

# **"ADRICOSM INTEGRATED RIVER BASIN AND COAST MANAGEMENT SYSTEM: Montenegro coaSTal ARea and Bojana river catchment"**

**Funding :** Italian Ministry for the Environment, Land, and Sea

**Duration:** 3 years: December 2006 – December 2009 (the project has just been extended until June 2010)

**Coordinating Institution:** EuroMediterranean Center for Climate Change-CMCC, Lecce, Italy

**Partners:** CMCC (IT), SGI(IT), ENEA(IT), CNR-ISMAR(IT), OGS(IT), ISPRA(IT), HI-M (Montenegro), MBI-Kotor (Montenegro), CETI (Montenegro), IEWE (Albania), BU (Serbia), SEWA (Serbia)

## **General Description of the Project:**

### **General Objects of the Project:**

- Continue and further develop the ADRICOSM forecasting system for the Adriatic Sea and its coastal areas with particular emphasis for the Montenegro coastal area.
- Develop the high resolution non-hydrostatic meteorological modelling and the modelling of the surface water cycle;
- Design and partially implement a monitoring system for the surface water cycle, the river runoff and the coastal area of Montenegro
- Develop and validate modeling tools for the urban, surface, underground water and coastal currents in the Bojana river catchment and Montenegro coastal area, considering the transboundary nature of the system
- Produce IPCC climate change scenario impact studies for the next decades in connection with the water and sediment quality in the Bojana river and the Montenegro coastal area

## **General Description of the Project**

The project aims at the study of the water cycle of the Montenegro area at large, implement monitoring systems and modelling tools, and assess the impact of climate change on the water cycle and material transports of the area. This objective is particularly important since water resources are deemed to become scarcer in the next decades due to climate change, and pollution from local sources need to be managed and reduced. The specific environmental problems of interest are:

1. The coastal area and river basin water quality;
2. The complex surface and underground water system and its influence on the coastal area;
3. Sediment transport, sediment quality and distribution in the Bojana river and the coastal area;
4. Management of the water resources and the water-ways (in particular the Bojana river) in climate change scenarios.

The project analyzes four environmental compartments:

- atmosphere-climate, in particular for the large Montenegro atmospheric area;
- oceanography, for the Montenegro and Albanian coastal areas;
- hydrology, for the Bojana river and the Delta area with consideration of the Albanian affluent;
- urban waters, for the town of Ulcinj.

Each compartment is being explored via an observational and modelling program that at the end will produce a monitoring and forecasting system for the urban and non-urban waters impinging in the coastal area and the coastal currents. Particular effort is being put into the monitoring and modelling of the atmospheric surface water cycle, the oceanographic coastal current variability, the Bojana river and its delta area.

The main objectives of the Project have so far been achieved. In particular, from the monitoring point of view all the previous activities of the Adriatic Sea, both in situ and remote, are being kept alive and upgraded, and a lot of new instrumentation has been procured and already installed, tested and made operational, in order to start the construction of a local monitoring system for the sea, the hydrology and the meteorology. A lot of sea cruises have been carried on with physical and bathymetrical purposes. From the modelling point of view five different types of

models have been implemented at different resolutions and upgraded: ocean models, hydrological and atmosphere models, wave models, river models, and sewage system models. The majority of these models have been coupled together to simulate the whole integrated water cycle, and its variations under climate change scenarios for the period 2020-2030. Preliminary results have been achieved and investigated in terms of variation of the main sea properties in the Montenegro coastal area and Bojana River runoff and solid transport variability for the Bojana River. At last, a great amount of historical local data (geographical, physical, meteorological, hydrological, oceanographical, sedimentological, and on water and sediment quality) has been collected from old local sources and organized in an archive. All the documentation has been made available on the official web site of the project (<http://gnoo.bo.ingv.it/adricosm-star/>), and a very important Information Management System – the Adricosm-Star GeoPortal - has been implemented, in order to provide basic services to ADRICOSM STAR partners and users (data exchange), to highlight the partners products and services, to start the implementation of INSPIRE compliant Information System (based on discovery service, viewing service, downloading service, transformation service).