

CIRCLE-MED call May 22th 2008

SUMMARY OF THE SELECTED PROJECTS

The following projects will be funded:

Project: ACIDBIV - The integrated impacts of marine acidification, temperature and precipitation changes on bivalve coastal biodiversity and fisheries: how to adapt

Project Leader (Country): Chicharo (Pt)
Partner (lead): CCMAR

Project: AQUIMED - Participatory design of adaptive groundwater management strategies and instruments in Mediterranean coastal water scarce areas as a response to climate change

Project Leader (Country): Faysse (Fr)
Partner (lead): CIRAD

Project: CANTICO - Climate and local ANthropogenic drivers and impacts for the Tunisian Coastal area

Project Leader (Country): Marcomini (It)
Partner (lead): Centro Euro-Mediterraneo per I Cambiamenti Climatici (Italy)

Project: CLIMWAT - Assessing and managing the impact of climate change on coastal groundwater resources and dependent ecosystems

Project Leader (Country): Ribeiro (Pt)
Partner (lead): CVRM (Portugal)

Project: INTERMED - The Impact of climate change on Mediterranean intertidal communities: Losses in coastal ecosystem integrity and services

Project Leader (Country): Sara (It)
Partner (lead): University of Palermo (Italy)



Project: Transitional Water Systems (MEDCODYN) - Climate change impacts in transitional water systems in the Mediterranean

Project Leader (Country): Rossi (It)

Partner (lead): Università di Sienna

Project: CLIMBIOMEDNET - Climate change influence on biodiversity, goods and services of Mediterranean lagoons

Project Leader (Country): Maillot (Fr)

Partner (lead): Université Montpellier

Project: Integrated Water Management in Coastal Drainage Basins - Integrated Water

Management in Coastal Drainage Basins: challenges and adaptation strategies within the framework of climate change

Project Leader (Country): Gabbianelli (It)

Partner (lead): CIRSA (Italy)

The following table shows the funding required for the different selected projects according to the involved teams.



Acronym of the Project	Project LEADER e-mail	Involved Institution 1 (lead)	Involved Institution 2	Involved Institution 3	Involved Institution 4	Involved Institution 5	Involved Institution 6	Total (€)
ACIDBIV	Chicharo (Pt) lchichar@ualg.pt	CCMAR (Pt) Centre of Marine Sciences of Algarve	CSIC (Sp) Consejo Superior de Investigaciones Cientificas (CSIC)	UNIPD (It) Department of Biology - University of Padova	Faculty of science of Bizerta (Tunisia)			199963
AQUIMED	Faysse (Fr) faysse@cirad.fr	CIRAD (France) Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement	Socius (Portugal) Research Centre on Economic Sociology and the Sociology of Organisations	BRGM (France) Bureau de Recherches Géologiques et Minières	Cemagref (France) Centre National du Machinisme Agricole, du Genie Rural, des Eaux et des Forets	ENA (Ecole Nationale d'Agriculture Morocco)		221033
CANTICO	Marcomini (It) marcom@unive.it and Francesca Santoro fsantoro@unive.it	Centro Euro-Mediterraneo per I Cambiamenti Climatici (Italy)	Météo France/CNRM (France) Centre National de Recherches Météorologiques	Institut National des Sciences et Technologies de la Mer (Tunisia)	Israel Oceanographic & Limnological Research (Israel)	INOSG (Italy) Istituto Nazionale di Oceanografia e Geofisica Sperimentale - OGS	CNRS/LMD (France) Centre National de la Recherche Scientifique /laboratoire de météorologie dynamique	215668
CLIMWAT	Ribeiro (Pt) luis.ribeiro@ist.utl.pt	CVRM (Portugal) CVRM/Geo-Systems Centre, Instituto Superior Técnico	Fundação da faculdade de Ciencias e Tecnologia	Universidad da Coruna (Spain)	Université des Sciences Semlalia (Morocco)			197771

			(Portugal)				
INTERMED	Sara (It) gsara@unipa.it	Animal Biology Department/University of Palermo (Italie)	Recanati Institute for maritime studies/ University of Haifa (Israel)	University of Dubrovnik Department of Aquaculture (Croatie) 20000€ self funding			135000
Transitional Water Systems (MEDCODYN)	Rossi (It) rossi@unisi.it	Dipartimento di Scienze e Tecnologie Chimiche e dei Biosistemi, Università degli Studi di Siena (Consorzio Interuniversitario per lo Sviluppo dei Sistemi a Grande Interfase) Università di Sienna (Italy)	Idrobiologia (Italy) Consiglio per la Ricerca e la Sperimentazione in Agricoltura Laboratorio Centrale di Idrobiologia	La tour du Valat (France)	University of Casablanca (Morocco) University Aïn Chock of Casablanca Biodiversity and Ecology of Aquatic Ecosystems		189864
CLIMBIOMEDNET	Maillot (Fr) mouillot@univ-montp2.fr	Université Montpellier (France) Laboratoire "Ecosystèmes Lagunaires", University of Montpellier II	Disteba (Italy) Dipartimento di Scienze e Tecnologie Biologiche ed Ambientali, Centro Ecotekne, University of Salento	Departamento de Ecología y Biología Animal facultad de Biología University of Vigo (Spain)	Tirana University (Albania) Department of Bio- technologies, Faculty of Natural Sciences of Tirana University	INA (Tunisia) Laboratoire Ecosystèmes et Ressources Aquatiques, Institut National Agronomique de Tunisie	200000

<p>Integrated Water Management in Coastal Drainage Basins</p>	<p>Gabbianelli (It) giovanni.gabbianelli@unibo.it</p>	<p>CIRSA (Italy) Alma Mater Studiorum Università di Bologna - C.I.R.S.A. Centro Interdipartimentale di Ricerca in Scienze Ambientali</p>	<p>Univers. Sciences et Technologies de Lille (France) Université des Sciences et Technologies de Lille – TVES EA 4019 (Territoire, Ville, Environnement sociétés)</p>	<p>GGCN (Portugal) Gabinete de Gestão e Conservação da Natureza do Departamento de Ciências Agrárias da Universidade dos Açores GGCN/DCA/UAC/PT</p>	<p>Ecole Nationale Forestière d'Ingénieurs (Marocco)</p>			<p>287102</p>
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Summaries of the selected projects

#1 ACID-BIV	
<u>Project # 1: ACIDBIV</u>	
<i>Total funding requested (Euros)</i>	199.963
CCMAR (P)	
CSIC (E)	
UNIPD (I)	
FSB (Tun)	
<p>Climate change and predictions of changes in air temperature and precipitation regimes will affect aquatic ecosystems functioning. Moreover, increasing atmospheric CO₂ concentrations will lead to the acidification of coastal waters in the Mediterranean area, as around the world, and the consequences to animals with calcium carbonate shells are expected. The predicted changes in environmental conditions (temperature, salinity, pH) may alter physiological rates of bivalves, modifying their impact (filtration, respiration, excretion rates) on the ecosystem. These impacts need to be evaluated in an integrative way. Bivalves play an important role on ecosystem structure functioning since they link primary productivity with upper trophic levels. Moreover, bivalve species to be studied in this project also constitute important economic resources for fisheries and aquaculture in Galicia, Algarve, Adriatic and Golf of Tunis coastal areas. With this project, our first aim is to analyse the cumulative effects of temperature, precipitation and pH, as predicted in climate changes scenarios, on the most relevant bivalve species for the study areas, both in terms of ecologic and economic importance. Based on this knowledge, our second aim is to propose adaptation measures to sustain bivalve biodiversity, fisheries and aquaculture production in the Mediterranean estuaries and coastal waters. For achieving these aims we structured the project considering a bottom-up approach: starting by selecting the most relevant species to be studied, defining testing and calibrating the methodologies to be used, developing laboratory experiments, testing these experiments with in situ mesocosms and finally, testing and proposing adaptation measures to sustain bivalve assemblages and related economic uses and contribute to CO₂ sequestration. The proposed solutions will be discussed with water managers, conservation and environmental areas responsible and with fisheries and aquacultures companies.</p>	



#2 AQUIMED

Project #2:AQUIMED

Total funding requested (Euros)

221.033

Cirad (F)

Socius (P)

BRGM (F)

Cemagref (F)

Ena (Ma)

Many Mediterranean coastal aquifers face quality and quantity water related problems, due to intensive water use. Climate change is likely to exacerbate the crisis, due to the combined effect of increases in crop water demands leading to increased pumping, reduced aquifer recharge, reduced surface water availability leading to increased groundwater use and increases in sea level. These different factors may result in decreasing water tables and saline water intrusion. In this context, new groundwater management practices have to be developed to prevent further degradation of groundwater resources.

The proposed **AQUIMED project aims** at addressing this challenge through the development of methods to support stakeholders' capacity to anticipate future changes and to identify and assess innovative groundwater management strategies and instruments. Such instruments will include institutional arrangements, economic and regulatory instruments and technical innovations aiming at improving water use efficiency in agriculture. The three coastal case studies are the Roussillon Aquifer in France, the Querença-Silves Aquifer in Portugal, and the Chaouia Aquifer in Morocco. In these aquifers, the high number of small-scale users leads to specific challenges in terms of user participation and groundwater management.

The work will have three main components. First, innovative participatory protocols will be designed taking into account participation difficulties, such as weak water user organizations. Second, scenarios of water resource and water use dynamics will be defined with stakeholders, based on general evolution drivers, climate change data and groundwater models. Desired long-term objectives will be defined based on these scenarios. Third, institutional, economic and technical instruments to manage groundwater resources and related uses will be defined, analysed and compared with stakeholders. Exchange networks between stakeholders and researchers from France, Portugal and North African countries will also be developed.

The project will enable local stakeholders' understanding of climate change potential impacts on groundwater resources, and of adequate instruments to ensure sustainable use of these resources. In that way, the project will enable to link up climate change models to local, stakeholder-built, adaptive management instruments.

#5 CANTICO

<i>Total funding requested (Euros)</i>	215.668
CMCC (I)	
Météo-France – CNRM (F)	
INSTM (Tun)	
IOLR (Is)	
OGS (I)	
CNRS – IPSL (F)	

The main objective is to develop a pilot study to establish a conceptual model tool to integrate the complex interaction of climate and anthropogenic impacts on vulnerable Mediterranean coastal areas. The effort will be aimed at identifying a convenient approach to prioritize risks and impacts thus supporting decision makers to define sustainable Integrated Coastal Zone Management (ICZM) procedures. The Gulf of Gabes area (Tunisia) has been chosen as a case study for a concrete pilot application for the development of such methodologies/tools.

The specific objectives are to:

- Develop the conceptual framework to simulate local effects of atmospheric climate change scenarios;
- set up a downscaling set of numerical tools for the Gulf of Gabes in order to simulate the coastal dynamics, capable to be nested with larger scale, already existing models;
- insert local anthropogenic forcings in the climate change scenario simulations for the coastal area;
- provide a sound and feasible methodology for the prioritization of risks and impacts posed by the combination of climate and anthropogenic impacts on coastal areas;
- provide some preliminary indications useful for the adoption of appropriate adaptation and ICZM options.

The effort will be based upon a multidisciplinary approach, gaining new knowledge by integrating existing tools. Results will take into account the needs of stakeholders and decision makers and will be translated in a form familiar to them.

CANTICO develops a methodology of wide applicability for regional planning in a climate change perspective and it is expected that the project participants will find numerous opportunities to apply these tools and findings in future projects or in supporting stakeholders and institutions. The most natural outcome would be the definition of a more comprehensive project under the CIRCLE ERA-NET. Other opportunities may come from the current EU 7FP funding scheme but also from the application of the project approach and results in favour of vulnerable coastal areas.

In addition, *the results will be exploited through networking with other national or international research institutions and projects.*

The project consortium brings together 6 partners from 4 countries and the activities are subdivided into 5 work-packages. The total project duration is 2 years.

8 CLIMWAT

Total funding requested (Euros) 197.771

Detailed funding requested per institution (Euros)

CVRM/Geo Systems Centre, Instituto Superior Technico (P)

Fundação de Faculdade de Ciências e Tecnologia,

Departamento de Ciências e Engenharia do Ambiente (P)

Depto. de Technoloxia da Construcion da Coruña (E)

Faculté des Sciences Semlalia, Université Cadi Ayyad (Ma)

The ecological and socio-economic role of groundwater in semi-arid Mediterranean regions is extremely important, particularly due to the extreme temporal and spatial variability in rainfall. Whereas the population often highly depends on groundwater resources, coastal wetlands are sensitive ecosystems that often depend on groundwater as well. The sustainable groundwater management that incorporates ecological demands is therefore a crucial though complicated task. **The two main objectives** of the current project proposal are: (i) to apply a joint methodology, integrating hydrogeological, hydrogeochemical and bio-indicator techniques, to identify and monitor the stress of groundwater resources in coastal regions, caused by overexploitation and climate change, resulting in their depletion and quality deterioration, thereby impacting on associated ecotones and groundwater dependent ecosystems; (ii) to develop several tools to be integrated into a sustainable groundwater management system that incorporates ecological demands, including: climate models that predict the impact of climate change on surface and groundwater resources; groundwater flow and transport models that incorporate sustainable yield and further permit the simulation of the impact of various climate and groundwater extraction scenarios on the evolution of the fresh-saltwater interface; hydrogeochemical models that simulate the processes that occur at fresh/saltwater interface and the evolution of groundwater quality in the aquifer under influence of natural and anthropogenic processes. The project will therefore develop a multi-model framework to support a groundwater resource management system, taking into account the present-day and future climate variability (e.g. long-lasting droughts), the risk of seawater intrusion and the ecological demand of wetlands that depend on groundwater. *The developed tools will be made available to the main stakeholders, including decision-makers on groundwater management and ecosystem conservation.* The applicability and reliability of the models will be demonstrated in several publications and a two-day workshop at the end of the project.

#11 INTERMED

Project #11: INTERMED

<i>Total funding requested (Euros)</i>	<i>135.000</i>
Animal Biology Dept., University of Palermo (I)	
Recanati Institute for Maritime Studies, University of Haifa (Is)	
Dept of Aquaculture, University of Dubrovnik (Cr)	

Intertidal ecosystems are defined as the benthic marine environments between the high and low tide lines along the coasts. These systems provide extensive ecosystem services and goods, sustaining the well-being and economy of coastal populations throughout the world. In the Mediterranean area, more than 90% of human populations live in the coastal zone and rely on intertidal resources (e.g., fisheries, salterns, tourism, mining of sediments, harbours, etc.). Despite their evident importance and conservation measures (e.g. Marine Protected Areas) to protect coastal areas, intertidal systems are threatened by various human activities, and in particular by climate change.

The general understanding of climate change assumes that increased temperatures will affect marine biodiversity on a large scale. Intertidal organisms cope with severe conditions (hydrological regime, aridity-dryness, food availability) on a daily basis, so in addition to dealing with extreme physical features that will accompany climate change, these organisms may have to face new challenges such as increased competition with invasive species. These environmental pressures are likely to lead to altered community compositions and habitat loss, reduced productivity and ecosystem quality, and eventually to loss in ecosystem services and goods for human economy.

The present proposal will examine the relationship between climate-change driven temperature increases in the Mediterranean Sea and the direct response by intertidal organisms and communities. This will be achieved through a meta-analytical literature review, simulated scenarios, experimental testing of hypotheses and development of managerial strategies. The experimental part of the project will involve both field and laboratory research, including mesocosm experiments. In addition to basic and applied ecological research on the intertidal zone, this project will examine public attitudes toward climate change impacts and economic ramifications of climate change effects.

#13 TRANSITIONAL WATERS

Project #13: Trans W. Syst.

Total funding requested (Euros) 189.864

Dipt. Di Scienze e Tecnologie Chimiche e dei Bioistemi, Università di Siena (I)

Consiglio per la Ricerca e la Sperimentazione in Agricoltura LCI (I)

La Tour du Valat (F)

University Aïn Chock of Casablanca (Ma)

Within the Mediterranean, coastal areas and their natural resources have a strategic role in meeting the needs and aspirations of current and future populations. Proper functioning of coastal lakes, wetlands, estuaries and lagoons is fundamental for water resources (groundwater recharge, surface waters), food production (maintenance of fisheries, bovine grazing and aquaculture) and biodiversity. An integrated approach is required to develop long term strategies which overcome present problems in coastal management, in particular: insufficient information about the combined effects of poorly regulated human activities (economic and non- economic) and climate change on ecosystem functioning and insufficient collaboration between scientific, administrative and policy levels. **In the present project, researchers from Italy, France and Morocco will collaborate to explore adaptation measures for three important coastal ecosystems**, working together over a 24 month period. The project will begin by synthesising available information in an information database on coastal water body dynamics in the Mediterranean (workpackage 1). Scientists will then utilise models and indicators developed in recent research to assess the vulnerability of the study ecosystems to climate change (workpackage 2). These instruments will incorporate the objectives of regional and EU strategies, including the European Integrated Coastal Zones initiative, Water Framework Directive, and the Habitat Directive. Adaptive measures will be examined, evaluated, prioritised and integrated into a broad plan of action that takes advantage of expected changes in climate and ecosystem resource use. The resulting adaptation strategy (workpackage 3) will integrate the adaptation measures, each evaluated separately as well as together, according to their effectiveness to meet specific objectives of short and long term management of the quality and quantity of these resources/services.

#7 CLIMBIOMEDNET

Project #7: CLIMBIOMEDNET

Total funding requested (Euros)

200.000

Laboratoire "Ecosystèmes lagunaires", University of Montpellier (F)

DiSTeBA University of Salento (I)

Dep. De Ecologia y Biologia Animal University of Vigo (E)

Dept. Of Bio-technologies, Tirana University (Alb)

Lab. Ecosystèmes et Ressources Aquatiques, INA (Tu)

This project involves 5 partners, three from contributing countries, Italy, France and Spain (Galicia), and two from other Mediterranean countries, that will be considered as subcontractors, Albania and Tunisia, respectively from Italy and France. The duration of the project is of 24 months. All partners are Public entities with strong skills in the ambit of transitional water biodiversity researches. The project fits very well with the needs of CIRCLE topic 1. Adaptation Strategies in the Water Sector and Coastal Zones. Here, it is proposed a research project **to address directly the relationships between community and ecosystems properties of Mediterranean lagoon ecosystems and those temperature and salinity changes, which are going to be the immediate effects of climate changes on the environmental niche of Mediterranean lagoon ecosystems.**

The project has three main aims: (1) to contribute to reinforce the theoretical background linking climate changes to community and ecosystem level responses in Mediterranean lagoons; (2) to test the expected relationships with already existing data; (3) to develop experimental protocols to evaluate the actual influence of climate changes on the Mediterranean lagoon ecology, in comparison with human activity induced changes. The project is structured into three main actions, which reflect three main WPs. WP1 is Project coordination and management, the other WPs are: WP2 (Philosophy): Develop Dahlem-type workshops on the understanding of pure climate change influence on Mediterranean lagoon community and ecosystem ecology; WP3 (Organisation): Implement a Mediterranean data-base on the biodiversity of Mediterranean lagoons; particular attention will be given to phytoplankton and macrozoobenthos communities, fishery productivity and nursery areas changes. WP4 (Ecological Inference): Describe the existing relationships between temperature/salinity changes and structural and functional properties of Mediterranean lagoon ecosystems, using the space gradients as a proxy for the expected time gradient. WP3 and WP4 are supported by the conceptual models and scientific hypothesis developed as a result of WP2. Future exploitation of project results will be harmonization of biological indicators in transitional waters ecosystems, support in the implementation of Water Framework Directive and in ICZM at Mediterranean level.

#15 Integrated Water Management in Coastal Drainage Basins
Project #15: Integrated. Water. Management in Coastal D. Basins

Total funding requested (Euros)

287.102

Alma Mater Studiorum, Università di Bologna, CIRSA (I)
Université des Sciences et Technologies de Lille, TVES EA 4019 (F)
Depto de Ciencias Agrarias da Universidade dos Açores,
GGCN/DCA/UAC/PT (P)
Ecole nationale Forestières d'Ingénieurs (Ma)

Our research project is **focused on groundwater and surface water modelling and on integrated management of water resources with methodologies that consider: the effects of landuse change and crops on the parameters of the water budget; saltwater intrusion in surface water bodies and aquifers; change of coastal ecosystems; freshwater availability in the catchments during the year; integrated management with stakeholders involvement and the development of Decision Support Systems (DSS) based on GIS databases and making use of Data mining techniques.**

In summary, the methodology proposed for the project is the following:

1. Collection and analysis of data on uses and users of water resources in the basins chosen as test sites.
2. Development of SWOT analysis for the integrated management of water resources in the study area.
3. Development of a GIS database (following the INSPIRE guidelines) at the scale of the case study catchment basin. The GIS will be set up in order to link to a DSS system (based on the DPSIR framework) for water resources management in the tourism industry and in agriculture.
4. Development of spatial interaction models with land use and coastal use suitable to represent the relations between the economy, the technology, the environment and the law/regulations.
5. Development of models for freshwater budget within the catchment based on the following factors:
 - a) Choice of crops that most efficiently adapt to the yearly distribution of water available for agriculture within the catchment today and in a scenario of climate change.
 - b) Choice of crops that take the best advantage of soil characteristics and water scarcity constraints in the catchment.
 - c) Management of water discharge in the basins during the year in a way to maximize aquifers recharge and control saltwater intrusion.
6. Development of numerical models for saltwater intrusion in coastal aquifers within a scenario of sea level rise, progressive desertification, and climate change (within the same case study).
7. Development of integrated models for water management to be included within the decision support system (DSS) taking into account the stakeholders point of view.

The results of this project can be applied by the local administrator in Mediterranean countries to adapt water management strategies in coastal zones to increasing drought and desertification climate conditions.