environmental Science & Technology</i> 2013, 47, (14), 7982-7988 3.Allan IJ, Bæk K, Haugen TO, Hawley KL, Høgfjeldt AS, Lillicrap AD. In Vivo Passive Sampling of Nonpolar Contaminants in Brown Trout (<i>Salmo trutta</i>). <i>Environmental Science & Technology</i> 2013, 47, (20), 11660-11667</p> <p>4. Jin L, Gaus C, Escher BI. Adaptive Stress Response Pathways Induced by Environmental Mixtures of Bioaccumulative Chemicals in Dugongs. <i>Environmental Science & Technology</i> 2015, 49, (11), 6963-6973</p> <p>5. Ossiander L, Reichenberg F, McLachlan MS, Mayer P. Immersed solid phase microextraction to measure chemical activity of lipophilic organic contaminants in fatty tissue samples. <i>Chemosphere</i> 2008, 71 (8), 1502-10</p>				
<p>Title: Distribution of the stable carbon isotope signature of dissolved inorganic carbon at the Scotian Shelf, NW Atlantic Ocean</p>	<p>The Scotian Shelf is located at the boundaries of the subtropical and subpolar gyres in the NW Atlantic Ocean. Its hydrography is mainly characterized by Gulf Stream and Labrador Current waters, as well as the outflow of the Gulf of St Lawrence during the warmer seasons. The Scotian Shelf reveals one of the largest temperature amplitudes observed in the world ocean (20 degrees) and is characterized by a strong and short spring bloom, occurring end of March or early April. The Scotian Shelf has been shown to be a source of CO₂ to the atmosphere, and reveals low pH and carbonate saturation state conditions when compared to the downstream waters of the Gulf of Maine. Sampling of the Scotian Shelf or carbonate system parameters has been carried out since 2006 semi-annually in the framework of the Atlantic Zone Monitoring Program (AZMP), run by Fisheries and Oceans Canada. During the two 2014 expeditions, additionally samples have been taken for the stable isotope composition of dissolved inorganic carbon (DI13C). The proposed research project will involve participation in the 2016 April expedition, which will take approximately 3 weeks of time, and will provide insight and understanding of the sampling strategy, analytical techniques, and framework relevant for the DI13C data. The scientific description and initial interpretation will constitute the core part of the MSc research work, to be carried out in the department of Oceanography. This work will be firmly embedded in ongoing activities, and discussions and collaboration within the department will be offered over a wide range of expertise. The expected results will constitute the first ever description of the DI13C distribution at the Scotian Shelf and will unravel the key processes shaping the DI13C signal, which are biological processes and mixing of water masses. Furthermore, the results will establish the DI13C baseline, which will be used for future studies of the invasion of anthropogenic CO₂ and ocean acidification employing the so-called Suess-effect, which is the dilution of the natural DI13C distribution by isotopically lighter fossil fuel CO₂.</p>	<p>Professor Helmuth Thomas (helmuth.thomas@posteo.org).</p>	<p>FACULTY OF SCIENCE, Department of Oceanography, University of Dalhousie, Canada</p>		<p>Nuralam Mistri</p>

<p>Beach Erosion prevention using Posidonia Oceanica Meadows</p>	<p>Posidonia Oceanica, commonly Neptune's Grass, is the most frequently found seagrass species in the Mediterranean Sea. It settles in sandy shallow waters (1m-35m) producing dense underwater meadows. Each plant has 5-8 ribbon like leaves that can reach up to 1m high and 10mm width. Rhizomes and roots stabilize the plant making it invulnerable to currents and waves. It is considered as a high biodiversity hot spot attracting species for nursing, breeding and feeding and signifies clean waters. Moreover, Posidonia Oceanica occurs to produce high levels of settling rates and sediment stabilization.</p> <p>AIM This study, hosted by the HCMR (Hellenic Centre for Marine Research) in Athens, Greece, will evaluate the effects of Posidonia Oceanica meadows to the processes responsible for beach erosion. Specifically, it will show the effects of Posidonia Oceanica meadows to the wave damping and wave induced currents, which are the primary physical processes that alter the coastal geomorphology. Furthermore, it will measure the settling rates within and besides the meadows.</p> <p>This research will measure the wave damping and current weakening abilities of Posidonia Oceanica. Specifically, it will define the characteristics of Posidonia Oceanica that mostly affect wave damping and currents velocities (drag coefficient, plant density, leaf length, leaf width, leaf stiffness etc.). Moreover, it will demonstrate the flow characteristics that play a significant role on beach erosion (wave period, Reynolds Number). Afterwards, settling rates measurements will be taken under each combination of meadow's and flow's characteristics. Finally, this research will focus on several ways to take advantage of Posidonia Oceanica properties in order to fight off beach erosion. Considering soft stabilization techniques to be more effective than hard stabilization, this research will, also, study the beach armouring abilities of Posidonia Oceanica meadows (artificial or not) accompanied with geotextile sand-bags. METHODOLOGY The research will be conducted in the beach [____] and several in-situ measurements will be collected. An area occupied by Posidonia Oceanica meadows and an area of plain sand will be surveyed and compared. An effort to collect measurements in all different possible flow conditions will be made. All possible combinations of wave characteristics and plant characteristics will be examined. The results will demonstrate the differences in wave damping, turbulence and wave induced currents in the two compared sites. Finally, a survey with Posidonia Oceanica strengthened geotextile bags will be performed in order to compare their endurance and vulnerability comparing to plain geotextile bags.</p> <p>EXPECTED RESULTS Based on the theory that the Posidonia Oceanica leaves will induce a drag coefficient to the incoming flow (unidirectional or oscillatory), the expected results will show wave height attenuation, energy loss due to drag forces, significantly reduced current velocities and higher settling rates. These results should be proportional to stem density, leaf length, leaf width etc. Furthermore, according to literature, high wave period waves are expected to be significantly more attenuated comparing to low period waves. Finally, the experiment should confirm the fact that geotextile bags accompanied with Posidonia Oceanica leaves should be more resilient to tear shear forces, making this armouring technique more resistive to time and storms and at the same time, less costly due to low maintenance frequency.</p>	<p>Christos Anagnostou</p>	<p>Hellenic Centre for Marine Research</p>		<p>Emmanouil Tsagkarakis Saloustrou</p>
<p>Analysis of sea ice concentration data from AMSR2 (89 GHz channel) near Mertz Glacier Tongue, Antarctica</p>	<p>The student will conduct research dealing with sea ice concentration data from AMSR2 (89 GHz channel) near Mertz Glacier Tongue, Antarctica. In the investigated area landfast sea ice often prevails for several years. Open water areas, polynyas, can form along the fast ice edge within the drifting sea ice. The ASI ice concentration algorithm developed at the University of Bremen (www.iup.uni-bremen.de:8084/amr2/), however, for some instances also shows erroneous open water areas within the fast ice regions. One task would be to evaluate the possible reasons for these apparent retrieval errors. Flooding from the ocean (slush or superimposed ice) or atmosphere temperature changes could be possible mechanisms which could influence the microwave brightness temperature and lead to the problem. Further research could look into the sea ice - ocean interactions in that region: the sea ice often is kept in place by grounded icebergs in that region. However, under some conditions (tides?, swell?, wind?) the ice breaks up and gets loose.</p>	<p>Gunnar Spreen gunnar.spreen@uni-bremen.de</p>	<p>Institute of Environmental Physics, University of Bremen</p>		<p>Hoi Ming Lam</p>

	<p>el trabajo consistiría en hacer muestreos sucesivos destinados a recolectar la comunidad de crustáceos decápodos en sebadales. Para hacer un buen muestreo y asegurarnos que tenemos a la comunidad de crustáceos bien representada, hay que testar que muestreadores son más eficientes y porque (este trabajo puede que ya esté realizado en las fechas que te incorpores, pero los datos estarían a disposición de tu trabajo de Máster, si se diera el caso). El segundo objetivo, es ver si hay cambios en la comunidad estudiada en función del momento día/noche en el que se muestrea.</p> <p>Lo descrito anteriormente, sería el trabajo de campo, muestreo en el mar, toma de muestras (seinenet, nasas y bombas de succión). La segunda fase como bien dice Fernando, sería, en primer lugar, clasificar e identificar las especies capturadas. En segundo lugar tomar los principales datos de interés útiles para la descripción la ecología de las especies más representativas de la comunidad (sexo, tamaño, condición ovígera, abundancia, dimorfismo, estado de madurez sexual, fecundidad...).</p>	Fernando Tuya	IU-ECOQUA, Grupo en Biodiversidad y Conservación, Departamento de Biología, Universidad de Las Palmas de G.C.		Aitor Escribano
Sedimentation effects of an ecosystem engineer, <i>Crassostrea gigas</i>, on intertidal flats	<p>Reef building bivalves, such as oysters and mussels, are common features of tidal flats worldwide. They provide many ecosystem services including seston filtration, benthic-pelagic coupling, refuge from predation, abundant prey resources and coastal protection. Oyster reefs modify patterns of sediment deposition, consolidation, and stabilisation. They are autogenic ecosystem engineers as they modify their surrounding sedimentary landscape through their physical structures (Jones et al. 1994, Gutiérrez et al. 2003). A general understanding of the effect of these structures on tidal flat structure, morphology, and ecology is however still lacking. Spatial, scale-dependent interactions between reef-forming ecosystem engineers and surrounding sediment structures, and the knock on effect this has on communities of sedentary benthic organisms can be an important determinant of the large-scale community structure of tidal flats (Bos and van Katwijk 2007, Donadi et al. 2013). Therefore, the ability to predict the impact of an ecosystem engineer is both fundamentally interesting and of considerable value in conservation and management (Hastings et al. 2007).</p>	Oliver Jewell ² , Tom Ysebaert ²	Royal Netherlands Institute for Sea Research (NIOZ) Yerseke, Dept. Spatial Ecology/Delta Research, Korringa Weg 7, 4401NT, Yerseke, Netherlands		Rick Leong
Calcification in Coralline Algae	<p>This master's project will consist of experiments designed to investigate the process of calcification in coralline algae (<i>Lithothamnion</i> spp.). The student will incubate the algae under light and dark conditions with radioactive tracers (⁴⁵Ca, ¹⁴C-HCO₃⁻) and will then use microautoradiography to visualize where the tracers are incorporated into the skeleton of these calcifying algae. The experiments will be conducted at the Max Planck Institute for Marine Microbiology in the Microsensor working group. This project is part of</p>	Supervisor: Dr. Laurie Hofmann: lhofmann@mpi-bremen.de http://www.mpi-bremen.de/Laurie_C._Hofmann.html			Svetlana Vasic

	<p>bigger project CarMALG: Crustose coralline algae (CCA) are calcifying algae that are important to coastal stability, beach formation, and coral reef structure. There is growing concern that these organisms are sensitive to global climate change, which will have important consequences for coastal and reef stability. Despite their significance and sensitivity, their basic photosynthetic and calcification mechanisms are not well understood. In this project, the fellow will establish a better understanding of these mechanisms by studying CCA specimens along a latitudinal gradient in the Northeast Atlantic. The research will be conducted at the Max Planck Institute for Marine Microbiology in Bremen, Germany within the Microsensor Research Group led by Dr. Dirk de Beer. The activities and results of this project will be shared on a Blog and Facebook page to enhance public awareness of the project. Furthermore, the fellow will facilitate development of a Virtual CCA Research Group to foster communication among scientists world-wide working with CCA which will elevate the impacts of this project to a global scale. Both field sampling and laboratory experiments are used to pursue the goals of the project, which are: 1) to determine the environmental factors influencing the stable carbon isotope signatures of Lithothamnion spp. along a latitudinal gradient, 2) to determine the plasticity of dissolved inorganic carbon (DIC) uptake mechanisms in response to light and temperature and 3) to determine how photosynthesis and calcification are linked to DIC uptake mechanisms. The latitudinal gradient consists of eight sampling locations in the North Atlantic from Svalbard to Cape Verde in the east and from Florida to the Caribbean in the west. The stable carbon isotope signatures of collected samples are measured to determine the plasticity of DIC uptake along the latitudinal gradient in relation to environmental conditions measured at long-term monitoring stations. In the lab, microsensors are used to measure pH, oxygen and calcium fluxes within the diffusive boundary layer (DBL) at the surface of the algae. Because DIC uptake depends heavily on the DBL, microsensors provide a unique method for determining the effects of temperature and light on photosynthesis and calcification within the microenvironment at the interface between the external seawater and the algal surface. Successful completion of the project will provide the first study on latitudinal patterns and the flexibility of DIC uptake mechanisms in a calcifying macroalga and will improve the</p>				
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	scientific knowledge of the relationship between DIC uptake, photosynthesis and calcification under changing environmental conditions and across biogeographical ranges.				
Dinámicas de zooplankton, calibración de un "zooscan" y datos satelitales/modelización).		Sylvie GOBERT Sylvie.gobert@ulg.ac.be	MARE Centre (Laboratory of Oceanology), University of Liege, Belgium. Liege/STARESO:		Lovina Fullgrave