



SIXTH FRAMEWORK PROGRAMME PRIORITY: ERA-NET  
Coordination of National and Regional Activities (ERA-NET scheme)



Proposal/Contract no.: 026058

CIRCLE CA  
Climate Impact Research Coordination for a Larger Europe

**Minutes**  
**CIRCLE-MED Call Kick-off Meeting**  
**Rome, Italy**  
**13-14 November 2008**

**Attendants:**

Giuliana Gasparri, Alessandro Baldacci, Markus Leitner, Lourenco Tiago Capela, Sergio Castellari, Eric Vindimian, Daniel Martin, Marie Mojaisky, Sergio Vallejo, Telmo Carvalho, Yeshayahu Bar-Or, Claudio Rapicetta, Claude Millier, Filipe D. Santos, Pierre Chevallier, Luis Chicharo, Nicolas Faysse, Francesca Santoro, Andrea Critto, Alberto Basset, Luis Ribeiro, Tibor Stigter, Gianluca Sara, Marco Antonellini, Eric Masson, Tomaz Ponce Dentinho, Claudio Rossi, Loïselle Steven, Vincent Hull

**Authors:**

Marie Mojaisky  
Markus Leitner  
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# 1 Agenda of Meeting

**Location: Rome / Italy, Ministry of Env. Land and Sea – via Cap. Bavastro, 174 – 7° floor – “Sala Europa”**

**Date: 13<sup>th</sup> -14<sup>th</sup> November 2008**

## AGENDA

Thursday, 13 <sup>th</sup> November 2008
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**9h30 IMELS welcomes 10'**

**Overview of CIRCLE (Markus Leitner ) 20'**

**CIRCLE MED Call**

**-objectives (Eric Vindimian) 10'**

**-organisation, procedures, contracts...( Daniel Martin) 10'**

**-Animation and valorisation of the MED programme (Marie Mojaisky) 15'**

**-Science in the selected proposals (SAB chairman/Felipe D. Santos) 10'**

**10h45 Break**

**11h15: PROJECT PRESENTATION**

**Chair: SAB Chairman (Filipe D. Santos)**

**Theme 1:** Water integrated coastal management (biology)

**CLIMBIOMEDNET (20' +10' for clarification questions)**

**INTERMED (20' +10' for clarification questions)**

**Transitional Water Systems (20' +10' for clarification questions)**

**Theme 2:** Water integrated coastal management (physico-chemistry)

**CANTICO (20' +10' for clarification questions)**

**13h15 Lunch**

**14h 30:**

**Chair: SAB vice chairman (Claude Millier)**

**OPEN DISCUSSION about these 4 projects (90')**

**Synergies, links, experimental campaigns, methodologies, coordination, agenda...**

**16h break**

**16h30: PROJECT PRESENTATION**

**Theme 3: Marine resources**

**ACIDBIV (20' +10' for clarification questions)**

**17h End of day 1**

<b>Friday, 14<sup>th</sup> November 2008</b>
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**9h30 : PROJECT PRESENTATION**

**Chair: SAB member (Pierre Chevallier)**

**Theme 4 : Water integrated management**

**AQUIMED (20' +10' for clarification questions)**

**CLIMWAT (20' +10' for clarification questions)**

**Integrated Water management in Coastal Drainage Basins (20' +10' for clarification questions)**

**11h Break**

**11h30 OPEN DISCUSSION about these projects and ACIDBIV (90')**

**Synergies, links, experimental campaigns, methodologies, coordination, agenda...**

**13h Concluding remarks**

**-SAB chairman (Filipe D. Santos)**

**-CSS chairman (Eric Vindimian)**

**13h30 end of the meeting**

## 2 Minutes

*Note that to simplify these minutes, only discussions after the project presentations are noted. Summaries of the projects are available in chapter 5 of this document and power point presentations are available for download at the CIRCLE website (<http://www.circle-era.net/research-calls/circle-med-call/circle-med-kick-off-meeting/>)*

**Thursday, 13<sup>th</sup> November 2008**

### **INTRODUCTION**

**Giuliana GASPARRINI** welcomed the participants of the Med Call Meeting in the name of the Italian Ministry of Environment.

**Eric VINDIMIAN** reminded the objectives of the CIRCLE-MED call. The objective of a common research activity/joint call in the Mediterranean is mainly to do research. The Mediterranean area is specific by its climate, environment social and economic issues and by its common history. It is important to cooperate within the EU, but also to link the EU with North African and Middle East countries. One single country cannot remain isolated, so there is the need to capture skills from others and work across borders. The water issue, and integrated coastal zone management issue highly integrates physical and social sciences. The French ministry for ecology manages scientific programmes with the objective to provide evidence to politicians, i.e. to support policy making. France is launching an important Mediterranean initiative on environmental research “Chantier Méditerranée” to share all research agendas.

In the CIRCLE MED call policy relevance and scientific excellence have been the project selection criteria. The coordination of the different projects within the Med group is very important and project leaders must discuss, compare, share experience and create synergies. It is important to think how the results will be given/presented to stakeholders (e.g. policy makers and local authorities), what specific statements will be delivered.

**Markus LEITNER**, the Coordinator of the CIRCLE ERA-Net, highlighted the major features of the CIRCLE project in the frame of which the CIRCLE-MED call was launched. CIRCLE is the umbrella for this group and aims at supporting the creation of an European Research Area (ERA) (see *Power Point presentation*).

**Daniel MARTIN** gave a short historical review of the CIRCLE MED call. (see *Power Point presentation*). The call first criteria were scientific excellence with relevance for policy makers. Among 16 proposals, 8 were selected for € 1,65 million. Time was necessary to get through the different national funding mechanisms. In all participating countries (France, Galicia (Spain), Israel, Italy, Portugal) the funding to the projects is given in 3 tranches (at the start, midterm (with midterm report), and after final report), with some minor differences.

**Discussion:** All countries request reports, as a needed proof that the results are available, however these reports need also to be in an understandable form to be presented and taken into

account by politicians. The format of these reports could be a copy of the publications (in English) and a short executive summary (5-10 pages, in the national language and in English) which include messages and recommendations. A standard format for the executive summary to policy makers could be made available by the funders/Verseau.

**Marie MOJAĪSKY** and **Sergio VALLEJO** presented a proposal for the coordination of CIRCLE MED projects (see *Power point presentations*). The Association - VERSeau Développement - is subcontracted to the French ministry for Ecology to ensure the coordination unit of the CIRCLE MED call. It will support both projects and policy-makers to ensure a smooth transfer of relevant information. A major tool will be the CIRCLE MED website (integrated into the CIRCLE website), which will provide space for information from each project as well as common resources space. VERSeau will also prepare newsletters, eventually a couple of thematic workshops, and non specialized summaries. Inputs from the projects teams are absolutely essential for an efficient coordination. The projects will be requested to update their information at least each 3 months, which should be enough for an overall regular monitoring of the progress.

**Filipe D. SANTOS** Chairman of the Scientific Advisory Board, reminded the growing importance of climate change issues on the political agendas. Coastal zones are complex systems and to evaluate impacts of climate change is very difficult. Possible scientific challenges of the CIRCLE MED projects are:

1. Identify clearly what climate change signals are, especially separate them from other sources of pressure (man induced) on coastal zones;
2. Adaptation is a very local activity, which requires the involvement of stakeholders and
3. Climate change scenarios uncertainties (e.g. upwelling, sea level rise...) need to be integrated and the models used for downscaling need to be based on up to date data. The timeframe issues are important.

Scientific publications as results of the project are very important and will be a key to the evaluation and success of the projects.

Indicators are very important elements for the dialogue between science and policy makers, as it helps quantifying the impacts of climate change.

### Theme 1: Water integrated coastal management (biology)

- o **CLIM.BIO.MED.NET** (Climate change influence on biodiversity, goods and services of Mediterranean lagoons), presented by **Alberto BASSET** (see *power point presentation*)

The kick off meeting will take place on January 7-8, 2009, in Montpellier. The project will carry on three Dahlem type workshops<sup>1</sup> (first on April 14-18 in Vigo) and invites other interested projects to participate.

<sup>1</sup> The aim of the Dahlem Workshops is to foster scientific creativity, the exchange of information and ideas between different fields, and the development of new theses on the basis of well-founded research. See <http://www.fu-berlin.de/veranstaltungen/dahlemkonferenzen/en/index.html>

Discussion: The EC Water Framework Directive is insufficient concerning transitional waters. The good ecological status reference is an interesting issue, especially with regard to climate change, changing the reference conditions. This will be a discussion point of a Dahlem type workshop.

There will be no monitoring during the project, but studying of relationships between abiotic (T°, salinity and O<sub>2</sub>) and biotic aspects.

Many projects will establish and use databases, exchange information between each other and should be supported when possible (using the same queries, report format and reporting tools?).

- **INTERMED** (The impact of climate change on Mediterranean intertidal communities: losses in coastal ecosystem integrity and services), presented by **Gianluca SARA** (see *power point presentation*)

The project website will be at : [www.unipa.it/intermed](http://www.unipa.it/intermed). An international workshop will take place in Palermo on March 9-10, 2009 to debate and review case studies on physiology, energetics and behavioural ecology of intertidal ecosystems, technical and analytical procedures, climate change-driven impacts and socio-economical implications.

Discussion: Challenge to use data from biological simulation to quantify real costs for social aspects, and to produce socio-economic indicators.

Is it possible that climate change will induce not loss but gains in specific cases? This is the issue of invasive species.

- **MEDCODYN** (Climate change impacts in **Transitional Water Systems** in the Mediterranean), presented by **Steven LOISELLE** (see *power point presentation*)

Possibly the kick-off meeting will be held jointly with CLIMBIOMEDNET in Montpellier (6-7 Jan. 2009).

Discussion: Importance of stakeholders in the project, and difference of perception of vulnerability between scientists and other stakeholders. Scenario workshops and SWOT analysis will be used with stakeholders. Francesca SANTORO (CANTICO) proposes support/cooperation for scenario developments.

## Theme 2: Water integrated coastal management (physico-chemistry)

- **CANTICO** (Climate an local anthropogenic drivers and impacts for the Tunisian coastal areas), presented by **Francesca SANTORO** (see *power point presentation*)

A kick off meeting is planned for next January in Tunisia

Discussion: Management and coordination: CANTICO integrates 6 different teams with different origins, however the partners of the project have a long history of collaboration. North Adriatique experience will be used in this project. For the management a website will be developed, and progress will be monitored.

It will be decided in the first phase of the project, whether ground water will be taken into account.

The stakeholders will be involved through a Stakeholders analysis, questionnaires and workshops.

There is a problem concerning the lack of data in the studies area, however it is expected that existing data from other projects will be used (CIRCE<sup>2</sup>).

## OPEN DISCUSSION

Issues to discuss

1. Imagining solution to integrate social and economic sciences
2. Common information
3. Can CIRCLE MED create links to interlink the funded projects

The IPCC **climatic scenarios** integrate socio-economic development scenarios. It would be interesting to have the projects use the same regional scenario (or at least similar family, such as A1B intermediate). Downscaling from macro-economic based scenarios is quite difficult. The question - how to apply these scenarios to a national or local level - remains. Maybe the projects can create a milestone in this aspect toward more local scenarios. For local perspectives the existing most relevant local development scenario could be used. Trend scenarios (from measured data) have a shorter timeframe perspective. **CIRCLE MED website should have a section on scenario discussion.** Sergio CASTELLI proposes to send a mail exchange answering or precisating scenario needs as it is important to know requirements of each project-coordinator concerning the scenarios to be adopted.

**Sharing facilities:** information between projects on available or needed facilities (i.e. equipment, databanks, models or other tools) could be exchanged through a **special section on the web site.**

As the team leader of ACIDBIV project arrived only on the 14<sup>th</sup> Nov., a slight change in the programme occurred; theme 3 was postponed to the next day.

### Theme 4 : Water integrated management

- o **WATERKNOW – (Integrated Water management in Coastal Drainage Basins: challenges and adaptation within the framework of climate change)** presented by **Marco ANTONELLI** (see Power point presentation)

Discussion: It would be important to identify the climate change signal from other pressures/signals. Climate change will be mainly identified in the project through a change in the distribution of precipitations, but economic scenarios need to be integrated. The type of groundwater model to be used was discussed. Concerning the evaluation of the DSS (Decision Support System), it can be done by the end users. This is why they need to be implicated into the project at early stage, so that it fits their (stakeholder) end-user needs.

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<sup>2</sup> <http://www.circeproject.eu/>

## Friday, 14<sup>th</sup> November 2008

- **AQUIMED** (Participatory design of adaptive groundwater management strategies and instruments in Mediterranean coastal water scarce areas as a response to climate change) presented by **Nicolas FAYSSE** (see *Power point presentation*)

A kick off meeting took place already in Montpellier on Oct.18-20, 2008.

Discussion: What models will be used by the project for the runoff, climate change impact assessment, recharge of rivers? The project is less focused on modelling than on stakeholder participation. AQUIMED will work with CLIMWAT project for the models.

The connexions between power of money, and the stakeholders is difficult to control, but there are different indirect ways to limit water consumption (pumping) such as changing practices, crops...

The three case study regions of the projects are different. For each scientific issue, there will be one article with the same questions for each of the three case studies, but the approach in each region will be adapted and different.

- **CLIMWAT** (Assessing and managing the impact of climate change on coastal groundwater resources and dependent ecosystems), presented by **Luis RIBEIRO** (see *Power point presentation*)

A kick off meeting is planned in Tunisia during the first week of December 2008.

### Discussion:

Question concerning species used for bioindicators, and links to Water Framework Directive. The project will use specific species that are present in ground waters, but not in freshwaters.

In the three sites of the case studies the geological conditions are different, what will be the models used? Identified specific models which exist already in the regions will be used, except for Morocco where a model similar to the one in Spain will be used.

How will climate change be linked to the bioindicators (especially to differentiate it from other pressures). The impacts will be evaluated in terms of water availability to species (quantity) and quality (physical and chemical variables to be analysed like nitrates). Also the impact of climate change in groundwater quality will be studied using carbonate dissolution indicator.

The SAB suggests that AQUIMED and CLIMWAT are complementary projects and that AQUIMED uses CLIMWAT scenarios for the interactions with their stakeholders. However a timing difficulty may appear as both projects develop in parallel. A suggestion was made also not to ignore environmental NGOs as stakeholders.

### Theme 3: Marine resources

- **ACIDBIV** (The integrated impacts of marine acidification, temperature and precipitation changes on bivalve coastal biodiversity and fisheries: how to adapt?) presented by **Luis CHICHARO** (see *power point presentation*)

### Discussion:

Other sources of acidification besides CO<sub>2</sub> from atmosphere were not considered (such as acidification from pollution).

The timeframe considered is 70 years.

The choice of the species was made according to the objective to evaluate economical impact of bivalve adaptation on fishing activity.

If the impact of the change of pH is confirmed, then the role of the T°C is also important and discharges from thermoelectric power plants will have impacts as well.

## **GENERAL DISCUSSION**

The first part of the discussion is dedicated to issues on how projects can work together with added value (synergies). Important keywords proposed for the discussion are: adaptation, indicators, stakeholders and policy makers, methodology, tools and facilities, scenarios, climate changes signal versus global, uncertainty (suggested by C.MILLIER)

Concerning facilities, a discussion took place considering regional facility centres or just sharing facilities between projects. The second solution seems the only feasible at this stage, provided national rules are being observed. A general protocol of intent for sharing facilities could be signed by each institution. It could be an important output of CIRCLE MED group.

Concerning scenarios, it is proposed to provide links to all available scenarios (climate and socio-economic) on the CIRCLE Med website.

Concerning exchanges between projects, common cross research questions could be put down for discussion to gather some common views from projects, such as how projects intend to use scenarios, etc.

The differentiation of CC versus global change is in some cases very difficult, especially from a biological perspective.

Discussion around the organisation of the mid term review of CIRCLE MED : could it be organised around keywords instead of by projects? The aim of the mid term review is to review progress in the questions addressed to the policy makers, and how to communicate it to them.

What is adaptation in terms of scientific problem? In some cases adaptation is build and then proposed to stakeholders, in other it is build together with stakeholders.

Different locations mean different values linked to stakeholders. The stakeholders' analysis should be used in all the projects.

Besides uncertainties used by IPCC, there are also uncertainties produced by the results of the research projects themselves. IPCC is a good reference, but the process is dynamic.

The second part of the discussion was dedicated to practical and organisation issues.

There are four types of actors:

- scientific projects
- Scientific Advisory Board (can support the projects and be contacted by them)
- Policy makers
- Coordinating unit (VERSeau), here to support both projects and policy makers

VERSeau will develop a website for CIRCLE MED, which will be integrated into the CIRCLE website. Projects will be asked to update their information every three months.

The website will provide information on:

1. Cartography of where we work
2. Inventory of the facilities used in the CIRCLE MED projects
3. Methodologies used by the projects, models, downscaling
4. Available scenarios
5. Questions addressed to policy makers by the projects (VERSeau to summarize)

A common format for the mid-term and final report format will be produced by the coordination unit. The midterm report will be required before the midterm seminar in November 2009 in Portugal.

A proposal to present CIRCLE MED at the Water Forum in Istanbul was made; however as it is not a scientific event and CIRCLE MED has no results yet it was not considered as being relevant. It would be relevant however to use the side events at UNFCCC meetings (COP 15) to have a 30 minutes presentation of project results at the end. CIRCLE will be presented at the next COP meeting in Copenhagen in December 2009.

### 3 List of participants

name	Organisation	e-mail
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## 4 Report from SAB

The Scientific Advisory Board (SAB) was represented by Filipe Santos, Pierre Chevallier and Claude Millier. The SAB chaired and moderated sessions with scientific presentations and open debates.

The 8 projects were introduced by their leaders (in general) rather briefly (20 minutes) and commented and clarified in a dialogue with the other participants. More general topics issued from the presentations were discussed in following debates. This organization was efficient for a kick off meeting.

The SAB obtained confirmations and precisions about remarks it made in January 2008, and observed that some of its remarks had been taken into account. Still some projects will need more attention during the life of the program because of some weaknesses or risks. In terms of monitoring, VERSeau proposed a three-month period for information update which will allow identifying problems as they occur, and the mid-term seminar will be very important.

Some teams were represented by more than one scientist but not all, and it is the leaders have the responsibility to disseminate the information from the meeting to their partners. We noted that nobody from the associated countries was present, which is a pity and has to be corrected for the mid-term meeting.

We note that two projects share a common pilot site and are obviously complementary in terms of representation of physical and social processes (CLIMWAT and AQUIMED) and that CANTICO, is an ambitious but rather risky project that require more precise project management and coordination.

From the discussions, some common questions emerged that are to be developed in the projects but also between projects

- taking explicitly into account climatic and socio-economic scenarios in the projects
- separating climatic and other origin changes, using local and global levels
- relating to adaptation strategies and consequently to stake holders
- dealing with indicators
- sharing methodologies , tools and facilities (from sites to modelling choices )

Regarding the first and last questions, the program management and coordination (Steering Committee, SAB, VERSeau) will provide clear information to projects: choice of scenarios, inventory of facilities.

The mid term seminar is an essential step as it will support coordinating pilot site works, common access to data bases, integration processes, exchanges between disciplines and more generally increasing scientific debates.

Already now we see the goals of the mid-term seminar are:

- to present the preliminary results
- to present some the first papers (published, submitted) and other elements of dissemination of the results
- to present and discuss the possible difficulties to be faced
- to present the advances and progress (or not) of the time table
- to give some views about the prospective of the project

Thus the presentations could follow the same format with an introduction showing the context. However there are suggestions to organize the planning around common issues (project presentations and programmed debates). In both cases additional 10 minutes would be necessary for the project presentations. To organize the debates, it is possible either to impulse discussions from the SAB or to give responsibilities to specific project leaders: short papers may introduce the questions and be put on the web site some weeks before the meeting.

In any case the mid term seminar is to be seen not as an evaluation process but a tool to help and support the research works.

In the SAB's opinion, the evaluation of this launching seminar is very positive either about getting information from the projects, increasing cohesion and coherence of the program through debates between scientists, but also between scientists and managers/advisors of the program, and creating confidence and informal links.

Italian organizers are to be deeply thanked for allowing the development of such processes.

## 5 Summaries of projects

### ACIDBIV

*Total funding requested: 199 963 Euros*

*Detailed funding requested per institution (Euros)*

CCMAR (P)	104 963
CSIC (E)	47 500
UNIPD (I)	47 500
FSB (Tun)	by CCMAR

Climate change and predictions of changes in air temperature and precipitation regimes will affect aquatic ecosystems functioning. Moreover, increasing atmospheric CO<sub>2</sub> 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 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 CO<sub>2</sub> sequestration. The proposed solutions will be discussed with water managers, conservation and environmental areas responsible and with fisheries and aquacultures companies.

## **AQUIMED**

*Total funding requested: 221 033 Euros*

*Detailed funding requested per institution (Euros)*

Cirad (F)	54 100
Socius (P)	70 000
BRGM (F)	35 553
Cemagref (F)	41 280
Ena (Ma)	20 100

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.

## **CANTICO**

*Total funding requested: 245 668 Euros*

*Detailed funding requested per institution (Euros)*

CMCC (I)	74 800
Météo-France – CNRM (F)	25 580
INSTM (Tun)	20 900
IOLR (Is)	20 220
OGS (I)	19 815
CNRS – IPSL (F)	54 353

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 of 2 years.

## **CLIMBIOMEDNET**

*Total funding requested: 200 000 Euros*

*Detailed funding requested per institution (Euros)*

Laboratoire "Ecosystèmes lagunaires", University of Montpellier (F)	65 000
DiSTeBA University of Salento (I)	42 500
Dep. De Ecologia y Biologia Animal University of Vigo (E)	42 500
Dept. Of Bio-technologies, Tirana University (Alb)	25 000
Lab. Ecosystèmes et Ressources Aquatiques, INA (Tu)	25 000

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 reflects 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.

## **CLIMWAT**

*Total funding requested: 197 771 Euros*

*Detailed funding requested per institution (Euros)*

CVRM/Geo Systems Centre, Instituto Superior Technico (P)	62 531
Fundação de Faculdade de Ciências e Tecnologia, Departamento de Ciências e Engenharia do Ambiente (P)	30 000
Depto. de Technoloxia da Construcion da Coruña (E)	60 240
Faculté des Sciences Semlalia, Université Cadi Ayyad (Ma)	45 000

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.

## **INTERMED**

*Total funding requested: 135 000 Euros*

*Detailed funding requested per institution (Euros)*

Animal Biology Dept., University of Palermo (I)	115 000
Recanati Institute for Maritime Studies, University of Haifa (Is)	20 000
Dept of Aquaculture, University of Dubrovnik (Cr)	0

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.

## **WATERKNOW**

*Total funding requested: 287 102 Euros*

*Detailed funding requested per institution (Euros)*

Alma Mater Studiorum, Università di Bologna, CIRSA (I)	150 000
Université des Sciences et Technologies de Lille, TVES EA 4019 (F)	56 902
Depto de Ciencias Agrarias da Universidade dos Açores, GGCN/DCA/UAC/PT (P)	48 600
Ecole nationale Forestières d'Ingénieurs (Ma)	31 600

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. Collect 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 local administrator in Mediterranean countries to adapt water management strategies in coastal zones to increasing drought and desertification climate conditions.

## **MEDCODYN**

*Total funding requested: 189 864 Euros*

*Detailed funding requested per institution (Euros)*

Dipt. Di Scienze e Technologie Chimiche e dei Bioistemi, Università di Siena (I)	66 096
Consiglio per la Ricerca e la Sperimentazione in Agricoltura LCI (I)	30 132
La Tour du Valat (F)	65 124
University Ain Chock of Casablanca (Ma)	28 512

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.