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Transversal Workshop on Spatial Based Approach to Fishery Management

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Provisional list of abstracts

Fisheries management/conservation and step-relief areas in the Mediterranean open seas, including deep seas

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Marine ecosystems in Mediterranean high seas are poorly known in relation to coastal and continental shelves. These ecosystems are currently threaten by fishing activities, including the vulnerable associations of sessile organisms, such as cold coral reefs, mostly detected in continental slopes, seamounts and on the walls of submarine canyons. Many geological features are also vulnerable to fishing as hotspots of diversity and as habitat of vulnerable fauna, like cold seeps, hydrothermal vents and submarine canyons. Essential habitats for pelagic species are mostly determined by oceanographic features like upwelling areas that create productive areas, and we highlight spawning areas and migratory routes of the overexploited bluefin tuna, swordfish, and albacore, that are of high conservation interest. This work aims to compile knowledge about vulnerable habitats in Mediterranean high seas that deserve special protection. We propose that in a context of difficult management of fisheries in Mediterranean high seas, these vulnerable habitats should be protected through establishment a web of Marine Protected Areas.

GRID (GeoReference Interactions Database): developing a tool to support the Integrated Management of the Coastal Zone

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In the framework of the European Project COEXIST a specific web based tool was developed to support the integration between acquacolture, fisheries and other activities in the Coastal zone. GRID (GeoReference Interactions Database) is a web-based GIS (GeoInformation System) tool to analyse interactions (conflicts and synergies) in marine coastal areas. Calculation of Conflict Scores, generation of Interaction Matrices, calculation of spatial overlaps between activities and generation of Asymmetric Matrices and calculation of Stress Levels associated to different scenarios are the main features designed and developed in GRID.

Artisanal fisheries and Marine Protected Areas in Italy: the case study of Torre Guaceto (SE Apulia) in the Mediterranean context

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The progressive degradation of marine ecosystems and the decline of marine living resources worldwide (due to a wide array of human impacts, including fishing) are nowadays a well accepted matter of fact. In the coastal areas of the Mediterranean Sea, most artisanal fisheries are suffering a dramatic crisis due to an overall overexploitation of fishing resources, increasing costs (e.g. fuel) and obsolete (and often inequitable) marketing of sea food. Marine Protected Areas (MPAs) have worldwide received in these decades an increasing attention not only as effective conservation tools (especially no-take reserves), but also as spatially-explicit scenarios where to experiment new approaches to enhance fisheries, in the path towards sustainability. Most of available studies at the moment are just theoretical and do not include usually the crucial 'human-dimensions' of fisheries. In SE Apulia, a study that involved the Torre Guaceto MPA management authority and the local community of artisanal fishermen started in 2005 and is still ongoing. The study was *de facto* an experiment of adaptive co-management of an artisanal fishery within the buffer zone of an MPA. The 'adaptive' component is related to the fact that fishermen accepted (on a voluntarily base) to be monitored by scientific personnel, in charge of setting the fishing effort year by year. The 'co-management' component is related to the fact that fishermen participated as peers in taking decisions (e.g. using selective gears, larger mesh size and shorter nets) and sharing the objectives (long-term sustainability). In short, this case study shows that: 1) fishing yields (i.e. throughout 6-7 years of study) remain 2-3 times higher in the buffer zone of the MPA than outside; 2) a competitive approach is going to be replaced by a cooperative approach among fishermen (avoiding the 'race to fish'); 3) fishermen are more and more aware that the MPA authority, police authorities, scientists and environmental associations (e.g. WWF, Slow Food) may help them and that staying isolated is not always convenient; 4) an international attention was paid to this case study, so that other fishermen through the Mediterranean look at the 'Torre Guaceto case' with interest, sometimes coming to visit their colleagues (that they consider much more reliable than any scientist or policy maker). Even though the 'nature' of fishermen is difficult to change, some steps further can be done, not only in a small fishing community like the one at Torre Guaceto, but also on larger fisheries and outside the borders of MPAs.

Marine Park Planning and Recreational Fishing: Is the Science Lost at Sea? Case Studies from Australia

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“No take” marine parks are widely advocated and increasingly utilised as a tool aimed at protecting marine biodiversity, and they may also be used as a fisheriesmanagement tool. In Australia a national system of no-take marine parks is being established to protect marine biodiversity.The creation of this network of no-take marine parks that exclude the public from recreational fishingin large areas of the ocean is extremely contentious. Nearly one quarter of the Australian population goes recreational fishingat least once a year, and it is a $2 billion industry. The motivations for, and aspirations of these recreational anglers are extremely diverse. While there is a clearly documented and accepted need to engage stakeholders through consultation and participation, there has been little focus in considering how the marine science associated with marine parks is communicated to, and interpreted by, recreational fishers. It is generally presented as value neutral information when in fact it can be demonstrated to frequently be value laden and the underlying values are increasingly incon sistent with many recreational fishers’observations of the natural environment which they interact with. The application of marine science in the context of marine parks has significantsocial and economic impact, and it is contested that these impacts are rarely understood clearly by most scientists active within the discipline, however views on them are offered that are frequently unchallenged by decision makers. In this paper, a number of Australian marine park case studies from urban and rural areas are used to examine identifiedcontentions in detail. Potential solutions to challenges and con tentions that have been encountered are presented.

Recherche et planification participative du secteur de la pêche artisanale à travers l'analyse systémique et prospective de durabilité dans la Zone Marine du Parc National d'Al Hoceima

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This study has contributed to establish an actual evaluation on the state of the marine resources conservation, we tried to touch a maximum shutters, socio-cultural, economic and ecological thematic. We tried also to complete the datas, directly relating to the artisan fisheries sector, and we established in a participative approach the sustainable indicators, then we linked relationships, during various workshops. The targeted groups were fishermen and the local population, as well as the administrative actors, coming from various horizons but concerned with the same territory, in this case the Marine zone National park of Al-Hoceima, Together we could to be aware, of the current state, and the changes in progress, the challenges and the risks related to the current trends. The Stakeholders were able to set goals according to a participative action plan in order to activate the zoning of the marine part of the ZMPNAH , then we adapted it to the needs of the current situation by choosing the priority and strategic actions, we hope to reach changes through a maximum of measurable results from our concrete and coordinate actions in order to guarantee an integrated management of the marine resources in the ZMPNAH.

Spatial management of fisheries in the Mediterranean region

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Spatial planning aims at reducing or avoiding user-user or user-environment conflicts whenever multiple uses of space and resources occur. Due to their complex nature and to the large number of activities and stakeholders involved, fisheries would definitely benefit from spatial management. Spatial approaches in fisheries management make use of a number of initiatives that span from marine protected areas and no-take zones to temporal or permanent single-gear restrictions. The complex nature of Mediterranean fisheries calls definitely for a spatial approach to their management. This paper reviews shortly the fishery restricted areas in the Mediterranean and their main effects on the abundance and size of commercial species, presenting case studies from France, Greece, Italy and Malta. The results are highly encouraging but more effort is needed in terms of enforcement, surveillance and monitoring.

GIS of Maritime juridiction and GFCM GSAs in the Mediterranean Sea

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The aim of the Geographical information System implemented is the collection in the same database of the official information on the jurisdiction of the Mediterranean Sea and the Task 1. The areas described in the layers concern:
- the maritime boundaries linked to the correspondent legislative reference as made available in the official website of UNCLOS (claims of territorial waters, contiguous zones, EPZ, etc.);
- the GSAs and the Task 1 available information;
- the areas of main IUCN interest.

As agreed during the SCSI sub-Committee, the GIS representing the Task 1 results (and the VMS data in the future) can be an useful tool to improve the data collection of GFCM Secretariat by the Countries.

Spanish marine reserves for fisheries, 25 years of history

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The Spanish Secretariat for fisheries is managing since 1986, marine reserves for fisheries enhancement in a network with now 10 marine reserves, 7 of which in the Mediterranean Sea. Good results from follow up show that the benefits go far beyond fisheries enhancement, as marine reserves show the public funds on protection measures and tools on the spot, contribute to biodiversity protection as well as knowledge on global change. Meanwhile marine reserves are too case studies for governance, good practices, precautionary approach and even marine spatial planing at a small scale.

Application of the ecosystem model ATLANTIS as a fisheries management tool in the Sicily Channel.

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Atlantis is an ecosystem box-model intended for use in management strategy evaluation. It has been applied to multiple marine systems (from single bays to millions of square kilometres) in Australia and the United States. Current work is being done on the construction and implementation of a version of the model for the Sicily Channel ecosystem and fisheries. At the core of Atlantis is a deterministic biophysical submodel that is spatially-resolved in three dimensions using a map made up of boxes and slab-like layers. This model tracks the nutrient (usually nitrogen and silica) flows through the main biological groups found in the marine ecosystem of interest. The primary ecological processes considered in the model are consumption, production, waste production and cycling, migration, predation, recruitment, habitat dependency, and mortality. Atlantis treats lower (invertebrate) trophic levels as biomass pools (though cephalopods and prawns may have some age structure), while the vertebrates are represented using an age- and stock-structured formulation (which tracks the condition of average individuals). The physical environment is also represented explicitly - via a set of polygons matched to the major geographical and bioregional features of the simulated marine system. Polygonal maps are used as they allow for the model to focus the spatial attention where needed, capturing the critical dynamics while still achieving computational efficiency. Atlantis also features a detailed exploitation model. This model deals with the impact of pollution, coastal development and broad-scale environmental change, but is focused on the detailed dynamics of fishing fleets. It allows for multiple fleets, each with its own characteristics (regarding gear selectivity, habitat association, targeting, effort allocation and management structures). At its most complex it includes explicit handling of economic drivers, compliance decisions, exploratory fishing and other complicated real world concerns (such as quota trading). The exploitation model interacts with the ecosystem, but also supplies ‘simulated data’ to a sampling and assessment submodel. The ‘data’ is fed into the same assessment models used in reality (including Surplus Production, Adapt VPA and Bayesian integrated assessments). In addition to these traditional assessment methods, a range of ecological indicators can be calculated (with an eye to their potential role in future ecosystem-based management schemes). The output of the assessment models are fed to the management model (typically a set of decision rules and management levers) for action. The management model in Atlantis is currently only detailed for the fisheries sector. For this sector it includes an extensive list of potential management levers (including gear restrictions, days at sea, quotas, spatial and temporal zoning, discarding restrictions, size limits, bycatch mitigation, and dynamic reference points).