

CIRCLE is a European Networking project aiming at implementing a European Research Area (ERA) in the field of climate change and adaptation research. CIRCLE-MED is a geographical group in the frame of [CIRCLE ERA-Net](#), addressing issues of common interest to the Mediterranean countries. The first CIRCLE-MED joint research call is dedicated to **integrated coastal zone management and water management**.

In this issue...

In this Newsletter the objectives and activities of the projects ACIDBIV and CLIMBIOMEDNET are presented. Since the last newsletter the main CIRCLE-MED event was the midterm conference which is reported here. The issue also includes a short presentation of the EU project CIRCE.

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CIRCLE-MED Newsletter

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CIRCLE MED web site: www.circle-med.net



Filipe Duarte Santos.
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Editorial by Filipe Duarte Santos

CIRCLE-MED organized a midterm seminar in Lisbon on November 18 and 19 of last year for the presentation and discussion on the current progress of the eight projects that were financed.

It provided a good opportunity to exchange views and discuss methodologies in a group of researchers coming from different regions and disciplines, but with the common purpose of studying and addressing the challenges of climate change as regards integrated coastal zone management and water management in the Mediterranean.

At the end of the presentations there was an open discussion on the availability and accessibility of regional climate scenarios, databases, including physical and biological data as well as methodologies for stakeholder's participation, and on the way to optimize the dissemination of the CIRCLE-MED results within the scientific community, stakeholders and decision makers.

I was impressed by the quality of the research and by some strong research links that had been established between the north and south rims of the Mediterranean.

Three weeks after this seminar I was less optimistic at the COP 15 in Copenhagen. I did not expect that a full binding agreement would be reached there but the Conference was close to chaotic and with no credible roadmap or planning after the first few days.

I left Copenhagen further convinced that we should invest more on adaptation, particularly in regions and countries vulnerable to climate change, as is the case of the Mediterranean.

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

Partners: *Centro de Ciências do Mar do Algarve (CCMAR), Portugal, Dipartimento di Biologia - Università di Padova (UNDP), Italy; Consejo Superior de Investigaciones Científicas (CSIC), Spain ; Faculté des Sciences de Bizerte - (FSB), Tunisia*

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Anthropogenic emissions of carbon dioxide (CO₂) are changing the carbonate chemistry of seawater. When CO₂ dissolves it reacts with seawater, decreasing the availability of carbonate ions and increasing the concentration of hydrogen ion, thus lowering pH. This process of “**ocean acidification**” also reduces the formation and speeds up the breakdown of essential shell-forming carbonates. **Bivalves** play an important role on coastal ecosystems, because they link primary productivity with upper trophic levels. Some species are also considered important “ecosystem engineers”. In the Mediterranean region, bivalves represent important economic resources for **fisheries and aquaculture**. Increasing concentrations of CO₂ and the consequent climatic changes may, therefore, affect bivalve production and fisheries, and also impact on the role those organisms play in coastal ecosystems. Different stages of the life-cycle of these organisms are potentially affected in different ways. In the ACIDBIV project we study the cumulative effects of temperature, precipitation and pH, as predicted in climate changes scenarios, on the most relevant coastal bivalve species for the study areas, both in terms of ecologic and economic importance. The **detailed objectives** for the project are:

- Evaluate the interactive effects of ocean acidification, temperature and salinity on bivalve physiology, biochemical composition and shell structure, particularly on larval and juvenile phases;
- Develop an ecophysiological model for the response of bivalves under different combinations of temperature, salinity and pH values
- Propose general measures to sustain the ecological and economic role of bivalves in

coastal Mediterranean areas (eg. control water quality, bivalve fisheries and aquaculture)

Three species were selected to be included in the experimental and modeling work: the mussel *Mytilus galloprovincialis* and the clams *Chamelea gallina* and *Ruditapes decussatus*. The juvenile life-stages of *R. decussatus* and *M. galloprovincialis* are being studied in long-term experiments (weeks to months), to evaluate the effects of different levels of seawater acidification by CO₂ on the growth, composition and morphology of their shells. Preliminary results indicate there is no effect of acidification on the size or weight of these juvenile bivalves. In contrast, seawater pH does seem to have an effect on the clearance and ingestion rates as well as oxygen consumption and ammonium excretion rates. In order to disentangle the interactive effects of pH, temperature and salinity on bivalve physiology, short-term factorial experiments are being done with adult *M. galloprovincialis* and *C. gallina*. The first results suggest that the effect of pH on some immunological biomarkers is emphasized by elevated temperature and salinity.

The results of these experiments will be used as inputs to develop a model to evaluate physiological response of bivalves to the values of environmental variables tested. The model will also be used to estimate the impact on water quality caused by bivalves under different environmental conditions. The outputs of the experimental and modeling tasks of the project will be employed to support the selection of the most adequate adaptation measures for sustaining the ecological and socioeconomic roles of bivalves in coastal Mediterranean areas under different scenarios of climatic change, elevated CO₂ and seawater acidification.



ECOLAG
Laboratoire Ecosystèmes Lagunaires
UMR CNRS-IFREMER-UM2 IRD



Universidade de Vigo



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

Partners: *Laboratoire “Ecosystèmes lagunaires”, Univ. of Montpellier (France); Dip. Scienze e Tecnologia Biologiche ed Ambientali, Univ. of Salento (Italy); Dep. De Ecología y Biología Animal, Univ. of Vigo (Spain); Dept. of Bio-technologies, Tirana Univ. (Albania); Labo. Ecosystèmes et Ressources Aquatiques, INA (Tunisia)*
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The main objectives of the project are **to reinforce the theoretical background** linking climate change to biodiversity and ecosystem level responses in Mediterranean lagoons; **to explore** the **actual** relationships between biodiversity and environmental variables using existing data, and to **model** the **future** influences of climate changes on the Mediterranean lagoon ecology using (1) space as time and (2) projection according to scenarios (IPCC).

The project organized three **Dahlem-type workshops** on the theoretical understanding of climate change influence on community and ecosystem ecology and goods and services delivered by Mediterranean lagoons. The workshop concept is the systems approach to understanding, seeking innovation as an emergent property of different kinds of knowledge, identifying

gaps in knowledge, finding new ways in approaching controversial issues and defining priorities for research.

The project is also developing **an extensive and interactive database** gathering biotic and abiotic information on lagoons and their watersheds. Already 627 lagoons were digitized around the Mediterranean Sea, abiotic parameters, including chemical and physical properties of water and sediments were recorded, and lists of species were collected: 1387 taxa, pertaining to 787 genera.



Last, the project will be **developing statistical models** to link environmental variables and species occurrences in lagoons in order to project their future distributions and the potential erosion of biodiversity. The **space as time models** will model species composition and biodiversity of lagoons as a function of abiotic variables. The “space as time” notion refers to the assumption that current conditions in the south will probably occur in the north under climate change. The **species niches models** will model the niche of species in order to make projection about their future occurrences according to climate change scenarios



CIRCLE-MED Mid Term Seminar

The [CIRCLE-MED Mid Term seminar](#) took place in Lisbon, Portugal on November 18-19, 2009, preceded by a meeting of the Scientific Advisory Board. The seminar aim was to review the projects' progresses and share information between the projects' community to support possible synergies. As invited guests, experts from [CIRCE project](#) made a very interesting presentation on their project. Thanks to all participants and to our hosts from the Fundação para a Ciência e Tecnologia for this successful event.



CIRCE project

CIRCE is a large 4 years project, with 64 partners funded by the 6th EU framework programme, and ending in spring 2011. It studies the Mediterranean climate thanks to a multi-disciplinary scientific staff, including economy and social sciences to evaluate the best strategies of adaptation to the climate change in the Mediterranean.

The **CIRCE final product** will be the RACCM – Regional Assessment of Climate Change in the Mediterranean, produced together with **stakeholders**, as support system to the **adaptation and mitigation policies in the Mediterranean region**

More on: www.circeproject.eu

Calendar of Events

16-17 March 2010, Casablanca, Morocco: [Regional Meeting: Adaptation to Climate Change in the Maghreb: Review and Outlook](#)

28-31 March 2010, Montpellier, France: [The Global Conference on Agricultural Research for Development GCARD](#)

24-26 March 2010, Agadir, Morocco: [2nd International Conference Integrated Water Resources Management and Challenges of the Sustainable Development](#)

13 April 2010, Barcelona, Spain: [The Euro-Mediterranean Ministerial Conference on Water: Adoption of the Strategy for Water in the Mediterranean](#)

26-28 April 2010, Lille, France: [WFD Lille 2010 Conference: Integrated River Basin Management under the WFD Conference - Action Programmes and Adaptation to Climate Change in the context of the Water Framework Directive](#)

25-29 May, 2010, Ohrid, Macedonia Rep.: [Fourth International Scientific Conference: BALWOIS 2010 - Conference on Water Observation and Information System for Decision Support](#)

26-28 May, 2010, Lille, France: [5th International Conference on the "Water Resources in the Mediterranean Basin" \(WATMED5\)](#)