EEA 02 March 2016

**Climate-ADAPT „Research projects page submissions - Ongoing projects**

1. **Template Project descriptions**

Name of projects:

Abbreviation: RISES-AM-

Full name of the project: Responses to coastal climate change: Innovative Strategies for high End Scenarios -Adaptation and Mitigation-

Project logo:



The Challenge:

Describe the challenge in one paragraph. . Describe how your project addresses the specific issues/challenges in its respective field.

The obtained results are based on a set of models that consider global projections especially prepared for coastal systems to allow evaluating climate impacts for present adaptation levels. Next the adaptation deficit has been made explicit as a function of coastal archetype. The local scale analysis has addressed processes not often considered together, such as flooding, erosion and salinization. This can be illustrated by the distribution of salinity levels in one of our case studies (the Ebro Delta in the Spanish Mediterranean coast) where the effect of salinity on the main economic activity (rice fields) has been assessed and this has led to a preliminary determination of acceptable rates of sea level rise, considering that the delta is also subsiding so that the relative land-sea levels are rising at a rate higher than that normally associated to present conditions and comparable to that expected with accelerated climate change.

Project objectives:

Describe the project overall objective in one paragraph.

RISES-AM- working hypothesis is that coastal zone sustainability can be enhanced by adopting a flexible adaptive pathway that identifies tipping points and makes use of green intervention options, more sustainable than the traditional coastal engineering solutions. To achieve this general goal we are a) developing a set of adaptation pathways for our selected vulnerable coastal systems, introducing retreat and accommodation strategies and including local scale derived innovative solutions, b) assessing synergies between these options under a range of future scenarios, considering the physical and the socio-economic components, c) introducing a risk approach into climatic analysis to achieve a higher level of objectivity in the assessments and to account for uncertainties in drivers and responses. This will lead to a better assessment of the compatibility between local, regional and global scales and between short term and long term plans.

Methodology:

Describe the methodology in one or two paragraphs, bullet points may be included. Describe the general structure of the project tasks and methods employed.

RISES –AM- is based on a nested assessment approach across scales to determine vulnerability and risk. We shall start by comparing world regions and determining the main vulnerability hot spots as a function of coastal typology. This will be followed by regional refined analyses and local assessments, including the performance of novel types of “green” interventions.

The most efficient interventions will inform regional scale analysis where adaptation paths will be developed and classified, according to their contribution to climate mitigation. This will be next used to reassess an improved global scale analysis.

With this approach we are aiming at an enhanced natural functioning of “green” coastal interventions that will result in a more sustainable coastal system functioning under extreme climatic and socio-economic scenarios.

Expected results:

Describe the most relevant project results in max 1 page, link to a website where relevant results will be available online can be given (if available).

The results form RISES-AM- have been derived from our conceptual and numerical models that deal with impact projection for coastal systems and allow evaluating climate impacts for present adaptation levels. We have also considered the adaptation deficit as a function of coastal archetype. The local scale analysis has addressed processes not often considered together such as flooding erosion and salinization (e.g. salinity levels in one of our case studies the Ebro Delta in the Spanish Mediterranean coast). We have also assessed the regional vulnerabilities by characterizing coastal typologies along selected coastal stretches where we have projected future mean sea level, surges and wave conditions and combined them with space availability so as to determine adaptation levels and possible interventions and pathways. At the global scale we are also carrying out a similar assessment considering in a combined manner flooding and erosion and introducing for the first time retreat as an adaptation option. The results of our assessments show the importance of planning ahead in all categories to reduce climate change impacts and show the feedbacks between the physical and socio-economic sub-systems in the coastal zone. For this purpose we are considering interventions which are a combination of a) grey interventions based on rigid structures, b) green interventions based on natural principles and c) soft interventions based on sand nourishment and land planning. The direct economic effects have been estimated based on land availability while a number of analysis have been carried out to start calculating indirect effects (e.g. via sea transport responsible for more than 80% world trade). The benefits of adaptation and the need for flexibility to enhance coastal sustainability have been addressed using a process based analysis. We are showing how sustainability can be enhanced by providing additional sedimentary volumes supported by enhanced water fluxes. The role of natural habitats and ecosystem functioning has also been considered to promote energy friendly type of interventions so that natural accretion mechanisms, well known for wetlands, can be exported to other coastal systems. We are also considering the general suitability of non-conventional interventions such as rising land levels (e.g. Netherlands or Maldives) versus vegetation based approaches. This has allowed presenting new questions that were not so clearly identified before. For instance the concept of high-end conditions and whether that refers to pressures acting on a coastal system or to the combination of pressures, state and responses. The same regarding the need to combine average trends and extreme events so as to find the worst possible combination and assess from that coastal vulnerability. More information can be found on <http://www.risesam.eu/>.

Project partners:

List the institutions involved in the project and add the country name.

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| **Project Partners** |  |
| UNIVERSITAT POLITECNICA DE CATALUNYA | ES |
| INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE PENTRU GEOLOGIE SI GEOECOLOGIE MARINA-GEOECOMAR | RO |
| INSTITUT DE RECERCA I TECNOLOGIA AGROALIMENTARIES. | ES |
| UNIVERSITY OF SOUTHAMPTON | GB |
| STICHTING DELTARES | NL |
| CHRISTIAN-ALBRECHTS-UNIVERSITAET ZU KIEL | DE |
| NATURAL ENVIRONMENT RESEARCH COUNCIL | GB |
| HELMHOLTZ-ZENTRUM GEESTHACHT ZENTRUM FUR MATERIAL-UND KUSTENFORSCHUNG GMBH | DE |
| STICHTING VU-VUMC | NL |
| GCF - GLOBAL CLIMATE FORUM EV | DE |
| CENTRO EURO-MEDITERRANEO SUI CAMBIAMENTI CLIMATICI SCARL | IT |
| UNIVERSITY OF SUSSEX | GB |

1. **Template Facts:**

Funding instrument: EC Contribution / FP7 – Collaborative Project

Start Date: 01/11/2013

End date: 31/10/2016

Duration: Three (3) years

Project coordinator: UNIVERSITAT POLITECNICA DE CATALUNYA (UPC)

Project website: http://www.risesam.eu/

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