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" DECISION SUPPORT SYSTEM FOR THE MONITORING AND MANAGEMENT OF THE ROMANIAN LITTORAL'S BATHING AREAS"

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Introduction

The aim of a dynamic web-based support system, designed to enhance the forecasting of the marine and coastal waters, is to integrate numerical models with in-situ measured data, as well with remote sensing products.
The implementation of ISWIM, a dynamic web-based mobile-friendly decision support system, was intended to enhance the management, monitoring and forecasting of the water quality (iSWIM, http://iswim.rmri.ro) for the Romanian marine and coastal zone, integrating numerical models (downscaled from Copernicus Marine Environment Monitoring Service - CMEMS - local solution) with in-situ measured data and CMEMS remote sensing products.
The operational system also integrates in near real time specific oceanographic data from a coastal station as a base of documentation of water quality of marine bathing areas on central transitional unit of Romanian littoral.
In this specific application, the coastal station data of Mamaia bay provides an important input of hydrometric, physical, chemical and biological parameters for the description of the coastal/marine waters' ecological status.
The system is developed for public health and touristic/navigation purposes and provides data and information through a monitoring-modeling service for bathing areas of the Romanian touristic littoral.
The results of several validation studies for the above mentioned system, contributes to *the significances* of certain aspect of its implementations for operational purposes in public safety and coastal navigation. The sesonal variations of hydrodynamic waves emphasise a good correspondence between model and in-situ measured data.
Based on the comparison of the model results and data collected at Mamaia bay, several implications on field data measurements will be emphasised for model application as a decision system for monitoring and management of the Romanian Littoral.

Key Words: decision support system, near-real time data system, EO, bathing areas, coastal zones

DATA AND METHODS

Fig. 1 Oceanographic station of Mamaia Bay/central unit of Romanian littoral (44°13'54,034"N; 28°38'3,246"E)

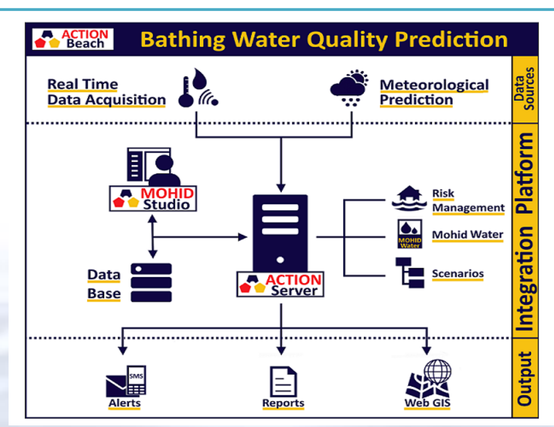


Fig. 2 Nar-real time/wireless integration in data flow

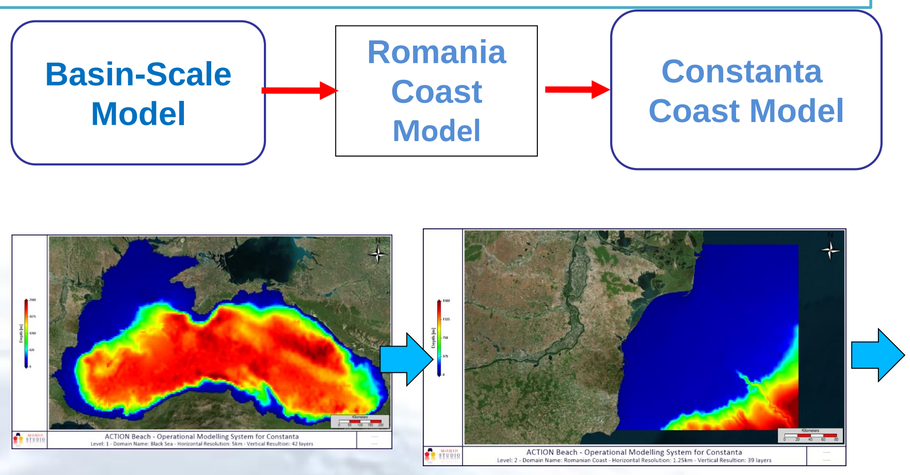
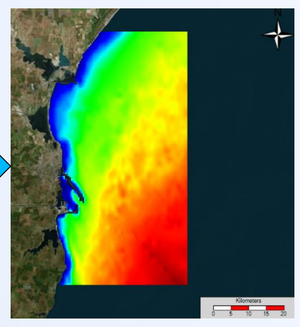


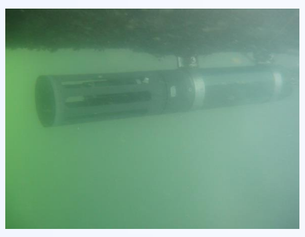
Fig.3 a/b Wave model – Approach in Mohid Studio

RESULTS AND DISCUSSION

COASTAL MODEL - Level 3 - Constanta Coast

- Grid
  - Horizontal Resolution 0.3 km
  - 18 Vertical Layers (Cartesian)
- Hydrodynamics Forcing
  - Wind
  - Discharges
- Initial Conditions
  - From Romania Coast Model (Level 2)
- Boundary Conditions
  - Wind (CMEMS)
  - Heat Fluxes (CMEMS)
  - Romanian Coast Model (Open Boundary/CMEMS)





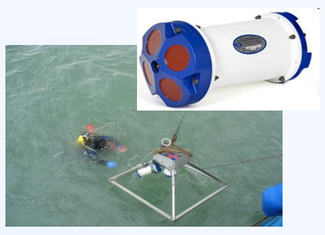
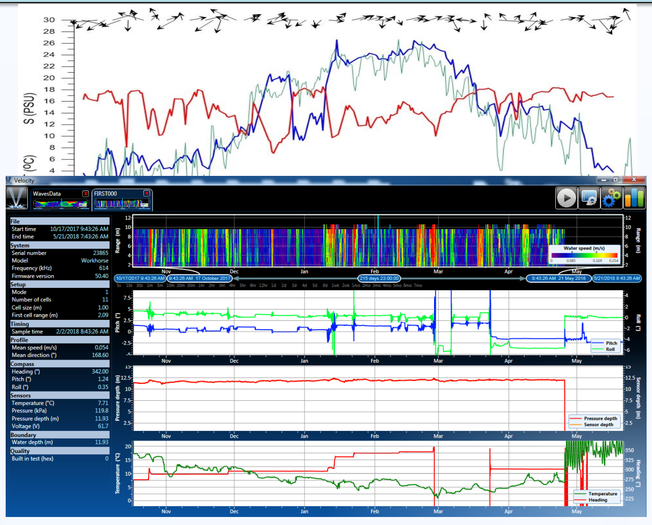


Fig 4 Hydrometric and WQ parameters in-situ measurements

IN-SITU vs MODEL DISTRIBUTION



Importance of the in-situ measurements is emphasized by the application of the validations techniques, encompassing the calculated parameters in MOHID Model, against the measured hydrodynamics parameters at regional/local scale

Fig.5 and 6 – Athmosferic parameters trends evaluation vs Waves and currents of Mohid Studio results

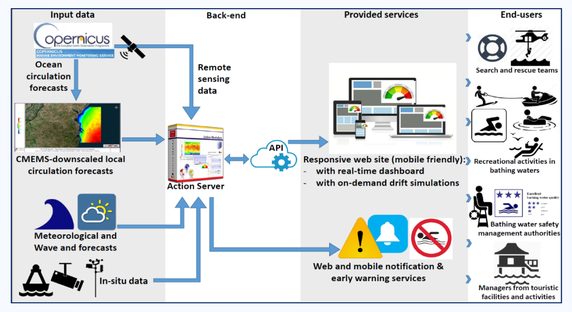


Fig. 7, Scheme of data flux integration for bathing areas management

Circulation module of ISWIM

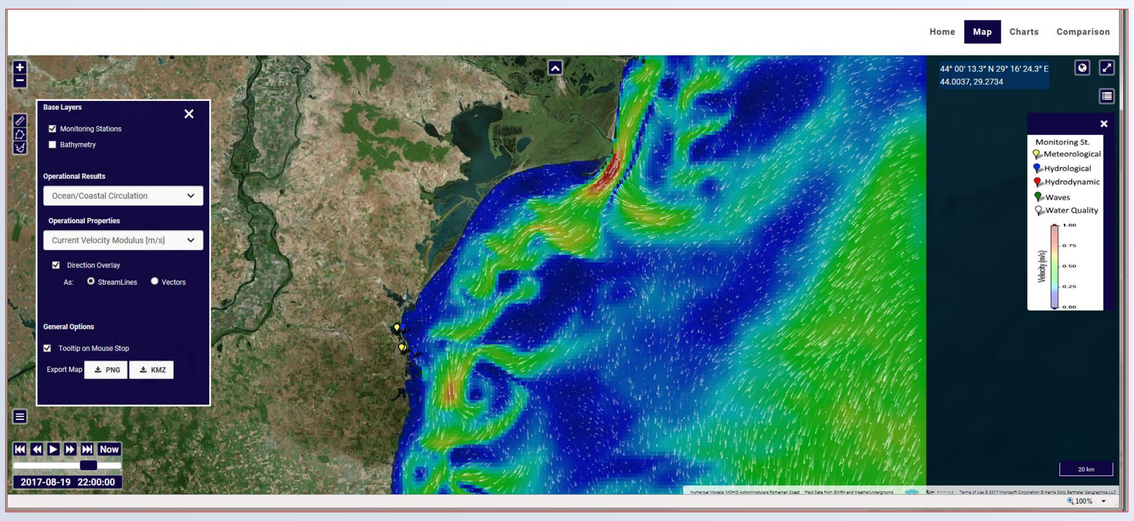


Fig. 8 Wind intensity distribution in a situation of NE direction

During touristic seasons the **NE** wind produce strong waves and currents

Waves distribution

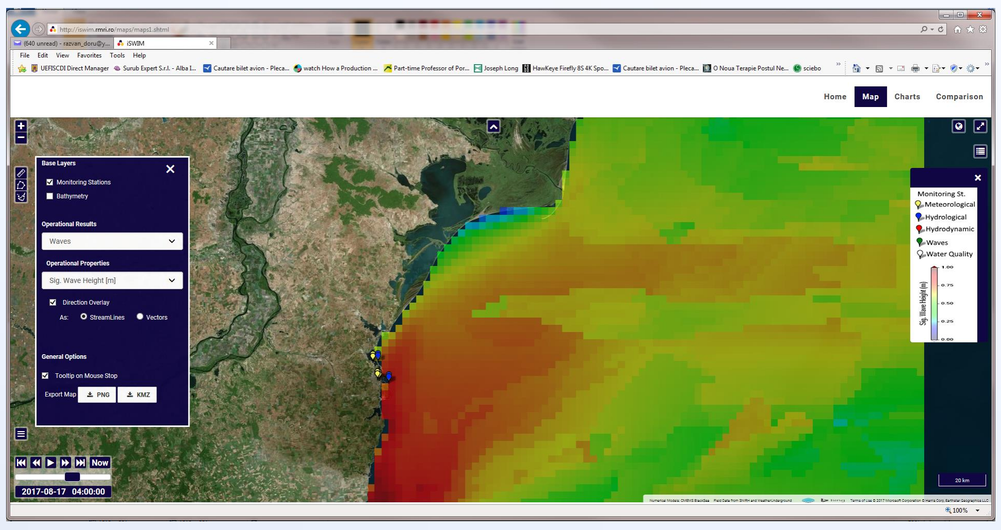


Fig. 9 Waves distribution within Storm situation on Romanian shelf

CONCLUSIONS

1. The long term waves modeling support the hydrodynamic research focused on understanding the physical-chemical parameters as approached on their connection to the dynamics of the atmosphere will allow the deepening of the oceanographic research / studies as part of the complex system to study the Black Sea, mainly focused on public safety and safe navigation

2. It is important to note that the iSWIM system including oceanographic near-real time data from the Mamaia station can be considered as an important basis for monitoring of the hydrodynamic and WQ parameters and consist a base for model validations for complex coastal areas, thus bringing an important support for the implementation of a Decision Support System for the management of the Romanian littoral's bathing areas .

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BIBLIOGRAPHY:

http://iswim.rmri.ro
http://www.cosmomar.ro
http://www.rmri.ro/Home/Products.MamaiaStation.html?lang=en