MAIA

Marine protected areas
in the Atlantic arc

Developing common monitoring strategies for EU Atlantic MPAs

Desenvolvimento de estratégias comuns para monitorização de AMP na costa Atlântica da UE

MAIA Workshop

8th & 9th November 2010 **Sesimbra, Portugal**



Workshop Proceedings

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IPIMAR

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Authors: Miguel Neves dos Santos

Contact: INRB I.P. / IPIMAR
Av. 5 de Outubro s/n
8700-305 Olhão, Portugal
mnsantos@ipimar.pt

Workshop's organizer: IPIMAR
http://www.inrb.pt/

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MAIA: a European project

Sharing our experience.

The purpose of MAIA partners is to create a **network of MPA managers, researchers and stakeholders** to ensure better knowledge and therefore to enhance the **development of a consistent, efficient and accepted network of Marine Protected Areas** in the Atlantic arc.

The MAIA project gathers **9 partners from 4 countries** (United Kingdom, France, Spain and Portugal), involved in MPA designation and management.

MAIA sets up four main technical lines of work:

- *Produce a report on the status of existing MPAs in the Atlantic Arc*
- *Setting up common monitoring strategies*
- *Implementing management plans*
- *Involving stakeholders*

As lead partner, the French Agency for Marine Protected Areas, coordinates the project implementation.

The 2010 – 2012 Action Plan

Organization of technical workshops on MPA management issues, bringing together stakeholders as MPA managers, scientists and users (e.g. fishermen)

Site visits in each partner country to enhance the transfer of information, knowledge and know-how

Field studies to be carried out by MAIA partners, promoting the exchanges within the network

Creation of a dedicated website, including a private collaborative space, document and GIS databases used to establish a baseline on the status of MPAs in the Atlantic arc

Production and dissemination of documents and project results and achievements

MAIA Workshop Agenda

"Developing common monitoring strategies for EU Atlantic MPAs"

The objectives of the workshop are:

- Share international expertise on best practices on MPA monitoring strategies, covering: environmental aspects (e.g. biodiversity; habitat functioning) and socio-economics (fisheries and other activities);
- Allow MAIA partners to briefly present relevant monitoring methodologies in use in their own countries;
- Define common monitoring methodologies to allow comparisons of the performance between MPAs within the EU Atlantic Arc Area

This international workshop is coordinated by IPIMAR (PT) in the framework of MAIA European cooperation project.

Monday November 8th

08:30	Registration
09:00	Open Ceremony
09:15	Brief overview on the MAIA project

Session 1 Monitoring strategies for environmental aspects of MPAs

Chair persons Emanuel Gonçalves & Jennifer Caselle

09:30 – 10:00	**Biodiversity measurements and indicators in MPAs: monitoring procedures and evaluation methods** Emanuel Gonçalves, ISPA (Portugal)
10:00 – 10:15	**First experience of biodiversity indicators implementation in a French Marine Natural Park** Thierry Canteri, Iroise marine natural park (France)
10:15 – 10:30	**Monitoring highly variable MPAs: the utility of control charts for saline lagoons** Bill Sanderson, Reader in Marine Biodiversity at Heriot Watt University (United Kingdom)
10:30 – 10:45	**Coffee-break**
10:45 – 12:45	**Open discussion**
12:45 – 14:30	**Lunch**
14:30 – 15:00	**Assessing ecosystem function in MPAs: monitoring design and analytical considerations with examples from California, USA** Jennifer Caselle, University of California (USA)
15:00 – 15:15	**What indicators for which MPA ecological effects? Some examples in Atlantic-Mediterranean MPAs** José Antonio García Chartón, University of Murcia (Spain)
15:15 – 15:30	**Indicators for assessing effects of Marine Protected Areas, from biodiversity measurements to ecosystem functioning: some examples** Eric Thiébaut, Station biologique de Roscoff (France)
15:30 – 16:30	**Open discussion**
16:30 – 16:45	**Coffee-break**
16:45 – 18:00	**Open discussion**

Tuesday November 9th

Session 2 Monitoring strategies for socio-economic aspects of MPAs

Chair persons Patrick Berthou & Mike Kaiser

09:00 – 9:30 **Monitoring fisheries on MPA's: articulation with Data Collection Framework (DFC) for the Common Fisheries Policy**
Patrick Berthou, Ifremer (France)

09:30 – 9:45 **Performance indicators for the Professor Luiz Saldanha Marine Park: a multi-criteria approach**
Karim Erzini, University of Algarve (Portugal)

10:00 – 11:00 **Open discussion**

11:00 – 11:15 Coffee-break

11:15 – 12:30 **Open discussion**

12:30 – 14:00 Lunch

14:00 – 14:30 **Assessing and valuation of non-extractive uses in MPAs**
Michel Kaiser, University of Bangor (United Kingdom)

14:30 – 14:45 **Joint construction and appropriation of indicators by users, managers and scientists: the case study of recreational marine uses indicators in Chausey archipelago.**
Eric Oulhen, SyMEL (France)

14:45 – 16:30 **Open discussion**

16:30 – 16:45 Coffee-break

Session 3 Proposal on common monitoring strategies

Chair persons Eric Thiébaut

16:45 – 17:15 **Proposal on common monitoring strategies**
Emanuel Gonçalves, Jennifer Caselle, Patrick Berthou and Michel Kaiser.

17:15 – 18:15 **Open discussion**

18.15 – 18.30 **Final remarks and closure (MAIA coordinator)**

20:30 MAIA Social dinner

ABSTRACTS

Session 1 Monitoring strategies for environmental aspects of MPAs

Monday, November 8th, 09:30 – 10:00

Biodiversity measurements and indicators in MPAs: monitoring procedures and evaluation methods

Emanuel Gonçalves is an Associate Professor at the Eco-Ethology Research Unit of ISPA – University Institute of Applied Psychology and currently serves as President of the Board of the Cooperative that runs the Institute. His research interests are marine conservation (in particular the role of Marine Protected Areas to ocean governance), marine ecology and behavior of reef fish, fish larval ecology and recruitment. His studies are centered on several aspects of fish biology, ecology and behavior, namely: life-history strategies, reproductive behavior, territoriality, alternative reproductive tactics, community structure and dynamics, larval development and ecology, recruitment processes and conservation. He has dedicated particular attention to the comparative approach with littoral fish species, particularly blennies, gobies and gobiesocids. He as been also involved in studies of recruitment processes and patterns and structuring mechanisms of littoral fish communities which intent to implement a medium to long term database system, projected to contribute to the monitoring, management and design of Marine Protected Areas in Portugal. He has served as deputy-head of the Portuguese Task Group for Marine Affairs, where he contributed to the approval and implementation of Portugal's National Ocean Strategy, was the chair of the EU group that lead the negotiations on marine and coastal issues at COP 9 of the Conventional on Biological Diversity, and is currently a Science Adviser for the European version of the Science of Marine Reserves initiative.

PRESENTATION ABSTRACT

Monitoring procedures in MPAs are central to characterize communities, measure change through time and disentangle the effects of natural variation from those of human-induced changes. Here I begin by presenting an overview of why we need biodiversity measurements and indicators and what we are trying to accomplish with MPAs, both for conservation and fisheries management. The need to clearly define the goals we are trying to achieve when designing the MPAs and plan the monitoring programs right from the beginning is central to a successful program. Next I will summarize the main methods and tools to monitor changes in marine communities and give some examples on how they can be used as standard procedures for within and between habitat and site comparisons. The integration of both population parameters, such as density (i.e. abundance), size and age structure, population dynamics and larval production, and community parameters, such as assemblage diversity and composition, trophic levels, functional groups, ecologically important species (e.g. keystone species, foundation species, ecosystem engineers), on the design of monitoring programs is a fundamental issue to be discussed. I will address the most used methods which are: diving surveys, ROVs and/or submersibles, collaborative fisheries monitoring, experimental fisheries, commercial fisheries, recreational catch and release, recreational divers, socio-economic surveys. Then I will talk about the use of metrics and indicators associated with different monitoring procedures and their importance for standard comparisons. The need to make sure these metrics and indicators are adaptive to different systems will be highlighted. The use of functional groups and life history traits which respond in different ways to changes in pressures (both natural and human-induced) will also be addressed. The long-term nature of these programs calls for the need to choose indicators which are comprehensive, accurate, sensitive and cost-effective and, most important, replicable in different systems and through time.

Monday, November 8th, 10:00 – 10:15

First experience of biodiversity indicators implementation in a French marine natural park (Iroise)

Thierry Canteri is since 2008 the Deputy manager of the Marine Nature Park of Iroise, the first French marine protected of 3500 km^2 create in October 2007. Previously (2006-2008) he was the Deputy manager of the Office of the Maritime Affairs in Martinique (French west Indies) and the leader of the Service of the Economic Affairs and the Regulations, coordinator of the fishing control and of the Regional Office of the Maritime Affairs of Haute-Normandie.

PRESENTATION ABSTRACT

1) The French national context

In order to respect its international commitments and to protect the biodiversity, France has to:

- develop a coherent, complete and representative network of MPAs
- make it efficient

The French government decided the creation of the MPA French Agency, in April 2006 and the adoption of a national strategy for MPAs creation. There is long-term objectives of the French network of MPAs:

- conservation of natural and cultural heritage in a good state
- conservation of ecological services (nursery, breeding zones…)
- sustainable development of maritime activities (fishing, transport, tourism)
- good governance

2) MPA's indicators for national objectives

In order to evaluate/monitor the efficiency of each MPA and the network we are creating the French MPA's agency has to implement:

- « Driving boards » for each MPA and for the network of MPAs
- Panel of quantitative indicators for MPAs (overseas and mainland) regarding to their targets

3) Biodiversity indicators implementation in the Natural Marine Park of Iroise

With scientists we identified the stakes in biodiversity of the area and we worked to build indicators of management which allow to know in which state of preservation are the species or the concerned housing environments. To be certain to follow these indicators regularly, they must be simple to measure and no expensive. These indicators are followed regularly (every year for example) according to precise but simple protocols to detect changes of the environment.

So, in the park we have indicators which are regularly followed on (many of them by the agents of the park):

- marine mammals : for example born number of seals and presence known for seals and special places;
- and sea birds : for example born number of sea birds.

All the indicators are then put back on a scale of gradual value of "very bad" in "very well" which are the dashboard of the marine park. It's the regular and rigorous follow-up in the time that will establish assets for the knowledge of the marine environment and to propose adapted measures of management to the authorities.

Monday, November 8th, 10:15 – 10:30

The impact of increasing numbers of anchoring vessels in a MPA

Bill Sanderson (Reader in Marine Biodiversity at Heriot Watt University, United Kingdom) work has concentrated on the marine biodiversity research needed to support sensitive management and sustainable development. He has experience and ongoing research interests in Marine Protected Areas and Marine Spatial Planning (including Energy Developments). He has worked over 17 years in government agencies as a marine ecologist and monitoring specialist, concentrated on species and habitats of high nature conservation importance such as biogenic reefs, lagoons and habitats that support higher predators. *Modiolus modiolus* biogenic reefs have been a strong focus of study for more than ten years; involving hydroacoustic mapping, remote cameras and in situ diving work. His work has underpinned MPA designation, the formation of bylaws, proactive management, assessment and enforcement. He has also worked on the recovery of scoter duck (*Melanitta nigra*) and their benthic prey after the Sea Empress oil spill. This work has contributed to the proactive management of Carmarthen Bay (S Wales, UK) and been the corner-stone of its subsequent notification as the UKs first fully marine Special Protection Area (EC Birds Directive, 79/409/EEC). Oil spill recovery work, coupled with experience of EU funded programmes and a previous project in the Galápagos lead to his recruitment by DGXI Civil Protection to the EU Task Force during the Jessica oil spill. Over several years he has lead the development of an evidence base for intertidal shellfish and wading birds that has enabled the application of Individuals Based Models in collaboration with Conservation Agencies, Fisheries Agencies, contractors and researchers at Bournemouth University (formerly CEH). Conservation objectives have been developed, management scenarios tested and the condition of MPAs assessed. This work area has featured in the Charting Progress report, a government assessment of the state of UK seas. He has contributed to this assessment and the developing Marine Strategy Framework Directive through work on the Healthy and Biologically Diverse Seas Evidence Group. He has also served on other UK government monitoring groups such as the Interagency Marine Monitoring Group and the UK Technical Advisory Group, largely concerned with methods and strategy development under the Habitats Directive and the Water Framework Directive (92/43/EEC and 2000/60/EC). Overall, he has lead government applied science and monitoring projects and programmes at the forefront of UK marine conservation implementation and MPA development (totaling about £4m). He has authored more than 40 reports, papers and a book.

PRESENTATION ABSTRACT

Managing MPAs in the UK has marked an expansion of national marine monitoring efforts. However, monitoring biodiversity necessarily covers a wider range of benthic habitats than the comparatively stable and/or depositional habitats that have been targeted in the past. Likewise, consideration has now also been given to a wider range of anthropogenic impacts than those relating to contaminants and water quality. Coastal saline lagoons are rare habitats in the UK and are protected as MPAs or within MPAs by national and international conservation legislation. Cemlyn lagoon (Anglesey, Wales) is a small marine protected area containing a rare and specialist invertebrate fauna. We set out to develop a programme of monitoring to inform the management of the site which. Monitoring here is challenged by the variability of the habitat and the desire not to damage it. The lagoon had a salinity regime that varied by 35PSU and temperature that varied by 25°C. Tidally induced patterns were seasonally exaggerated and the effects of rainfall and wind were stochastically superimposed. Our results emphasised the value of high frequency sampling of the physical environment using data loggers, and interpretation of results using control charts to inform site management. This approach detects ecologically important patterns from a highly variable background. We applied a multivariate control chart analysis to lagoonal infauna for the first time and

interpreted changes at monitoring stations using statistically derived control limits and those empirically derived from other lagoons, thereby developing a management indicator that encompasses local and national variation. This study suggests that control charts have utility as tools for assessing highly variable and poorly known habitats in Marine Protected Areas, because new data is tested against the available knowledge of ‘acceptable values’, providing an out-of-control early warning and a starting point for investigation and management action. Until now, creating statistically and contextually meaningful targets for lagoon condition and assessing ecological quality under European Directives (Habitats; WFD) has been elusive, because high variation makes type or reference conditions hard to describe. Furthermore, the majority of extant anthropogenic pressure indices use high abundances of stress-tolerant species and low diversity and evenness, conditions that are natural for lagoons but do not appear to impact on the approach we have taken here. This case study illustrates that where MPAs seek to incorporate “representativity”, ie across the range of potential habitat types, management and statutory reporting may need the development of new types of indicators and monitoring strategies.

Monday, November 8th, 14:30 – 15:00

Assessing ecosystem function in MPAs: monitoring design and analytical considerations with examples from California, USA

Jennifer Caselle is a Research Biologist at the Marine Science Institute, University of California, Santa Barbara (USA). She is also the Science Coordinator for PISCO (Partnership for Interdisciplinary Studies of Coastal Oceans; www.piscoweb.org). She received her B.S. in Zoology from U.C. Berkeley and her PhD in Marine Ecology from U.C. Santa Barbara. Dr. Caselle's research is broadly focused on marine conservation and reef ecology. She currently works in both coral reef and kelp forest ecosystems studying community dynamics, recruitment and larval dispersal and movement patterns of fishes. Dr. Caselle has designed and managed a large-scale field-based monitoring program of kelp forests in the California current ecosystem with goals of assessing long-term changes due to climate and anthropogenic impacts. This program has become the basis of Marine Protected Area monitoring throughout California and the west Coast of the United States.

PRESENTATION ABSTRACT

Marine Protected Areas (MPAs) are considered by many as an essential tool for ecosystem-based management, by their aim to protect and conserve all components of marine ecosystems and by increasing our understanding of how humans influence marine ecosystems. To date, most approaches to managing and protecting marine resources have been resource-specific, managing the state of each particular resource (e.g., a fished species) independent of other resources and without consideration of impacts to ecosystem structure (e.g., species composition, diversity, habitat quality), function (e.g., species interactions, productivity, habitat roles) or services (e.g., non-consumptive uses and values). Key to understanding how humans influence marine ecosystems is distinguishing the extent to which changes in resources and ecosystems are caused by human activities (e.g., fishing), or by natural variation in the marine environment (e.g., climatic variability). The design of monitoring and evaluation programs for MPAs is based upon a wide variety of considerations, including:

- well-articulated and realistic MPA goals and objectives
- objective-based hypotheses and predicted responses of resources and ecosystems to reserve establishment
- appropriate objective-based indicators of system response (e.g., density and size-structure of exploited species populations)
- informed estimates of the spatial and temporal scales of system responserecognized sources of uncertainty, sampling bias and variance structure in response variables
- MPA design (e.g., the number of replicate MPAs of similar regulatory and habitat types) and identification of appropriate reference sites outside MPAs
- appropriate analytical models (e.g., before-after-control-impact; BACI)
- balancing sampling requirements with financial and environmental constraints.

In this talk I will present both conceptual (where, when, how often) aspects of MPA monitoring, practical aspects (how to monitor and why) along with potential analytical frameworks for understanding change in MPAs. While I will use examples from a network of MPAs in central and southern California, the results are generally applicable to many temperate and subtropical marine ecosystems. Lastly I will present ideas for integration of monitoring activities both within and across ecosystems. Identification of appropriate species to monitor depends on their ecological and economic importance as well as their statistical attributes (i.e. population variability relative to abundance and magnitude of response to MPAs).

Ecologically important species will include such functional relationships as keystone predators, habitat engineers, indicators of trophic levels, and major prey, predators and competitors with fished species. Identifying indicator species will help to focus monitoring effort by prioritizing species and groups of species to be surveyed. Understanding the biological roles that taxonomically similar species play in a broader ecosystem enables monitoring efforts to be further streamlined by potentially decreasing the need for high taxonomic resolution and increasing the ability for a wider variety of personnel to be involved in data collection.

Monday, November 8th, 15:00 – 15:15

What indicators for which MPA ecological effects? Some examples in Atlantic-Mediterranean MPAs

José Antonio García Chartón is Associate Professor of Ecology at the University of Murcia. He has published 67 publications (from which 32 internationally peer-reviewed papers) on reef fish ecology and marine conservation, with emphasis on MPAs. He has participated in 22 research projects mostly on MPAs, from which 6 CE-funded projects (e.g. ECOMARE, BIOMEX, EMPAFISH, AMPAMED); presently he is developing projects about mobility of groupers (tagging and acoustic tracking), settlement and recruitment dynamics of reef fishes, and genetic connectivity of marine species. He has been involved in 50 contracts with administrations or private companies on subjects such as environmental impact assessment of human activities in the coast, invasive species, and the monitoring of MPAs (focused on the Cabo de Palos – Islas Hormigas marine reserve). He has presented 83 contributions to scientific congresses. He supervised 2 PhD, 4 MSc and 5 Graduate theses, and participated in a number of doctoral committees in Mexico, France, Puerto Rico and Australia. At present he is supervising 4 PhD theses. His research has been mostly developed in the Mediterranean Sea, but other research projects were carried out in the Atlantic (Macaronesian Archipelagos and Brazil) and Pacific (French Polynesia, Kingdom of Tonga). He regularly participates in international initiatives about MPAs, climate change and conservation of marine biodiversity (in the framework of RAC/SPA, MedPAN-South project, etc.).

PRESENTATION ABSTRACT

Provided that they are effectively enforced and properly managed (otherwise nobody should expect any positive effect), MPAs have to be adequately monitored, as integrated monitoring and evaluation constitute a key factor for MPA success. There are three crucial objectives of MPA monitoring: (1) to assess MPA effectiveness in order to ascertain whether or not they are producing the expected benefits in terms of conservation (e.g. population or ecosystem recovery) and/or management objectives (e.g. enhancing local fisheries), (2) to allow and nurture adaptive management (changes in design, surveillance, zoning, etc) of the MPA, and (3) to fulfil the responsibility with society to learn from the nature laboratory experiments that MPAs are. Monitoring objectives are to be set up in relation to expected goals and objectives of the MPA, but target ecological effects of protection are commonly unspecified and thus at present using a wide scope of ecosystem indicators is the only possibility.

Researchers of the Dept. of Ecology at the University of Murcia (Spain) are conducting monitoring of reef fish assemblages in the Cabo de Palos – Islas Hormigas marine reserve (Murcia, SW Mediterranean) since 1990, including a long-term temporal survey (using underwater visual census – UVC), following-up of reef fish colonization (light-traps) and recruitment (UVC) taking spatial variations of habitat structure into account (by means of visual and photographic assessment), and monitoring the fishing activity in the area (based on sampling onboard, questionnaires, and other approaches such as diagnosing ‘shifting baselines’, and bio-economic modelling). Fish spillover has been monitored by performing UVC surveys at multiple sites within and, across the boundaries, outside MPAs at increasing distances from the borders, and by carrying on fisheries surveys close and at increasing distance from the MPAs’ borders (BIOMEX project), by undertaking genetic connectivity studies, and at present by studying the mobility of groupers (by external tagging and acoustic tracking). Other studies in this marine reserve include; following-up of gorgonians populations before and after a mass mortality event, impact of recreational divers, survey of allochthonous species (Caulerpa racemosa, Percnon gibbesi), and evaluating the use of volunteers to assist in monitoring.

Outcomes of recent EU-project EMPAFISH (www.um.es/empafish) included some recommendations regarding MPA monitoring:

- Monitoring should ideally begin before the design and implementation process, and have continuity in order to show the long-term evolution of key variables during the time span of the protected area.
- Monitoring of MPA effects and evolution should be an objective of MPA management, should be undertaken clearly specifying the targets to be evaluated, and should be based on appropriate, sound sampling strategies.
- More coordinated and continuous monitoring activities are needed in EU MPAs, including the currently lacking assessment of the achievement of conservation goals.
- There is a pressing need for directed monitoring of exploited stocks with the objective of analysing the effect of marine protection on adjacent fisheries, especially for species that are most likely to show a response to protection. Special emphasis should be put on the effects of (and the consequences on) recreational fishing activities
- Monitoring should be comprehensive and holistic, integrating concerns related to biological and ecological variables with socio-economic and governability ones. Major emphasis should be done on the socio-economic effects of MPAs, which has been regularly neglected to now.

Monday, November 8th, 15:15 – 15:30

Indicators for assessing effects of Marine Protected Areas, from biodiversity measurements to ecosystem functioning: some examples

Eric Thiébaut is an Assistant Professor at the University Pierre & Marie Curie (Station Biologique de Roscoff, France). His current fields of interest involve: processes of larval dispersal of marine invertebrates and the consequences of dispersal on population dynamics (persistence of isolated populations, the ability of marine species to recolonize sites following disturbances or to response to global change); biophysical modeling; responses of coastal benthic communities to natural and anthropogenic disturbances; long-term monitoring of benthic communities and marine biodiversity; and biology and ecology of hydrothermal vent fauna. He is the coordinator of one scientific project in the Program "EcosphèreContinentale et Côtière", had previously coordinated one workpackage in the National Program "EnvironnementCôtier" - Chantier 'Baie du Mont-Saint-Michel'. Currently is the manager of the MSc. in "Oceanography and Marine Environments", at the University Pierre & Marie Curie. He has been publishing the results of his research in peer reviewed international journals and acting as supervisor of 6 PhD and 8 master students in marine ecology.

PRESENTATION ABSTRACT

Marine Protected Areas have become a very popular tool for marine biodiversity conservation during the last decade, raising numerous questions on the monitoring strategies to develop to evaluate their efficiency in terms of biodiversity conservation, ecosystem functioning and goods and services for human societies. Recent syntheses highlighted that marine reserves in tropical and temperate regions have a statistically positive effect on 4 key biological variables (i.e. biomass, density, size and species richness). However, these effects of marine reserves depend on the monitored variables. Furthermore, the magnitude of the reserve effects varied greatly according to different parameters: (i) the properties of the studied species (e.g. life history traits, trophic mode), (ii) the characteristics of the reserve (e.g. size, age), (iii) trophic cascades and,(iv) the activities occurring outside the reserve or inside the reserve prior to protection. Such variability involves a long-term monitoring of different species and functional groups inside and outside the MPA. According to the relationships between marine biodiversity and ecosystem functioning, marine reserves can be also a piece of the ecosystem-based management whose aim is to sustain the long-term capacity of marine ecosystems to deliver ecosystem services. While MPA cannot provide the full suite of ecosystem services (i.e. production services, regulation services, cultural services and over-arching support services), different studies have shown that MPA can be a useful tool to manage some fisheries by protecting large productive populations and by increasing fisheries outside reserves through the spillover of adults or the export of larvae produced in reserves. Such effects have been reported for numerous species including the scallop Pectenmaximus in the Irish Sea. A good assessment of larval export requires that we measure the larval production inside and outside reserves and that we develop tools to measure the connectivity between reserves within a networkand between reserves and fished areas. On the other hand, marine reserves can also increase the resilience of marine ecosystems as reported through the measurements of the temporal variability of biomass or density of fished species. Finally, while conservation biology in the marine environment mainly focuses on endangered charismatic species like seabirds or diversified habitats like seagrasses, it commonly disregards common invertebrate species despite their potential functional value. In the Bay of Mont-Saint-Michel and the Chausey Archipelago (English Channel), recent studies on beds of the sand mason worm Laniceconchilega showed that this common species in the coastal zones of the NE Atlantic increase coastal biodiversity, are attractive feeding grounds for birds and fishes and may have a high socio-economic value.

Session 2 Monitoring strategies for socio-economic aspects of MPAs

Monday, November 9th, 09:00 – 9:30

Monitoring fisheries on MPA's: articulation with Data Collection Framework (DFC) for the Common Fisheries Policy

Patrick Berthou (Ifremer, France) has been involved since 1977 in a number of projects relative to fisheries data network, fish biology, shellfish stock assessment and fisheries management. He began his career as fisheries biologist in the fishermen committee of Granville, and later worked as a free lance for different fishermen committees. Since 1985, he works as a fisheries research scientist at Ifremer, where he co-ordinated (1999-2004) the French National Fisheries Monitoring System. This program monitored resources, harvesting and economics. From 2004 to 2008, he was heading one of the two fisheries programs at Ifremer covering the national monitoring system, as well the stock assessment and regulation options projects. Within this program, he has created a project named RECOPESCA, a network of fishing effort and environment parameters measurements aboard fishing vessels, participating on a voluntary basis. Since 2009, he is heading the program "Ecosystemic approach for fisheries" at Ifremer. His main fields of interest involve fisheries integrated monitoring systems, shellfish assessment, fleet dynamics, small-scale coastal fisheries and ecosystem management.

PRESENTATION ABSTRACT

The Data Collection Framework (DCF) is a Community framework for the collection, management and use of data in the fisheries sector to support scientific advice regarding the Common Fisheries Policy (CFP). Each Member States is required to collect data on biological and economic aspects of their own fisheries and related fisheries sectors. DCF includes a module of evaluation of the effects of the fishing sector on the marine ecosystem. Based on the fleet-fishery-metier approach, DCF could be the structuring basis for fisheries monitoring in MPA's contexts. For many topics, a local densification of the sampling rate of the same methodologies used in the DCF National Program could be sufficient in order to produce metrics and indicators. Spatial desegregation level of the information is the most critical point to solve as well as the lack of information for a lot of small-scale coastal fisheries, SSCF. The improvement of the SSCF knowledge can be achieved by self declaration methods (fishing activity records), questionnaires but also by technological approaches; GPS data can be obtained for example on a voluntary basis (see Recopesca project). Furthermore, specific monitoring plans can be implemented in order to produce indicators as an answer to a particular management goal, objective and corresponding actions. Integrate knowledge and know-how of users should not focus on fishing locations but can deal with ecological knowledge and fish behaviour (spawning aggregation, feeding grounds,…) and good practices. Standardisation of the methodology of data collection is necessary in order to allow comparison between MPAs. Data storage in a single or interoperated data management system is also a critical point as well as the dissemination and share of the information at the various levels of governance. For example, in the Natura 2000 context, risks assessment analysis are based on spatial and temporal overlap analysis of fishing activities (type and intensity) and habitats (type, fragility and resilience capacity, conservation priority). The Risk Management Process includes profiling of fishing activity, spatial conflict analysis and spatial management issues: the data needed would be provided by a densification of DCF methods and an improvement of the spatial desegregation. Some Member States are developing similar methodologies. Thus, these should be shared and harmonized at the European level.

Monday, November 9th, 09:30 – 9:45

Performance indicators for the Professor Luiz Saldanha Marine Park: a multi-criteria approach

Karim Erzini is an Associate Professor in the University of the Algarve. He made his Ph.D.(1990) in Biological Oceanography (University of Rhode Island). He was employed as a fisheries scientist at the Institut National des Peches Maritimes (Casablanca, Morocco) from 1981-1982, as a Research assistant at the Graduate School of Oceanography (RI, USA) from 1982-1990, and since 1990 has been a member of the faculty at the University of the Algarve, where he teaches Fisheries Technology, Stock assessment, Fisheries Modelling, Marine Population Biology and Fisheries Ecology at the graduate level, and Population dynamics at the undergraduate level. He is director of the Masters in Aquaculture and Fisheries and and *Erasmus Mundus* Masters in Marine Biodiversity and Conservation. He has supervised 10 PhD students (completed), with 6 ongoing, more than 30 MSc theses, and more than 70 undergraduate honors theses. Former director of the Centre of Marine Sciences of the Algarve (CCMAR), he is the leader of the Fisheries, Biodiversity and Conservation (FBC) group, with research interests focusing on the impacts of fishing, gear selectivity, recreational fishing, fish biology, ecology and population dynamics, fisheries management, habitat use, and marine protected areas. He has coordinated 8 international projects, 2 national projects, and participated in more than 20 other projects. He has approximately 100 publications in SCI journals and 6 book chapters /manuals.

PRESENTATION ABSTRACT

The Luíz Saldanha Marine Park, located in the central region of Portugal, with 38 km of coastline and an area of 53 km2, is a marine biodiversity hot spot. Established in 1998, specific management measures were implemented progressively starting in August 2005, with full implementation by August 2009. Three levels of protection were established: Total – no fishing activity of any kind allowed; Partial - some fishing activity allowed (octopus traps and jigging); Complementary - fishing allowed with vessels under 7m length and licensed to operate within the marine park (all vessels greater than 7m no longer allowed to fish). Given the existence of an important fishing port (Sesimbra) in the middle of the marine park and the fact that the area is extremely popular with recreational boaters, spear fishers, anglers and divers, the implementation of the different protection levels has been strongly contested by the different stakeholders. Since January 2007, the LIFE BIOMARES project has been monitoring the protection level effects, focusing on the abundance, biomass, sizes and community composition in the different protection level areas. We use a commercial fishing gear (trammel net) to monitor the soft bottom communities on a seasonal basis, at depths between 10 and 45 m. Trammel nets were selected for monitoring purposes based on our previous experience in other projects with the most common gears used in inshore areas (traps, longlines, gill nets and trammel nets), that showed that trammel nets have lowest species and size selectivity, catching the largest number of species and the widest size ranges. The individuals caught are identified to species level, measured to the nearest mm and released alive whenever possible. Taking into consideration the multiple objectives of the marine protected area, a variety of biological and economic indicators can be derived from the data, for each protection level. These include the mean size of different species, catch per unit effort (CPUE: in numbers and kg per 1000m of trammel net), standardized value of the catch (€ per 1000m of trammel net) and the presence and relative abundance of endangered or susceptible species such as skates, rays and sharks.

Monday, November 9th, 14:00 – 14:30

Assessing and valuation of non-extractive uses in MPAs

Michel Kaiser is a Professor of Marine Conservation Ecology at the School of Ocean Sciences, Bangor University (United Kingdom). His research focuses on how to achieve sustainable use of the marine environment in relation to fisheries and aquaculture. Michel was awarded the Fisheries Society of the British Isles (FSBI) medal in 2004 in recognition of the excellence of his contribution to fish and fisheries research. He currently chairs Defra's Marine Fisheries Stakeholder Forum and was appointed to the board of the Seafish Industry Authority in 2008 for whom he chairs the UK Scallop Group and the Common Language Group that promotes dialogue between fishers, NGOs, processors and retailers.

PRESENTATION ABSTRACT

The use of MPAs as management tools can have both positive and negative effects on stakeholders that utilize the specific area allocated to the MPA and the surrounding areas into which activities might be displaced. Positive benefits are associated with the long-term potential positive change in the status of the biodiversity and community structure within the MPA. Such changes can lead to spillover effects that might enhance adjacent fisheries. In addition, such areas may become more attractive to recreational users such as sport fishers, divers, wildlife tourists and others that lead to enhanced local economies. Such benefits (if they exist) are likely to occur in the medium to long-term. Negative outcomes of the imposition of MPAs are likely to occur in the short term due to the displacement of activities that generate revenue (e.g. fisheries). Displacement of such activities can have indirect effects on other adjacent areas if the level of activity is not controlled.

In order to assess the impacts of the responses of socio-economic activities in relation to the use of MPAs it is imperative to have data that quantifies the distribution and level of those activities in space and time. Using a variety of approaches, it is possible to obtain through stakeholder participation and using expert assessment, data that can be used to inform both the design process in relation to MPAs and that will provide a baseline against which to assess the impact of that management measure. A key consideration in this process is to consider the appropriate spatial scale at which to collect data such that it is meaningful and acceptable to stakeholders. At the very root of such processes it is important to have an understanding of the motives of stakeholders to participate (or not) in such management systems. Assessment of the discourse of stakeholders through time will reveal whether attitudes have altered such that they perhaps reflect a positive or negative experience of the management system.

Monday, November 9th, 14:30 – 14:45

Joint construction and appropriation of indicators by users, managers and scientists: the case study of recreational marine uses indicators in Chausey archipelago and Port-Cros national park

Eric Oulhen is the Coordinator of the Cellule Marine Syndicat Mixte Espaces Littoraux de la Manche (France). He has 15 years of technical experience on the management of different sectors of land and coastal areas. He has been a leader for Interreg and GIS projects.

PRESENTATION ABSTRACT

The Chausey archipelago is a small French Marine Protected Area. The *Conservatoire du Littoral* and the *SyMEL* have been marine managers of those 5000 ha of foreshore since 2007. According to management plan, the aims are: i) Improving scientific knowledge about relations between marine habitats and species; ii) Improving organisation of nautical uses (anchorage, sea farming, fishing area); and iii) Developing a sustainable management of marine resources (professional fishing, seashell farming, shellfish collecting).

Tourist frequenting is a major issue. A tool was expected to help stakeholders to share a point of view. GEOMER scientists were asked to fit an informative system able to monitor tourist frequenting and activities in the archipelago, including marine and terrestrial areas. This system, named BOUNT'ÎLES Chausey, is based on 3 sections: i) a handbook describing 18 collecting data protocols; ii) a database; and iii) 4 annual synthetic drafts dedicated to communication.

BOUNT'ÎLES Chausey is a long term monitoring, but after the 3rd year, managers and stakeholders are able to understand trends and to anticipate management responses. For example, Bount'Îles chausey has already contributed to develop information/control assessed campaigns for shell collecting activity. Bount'Îles chausey has also contributed to a nesting sterns disturbance study. Data collecting represent an important work for managers, and this will be evaluated at the 5th year. Today, communication drafts allow managers and stakeholders to understand the evolution of a complex situation of multi-leisure and multi-professional activities. This living image provides essential elements for discussions and for management choices.

RUNNING OF BOUNT'ÎLES CHAUSEY PROJECT.

Solenn Le Berre has made a summary especially for this proceeding, about the work of Géomer LETG – UMR 6554 in Chausey (2010-2012) done in the MAIA framework. Géomer is the scientist group responsible of the Bount'iles Chausey project.

Low-tide fishing (on foot) has always been a common activity among coastal populations. On the Chausey Islands (in the English Channel) the tides multiply the effective area of the archipelago by 70. This "expansion" of the island surface area provides access to numerous resources much sought-after by low-tide fishing enthusiasts. Today, the matter of managing the foreshores is a priority concern requiring accurate data to characterize these activities by acquiring knowledge of participants and their practices. A sustainable resource management policy should also be jointly developed.

Managers, users and residents of the Chausey archipelago have all expressed this need for data to support a management policy. Owing to its physical and biological characteristics and the challenges it represents, the archipelago is a particularly interesting study site in terms of:

- The extent and symbolic importance of low-tide fishing activities,

- The complexity of the social context, once one of conflict yet ever impassioned,
- The approach taken by managers in search of new concerted solutions.

Boasting approximately ten years of experiments and visitor monitoring in the archipelago, Géomer LETG is continuing research into island area management and visitor data through this original, multidisciplinary project focusing on interaction between fishing activities and bivalve beds, particularly clams, together with the CRESCO (centre for research and education on coastal systems) of the *Muséum National d'Histoire Naturelle* (national natural history museum).

This project is interesting for geographers on two counts. Firstly, it continues research on a promising, currently little studied scientific topic, and secondly it broadens thinking to embrace other disciplines by integrating questions concerning the biology of species, natural heritage conservation and professional activities.

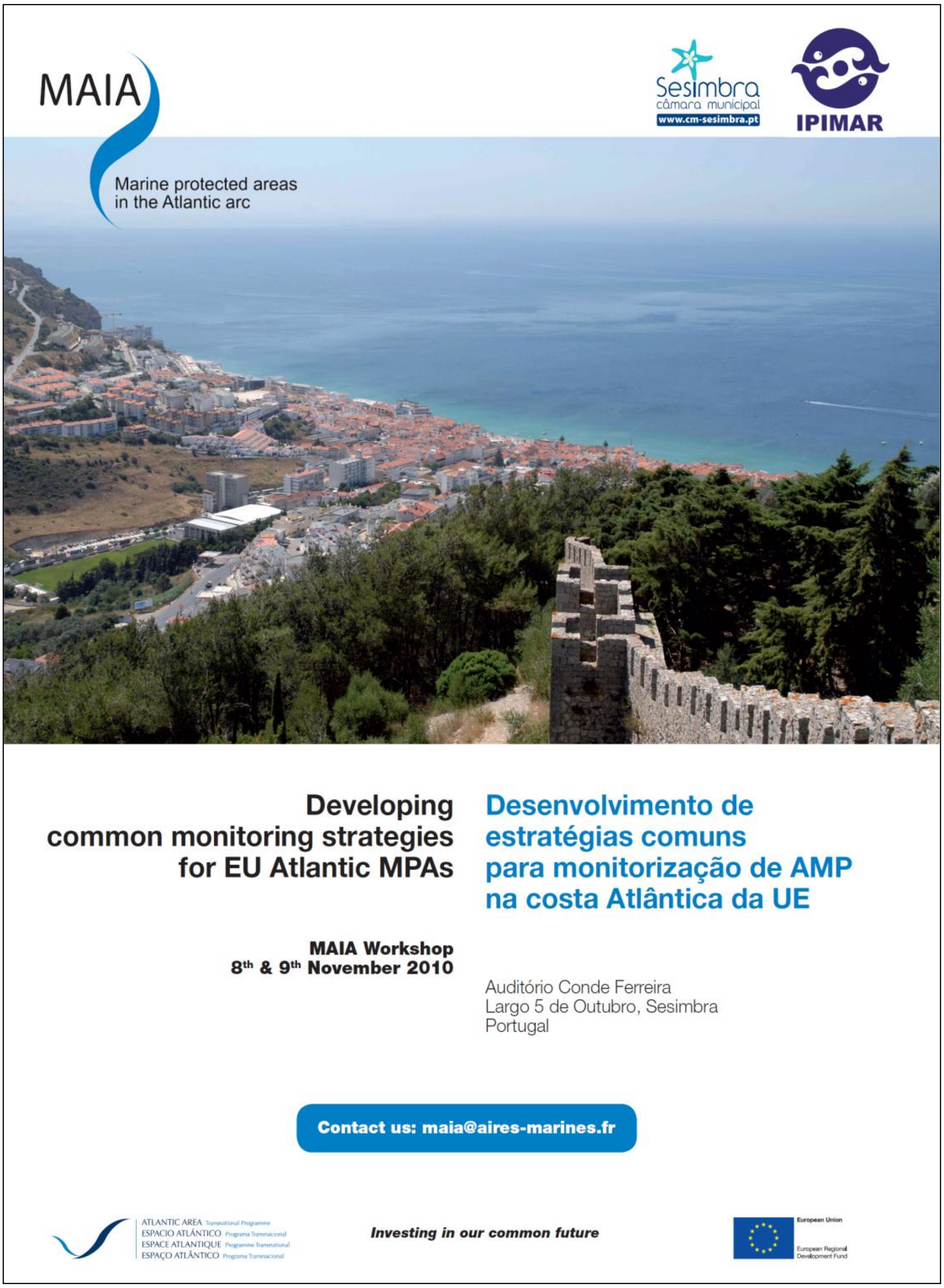
The foreshore visitor survey methodologies implemented for the MAIA project are based on approaches already developed, tested and validated during visitor surveys conducted in 1996-1997, then in 2003-2005, and in the Bountîles Chausey observation base set up in 2007. The scientific process is underpinned by three approaches aiming to characterize foreshore users and leisure practices: the first is quantitative and aims to provide figures by counts; the second is qualitative and fosters a sociological approach by conducting surveys; and the third is behavioural and provides insight into user attitudes.

The study is structured around eight key focuses:

1. Literature surveys on the topic of low-tide fishing, in terms of knowledge of practices, study methodologies, and social and environmental interactions.
2. Integrating both scientific questions on bivalve biology and management questions into social science study methodologies.
3. Continued monitoring of the Bountîles operational indicators, particularly quantitative indicators, and adjusting the processes applied to foreshore behaviour monitoring parameters.
4. Gathering new qualitative data through surveys on the foreshores during three spring tides (in summer, autumn and spring).
5. Leading and strengthening the "*carnets de pêche*" (logbook) network, an original initiative based on the voluntary participation of low-tide fishermen.
6. Perspective on the various data sources and the quantitative, qualitative and spatial processing thereof (statistic processing, discourse analysis, GIS and mapping).
7. Analysing results and characterizing low-tide fishing activities in Chausey and drafting a review.
8. The emergence of new foreshore visitor monitoring indicators and programming of processes in the Bountîles database.

Appendix

Poster MAIA workshop 8th and 9th November 2010



List of attendees

Name	Organization	Country
ALVAREZ FERNANDEZ, Inma	Universitu of A Coruña	ES
ANDRADE, Joana	SPEA	PT
ARNAIZ IBARRONDO, Ricardo	Xunta de Galicia - Consellería do Mar	ES
ASCHEHOUG, Solveig	CLPMEM-CC	FR
BARNAY, Anne-Sophie	Agence des aires marines protégées	FR
BATISTA, Marisa	CO-FCUL	PT
BERTHOU, Patrick	IFREMER	FR
BORGES, Rita	CCMAR	PT
CABRAL, Henrique	CO-FCUL	PT
CANTERI, Thierry	Agence des aires marines protégées	FR
CARNEIRO, Miguel	INRB, I.P. / IPIMAR	PT
CASELLE, Jennifer	University of California	USA
CASTRO, João J.	Universidade de Évora	PT
CRUZ, Teresa	Universidade de Évora	PT
DELAMARE, Aline	AGLIA	FR
DELAYAT, Stéphanie	CRPM Basse Normandie	FR
DUCLOY, Perrine	CNPMEM	FR
ERZINI, Karim	CCMAR	PT
EYNAUDI, Amandine	Agence des aires marines protégées	FR
FERNANDEZ MARQUEZ, Diana	University of A Coruña	ES
FREIRE BOTANA, Juan	University of A Coruña	ES
GARCIA-CHARTON, José Antonio	University of Murcia	ES
GASPAR, Miguel	IPIMAR	PT
GOLDING, Neil	JNCC	UK
GONÇALVES, Emanuel	ISPA – University Institute	PT
GONÇALVES, Jorge	CCMAR	PT
HENRIQUES, Miguel	ICNB	PT
HENRIQUES, Sofia	CO-FCUL	PT
HENRIQUES, Victor	IPIMAR	PT
HOOPER, Thomas	South West Food and Drink	UK
HORTA E COSTA, Barbara	ISPA/UAlg/Biomares	PT
JACINTO, David	Universidade de Évora / Centro de Oceanografia	PT
KAISER, Michel	Bangor University	UK

Name	Organization	Country
KHAYATI, Alice	AGLIA - CRPMEM Aquitaine	FR
LE BERRE Solenn	Université de Bretagne occidentale	FR
LECERF, Sophie	CRPMEM Bretagne	FR
LEGRAND, Véronique	CRPM Basse Normandie	FR
LINO, Pedro G.	INRB I.P. / IPIMAR	PT
MARRAS-AÏT RAZOUK, Phénia	Agence des aires marines protégées	FR
MARTINS, João	ICNB/PNA	PT
MARTINS, Rogélia	INRB / IPIMAR	PT
MCBREEN, Fionnuala	JNCC	UK
MUIÑO BOEDO, Ramon	University of A Coruña	ES
ORTEGA, Teresa	UNIVERSIDAD DE LA CORUÑA	ES
OULHEN, Eric	Syndicat Mixte Espaces Littoraux d ela Manche (SyMEL)	FR
PAIS, Miguel	CO-FCUL	PT
RIBO, Jorge	Xunta de Galicia - Consellería do Mar	ES
SÁ, Rita	Projecto MARGov	PT
SANDERSON, Bill	Heriot Watt University on behalf of JNCC	UK
SANTOS, Miguel Neves	IPIMAR	PT
SILVA, Flávia	MARGOV	PT
SILVA, Teresa	Laboratório de Ciências do Mar da Universidade de Évora	PT
SOUSA, Inês	CCMAR	PT
THIEBAUT, Eric	Station Biologique de Roscoff	FR
Mendes, Marina	CCMAR	PT
Cogica, Tiago	Conseil municipal Sesimbra	PT
Rodrigues, Sandra	CCMAR	PT
Numes, Manuela	LENB	PT
Cardoso, Sonia	ISPA	PT
Leonardo, Terere	INCB	PT
Reis, Rita	ISA	PT

Additional information

This international workshop was hosted by IPIMAR (PT) within the framework of MAIA – European cooperation project.

Conference topics: Miguel Neves dos Santos, INRB I.P. / IPIMAR, mnsantos@ipimar.pt

About MAIA project: Amandine Eynaudi, MAIA technical coordinator, maia@aires-marines.fr

Conference registration: Phénia Marras-Aït Razouk, MAIA administrative coordination, maia@aires-marines.fr

MAIA

Marine protected areas
in the Atlantic arc

Desenvolver uma rede de áreas marinhas protegidas no arco atlântico

O projecto de cooperação europeia MAIA tem como objectivo a constituição de uma **rede de gestores e utentes** de AMP. Esta rede desenvolverá diversas iniciativas a nível internacional em matérias de designação, governância e gestão. O objectivo genérico é o desenvolvimento de uma **rede de áreas marinhas protegidas** que seja representativa, coerente, eficaz e aceite no Arco Atlântico.

MAIA está organizado em 4 grupos de trabalho técnico:

- *Estado-da-arte*
- *Estratégias comuns de monitorização*
- *Medidas e plano de gestão*
- *Participação dos utentes*

MAIA junta nove parceiros **implicados na criação e gestão de áreas marinhas protegidas**, procedentes de quatro países: Reino-Unido, França, Espanha e Portugal.

A Agência francesa das áreas marinhas protegidas, enquanto líder, assegura a coordenação global do projeto.

O plano de acção 2010 – 2012

Workshops técnicos sobre problemáticas de gestão comum às áreas marinhas protegidas do arco atlântico.

Visitas a territórios dos países parceiros que têm como objectivo a partilha de conhecimentos.

Análises transversais para comparar as situações às áreas marinhas protegidas do arco atlântico.

Estudos no terreno desenvolvidos pelos sócios que alimentam as trocas dentro da rede.

Um sítio na web dedicado ao assunto que integre um espaço de colaboração reservado, uma base de documentação e uma base de dados SIG que estabelecerá um ponto de referência quanto ao estado às áreas marinhas protegidas do arco atlântico.

Elaboração e difusão de informação documental.

Towards an Atlantic network of Marine Protected Areas

The purpose of the European Marine Protected Areas in the Atlantic arc (MAIA) project is to create a **network of MPA managers and stakeholders**, who will take initiatives on an international level in terms of designation, governance and management. It aims to enhance the **development of a consistent, efficient and accepted MPAs network** in the Atlantic arc.

MAIA is structured in 4 main technical lines of work:

- *State-of-play of the existing MPAs*
- *Setting up common monitoring strategies*
- *Implementing management plans*
- *Involving stakeholders*

MAIA gathers 9 partners from 4 countries: United Kingdom, France, Spain and Portugal, **involved in MPAs designation and management.**

As lead partner, the French Marine Protected Areas Agency, coordinates the project implementation.

The 2010 – 2012 Action Plan

Organisation of technical workshops on common MPA management issues in the Atlantic arc.

Site visits in each partner country to enhance the sharing of information, knowledge and know-how.

Overview reports to compare MPAs' situation in the Atlantic arc.

Field studies to be carried out by MAIA partners, promoting the exchanges within the network.

Creation of a dedicated website, including a private collaborative space, a document database and a GIS database used to establish a baseline on the status of MPAs in the Atlantic arc.

Production and dissemination of document resources.

www.maia-network.org

ATLANTIC AREA Transnational Programme
ESPACIO ATLÁNTICO Programa Transnacional
ESPACE ATLANTIQUE Programme Transnational
ESPAÇO ATLÂNTICO Programa Transnacional

European Union

European Regional Development Fund

INVESTING IN OUR COMMON FUTURE