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The Mediterranean Forecasting System Pilot Project

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MA53-CT98-0171

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Predicting what is likely to happen in the marine environment is an essential part of the management of marine resources which are being subjected to anthropogenic stress. If an operational coastal ocean environmental monitoring and forecast system is to be developed, the marine science community must be able to determine the potential timescales of predictability of the marine ecosystem. Such a system should be able to:

- provide estimates of the changes in both the physical and biogeochemical marine environments
- provide greater understanding of how marine ecosystems function, an essential element in guiding resource management
- provide an early warning system of potentially harmful ecological events
- aid the formulation of cost effective preventive and remedial measures.

To address these issues the project takes existing ecosystem models and explores, models and quantifies the potential predictability of certain ecosystems. The IMBC contribution to the project takes the ERSEM model and applies it to the Cretan sea.

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The Institute

Management of Marine Environment/ Technology

Coordinator:

ISAO-CNR : Istituto di Scienze dell'Atmosfera e dell'Oceano - Consiglio Nazionale delle Ricerche

Partners:

CRAM-ENEA : Centro Ricerche Ambiente Marino - Ente per le Nuove Tecnologie, l'Energia e l'Ambiente

NCMRG-IO-DMG : National Centre for Marine Research, Institute of Oceanography, Department of Marine Geology and Geophysics

CLS-SOC : Collecte Localisation Satellites SA, Direction Oceanographie Spatiale

UPST-LEGOS : Universite Paul Sabatier de Toulouse III - Laboratoire d'Oceanographie et de Geophysique par Observations Spatiales

UAT-DAP-LM : National and Kapodistrian University of Athens - Department of Applied Physics - Laboratory of Meteorology

NERC-PML : Natural Environment Research Council - Plymouth Marine Laboratory

IFREMER-CB-I : Institut Francais de Recherche pour l'Exploitation de la Mer - Centre de Brest - Systemes d'Informations Scientifiques pour la Mer

IOLR-DPO : Israel Oceanographic and Limnological Research Ltd - Department of Physical Oceanography

Associate Partners

ISDGM-CNR : Istituto per lo Studio della Dinamica delle Grandi Masse - Consiglio Nazionale delle Ricerche

DOGA-OGS : Dipartimento di Oceanologia e Geofisica Ambientale - Osservatorio Geofisico Sperimentale

ISTT-CNR : Istituto Sperimentale Talassografico di Trieste - Consiglio Nazionale delle Ricerche

CICCE : Consorzio Interuniversitario per la gestione del Centro di Calcolo Elettronico dell'Italia nord orientale

IMC : Centro Marino Internazionale, Italy

CETIIS : Cabinet d'Etudes Techniques Industrielles et d'Innovations Scientifiques SA

CNRS-DIMAR-O : Centre National de la Recherche Scientifique - Centre d'Oceanologie de Marseilles - UMR 6535

SAHFOS : Sir Alister Hardy Foundation for Ocean Science, UK.

IMBC : Institute of Marine Biology of Crete, Greece

MARTEDEC : Marine Technology Development Company S. A., Greece

DMN-SCEM : Meteo-France - Service Central d'Exploitation de la Meteorologie, France

ACRI : Mecanique Appliquee et Sciences de l'Environnement, France

CNRS-LPCMA : Centre National de la Recherche Scientifique - URA 2076, France

UPMC-LODYC : Universite Pierre et Marie Curie - Paris VI - Laboratoire d'Oceanographie Dynamique et de Climatologie, France

NRSC : Nansen Environmental and Remote Sensing Center

CSIC-CEA : Consejo Superior de Investigaciones Cientificas - Centro de Estudios Avanzados de Blanes, Spain

UPC-LEM : Universitat Politecnica de Catalunya - Laboratorio d'Ingenieria Maritimar, Spain

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Methodologies

The specific aims of [Work Package 7](#) is to determine the requirements for setting up a pre-operational forecast system for the Mediterranean ecosystem.

The specific objectives are:

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- to implement, validate and calibrate 1-D ecosystem models in data-rich regions of the Mediterranean basin
- to develop a data assimilation system for an ecosystem model which is suitable for use in an operational context
- to assess the forecast capability and predictability window of a state-of-the-art ecosystem model
- to establish the dynamic responses of models to variability in physical forcing and to indicate the appropriate temporal and spatial resolution of forcing functions
- to make recommendations for the cost-effective monitoring of those pelagic biogeochemical variables that most clearly indicate the state of the ecosystem, thus providing guidelines for the observational aspects of the second phase of the MFS.

With these aims in mind, the [Marine Dynamics and Numerical Simulations team](#) has applied the [ERSEM](#) model in the Cretan sea to study the biogeochemical cycles of carbon, the exchange of organic matter (suspended or dissolved), between pelagic and benthic systems, as well as the control mechanisms in primary production (respiration, grazing excretion, mortality, carbon, oxygen, phosphorus, and nitrogen).