

**Интегрирана информационна система за
поддръжка управлението на бреговата зона**
*Integrated informational system in support of coastal
zone management*

ISSCZM

КОНФЕРЕНЦИЯ, ПЛАНЕТАРИУМ ВВМУ “Н.Й.ВАПЦАРОВ”

7 август 2015 г., гр.Варна

кап. I ранг, доцент, доктор Калин Калинов
Ръководител на проекта

Този документ е създаден с финансовата подкрепа на Програми BG02 и BG03 по Финансовия механизъм на Европейското икономическо пространство. Цялата отговорност за съдържанието на документа се носи от ВВМУ „Н.Й.Вапцаров“ и при никакви обстоятелства не може да се приема, че този документ отразява официалното становище на Финансовия механизъм на Европейското икономическо пространство и Оператора на Програмата – Министерство на околната среда и водите.





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BG 02 INTEGRATED MARINE
AND INLAND WATER MANAGEMENT



INTEGRATED INFORMATIONAL SYSTEM IN SUPPORT OF COASTAL ZONE MANAGEMENT - IISSCZM

General information

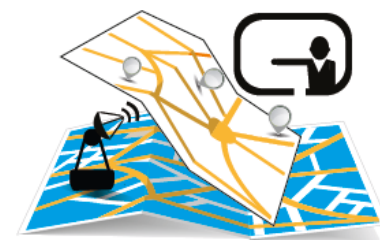
1. Duration: 11 months (30.03.2016)
2. Amount: 1 147 655 Euros
3. Beneficent: Nikola Vaptsarov Naval Academy
4. Partner: Black Sea Basin Directorate - Varna
5. Associated partner: Regional Administration Varna



Financial Mechanism

BG02 INTEGRATED MARINE AND INLAND WATER MANAGEMENT

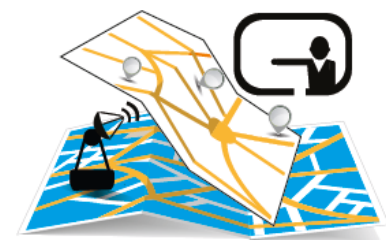
BG02.01: More integrated management of
marine and inland water resources



Main idea

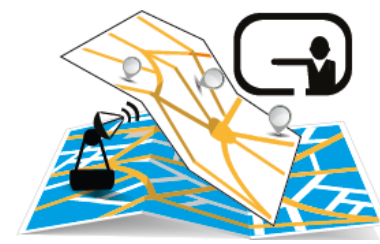
The idea of the project is to address the disadvantages of the sea monitoring systems:

- lack of compatibility;
- informational layers aren't shared among the possible users;
- hydroacoustic noise and oil pollution layers do not exist;
- oil pollution predicting module is not still elaborated;
- static nature and lack of capacity for precise picture;
- lack of publicity.



The main objective

While addressing all the disadvantages the main objective is to enhance the ICZM through *establishment of an integrated informational system.*

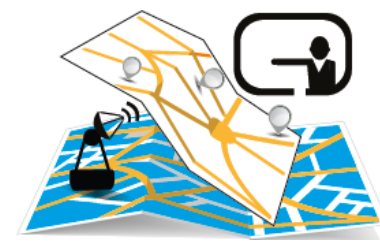


Outcomes

The following outcomes are to be achieved:

- hydroacoustic noise and oil pollution informational layers;
- oil pollution prognostication module and decision making support;
- operational model of a Zonal Integrated Monitoring System;
- data integration system;
- network of operational and publicity centers.

The output is to be an **integral**, open for **enlargement** and **distributed** informational system for sea monitoring and decision support **combining static and real time data**.



Monitoring process

The sustainable Bulgarian coastal zone development is based on the Integrated Coastal Zone Management (ICZM). Currently the informational systems are established in many governmental bodies. Monitoring systems exist in the following agencies:

- Executive Agency Maritime Administration;
- Bulgarian Port Infrastructure Company;
- Executive Environmental Agency;
- Black Sea Basin Directorate;
- Institute of Oceanology;
- Institute of Meteorology.



The problem of compatibility

The main disadvantage of the existing systems is the lack of compatibility. The informational layers aren't shared among the possible end users but **locked in one institution**. For example the Regional Administrations of the coastal regions do not have access to any informational layer.

Additionally some informational layers are still not developed. The **hydroacoustic noise and oil pollution layers** are suitable examples.



The oil pollution and statics

The next disadvantage of the system is that the **oil pollution module is not still elaborated**. This module has to display the ongoing situation of the oil spills and to provide a reliable prediction of the situation.

The third disadvantage of the system is its **static nature**. In order to provide reliable decision making support to the ICZM a dynamic mode of the supporting informational system is necessary.



The coverage and publicity

The **coverage** of the whole Bulgarian Black Sea area also seems to be a problem. Very often the management needs a precise picture based on a real time data and focused on a close area of interest rather than the global picture of the coastal zone. The **existing systems do not provide zonal focus** and related information.

The next disadvantage of the existing system is the **lack of publicity**. It is difficult for the ordinary citizen and the NGOs to find information which is spread among variety of institutions.

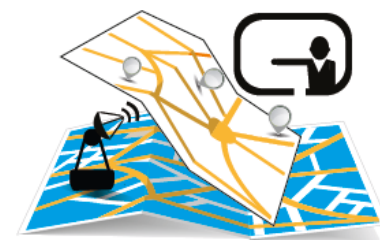


Additional considerations

Additionally the informational system is to:

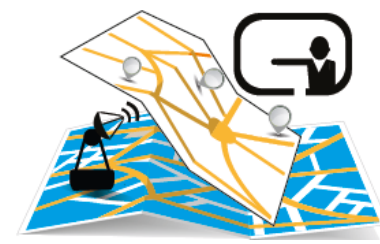
- be open for adding new sensors and informational layers and new operational centers;
- provide training (educational) and operational mode;
- be regularly upgraded;
- be operational after the project end.

The project includes four work packages.



The deadline 2016

1. Drilling for oil and gas – how to support?
2. Ballast water convention – how to implement



Work Packages

The project includes four work packages.

1. WP 1 Development of a model for Zonal Integrated Monitoring System (ZIMS).
2. WP 2 Elaboration of informational layers.
3. WP 3 Elaboration of an oil spill monitoring and movement prediction module.
4. WP 4 Data systematization and processing.

WP 1 Development of a model of a ZIMS



- 1.1. Maritime zoning of Bulgarian coastal zone and marine spaces
- 1.2. Ecological zoning of Bulgarian coastal zone and marine spaces
- 1.3. Maritime industry zoning of Bulgarian coastal zone and marine spaces
- 1.4. Maritime critical infrastructure zoning of Bulgarian coastal zone and marine spaces
- 1.5. Maritime security zoning of Bulgarian coastal zone and marine spaces
- 1.6. Maritime urban zoning of Bulgarian coastal zone and marine spaces

WP 1 Development of a model of a ZIMS



1.7. Development of a Software Simulator of floating and stationary monitoring platforms. The floating platform is a mobile part of the ZIMS. The platform includes the following components:

- Floating construction (buoy);
- Electrical subsystem;
- Subsystem for positioning and orientation.

WP 1 Development of a model of a ZIMS



Equipment of the monitoring system with sensors. The following sensors are included:

1. Meteorological subsystem equipped with sensors measuring:
 - Wind (direction and speed);
 - Water (temperature);
 - Atmosphere (pressure and temperature).
2. Sea state subsystem measuring:
 - Current (direction and speed);
 - Waves (amplitude).
3. Hydroacoustic subsystem:
 - Underwater noise (noise level and direction).
4. Optical subsystem:
 - Visual picture;
 - Thermo-visual picture (including pollution detection).
5. Physicochemical subsystem:
 - Oil products pollution;
 - Salinity of the water;
 - Oxygen concentration.

WP 1 Development of a model of a ZIMS



- 1.9. Elaboration of a project for Data Collection Unit – DCU
- 1.10. Development of a DCU
- 1.11. Elaboration of a project for data transceiver
- 1.12. Development of a data transceiver

- 1.13. Elaboration of a monitoring system model covering the whole Black Sea Coastal Zone

WP 2 Elaboration of informational layers



- 2.3. Elaboration of a project for noise measurement
- 2.4. Mapping the hydroacoustic noise
- 2.5. Mapping the hydroacoustic noise
- 2.7. Elaboration of a hydroacoustic noise informational layer
- 2.8. Elaboration of a model of the informational layer/layers for the data provided by ZIMS
- 2.10. Elaboration of a model of an oil pollution informational layer
- 2.12. Elaboration of a model of additional informational layers provided by the Basin Directorate and other potential users

WP 3 Elaboration of an oil spill monitoring and movement prediction module



3.1. Elaboration of a model of the oil spill monitoring and movement prediction module (laboratory and decision making and support center)

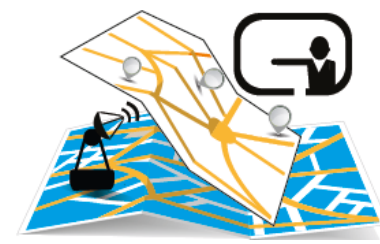
3.7. Equipment of the decision making and support center

3.10. Elaboration of a model for a laboratory for oil pollution and ballast water assessment



WP 4 Data systematization and processing

- 4.1. Elaboration of a model of the Integrated Informational System
- 4.2. Elaboration of a data collection module
- 4.3. Elaboration a picture compilation module
- 4.5. Elaboration of a data processing module
- 4.6. Elaboration of a model of the main operational center in the NVNA
- 4.9. Elaboration of a model of the operational center in the Black Sea Basin Directorate
- 4.11. Elaboration of a model of the operational center in the Regional Administration Varna



Benefits for researchers

The researcher community will benefit the following:

- possibility to provide deeper research on sea processes using integrated data provided by the Integrate Informational System;
- enhancement a communication between end users and researchers;
- possibility to demonstrate capacity solving a practical problem;
 - further development of the capacity of the already established research and development bodies – the Technology Transfer Center and the Development center;
- enhancement and further integration of the maritime researchers community;
- direct involvement of a science in the ICZM.



Benefits for students

The students of maritime institutes (Nikola Vaptsarov Naval Academy and Technical University of Varna) will benefit the following:

- possibility to practice in a modern integrated informational environment;
- access to real time data and possibility to see integrated sea state picture;
- possibility to have an integral (systematic) view on the processes in the coastal zone;
- direct communication with scientists and organizations responsible for ICZM;
- participation in research and development activities;
- participation in the processes of ICZM.

Additional benefits are many but in conclusion let only point that the system will be open, integral and providing publicity it will contribute to enhancement of management and its transparency.



Sustainability

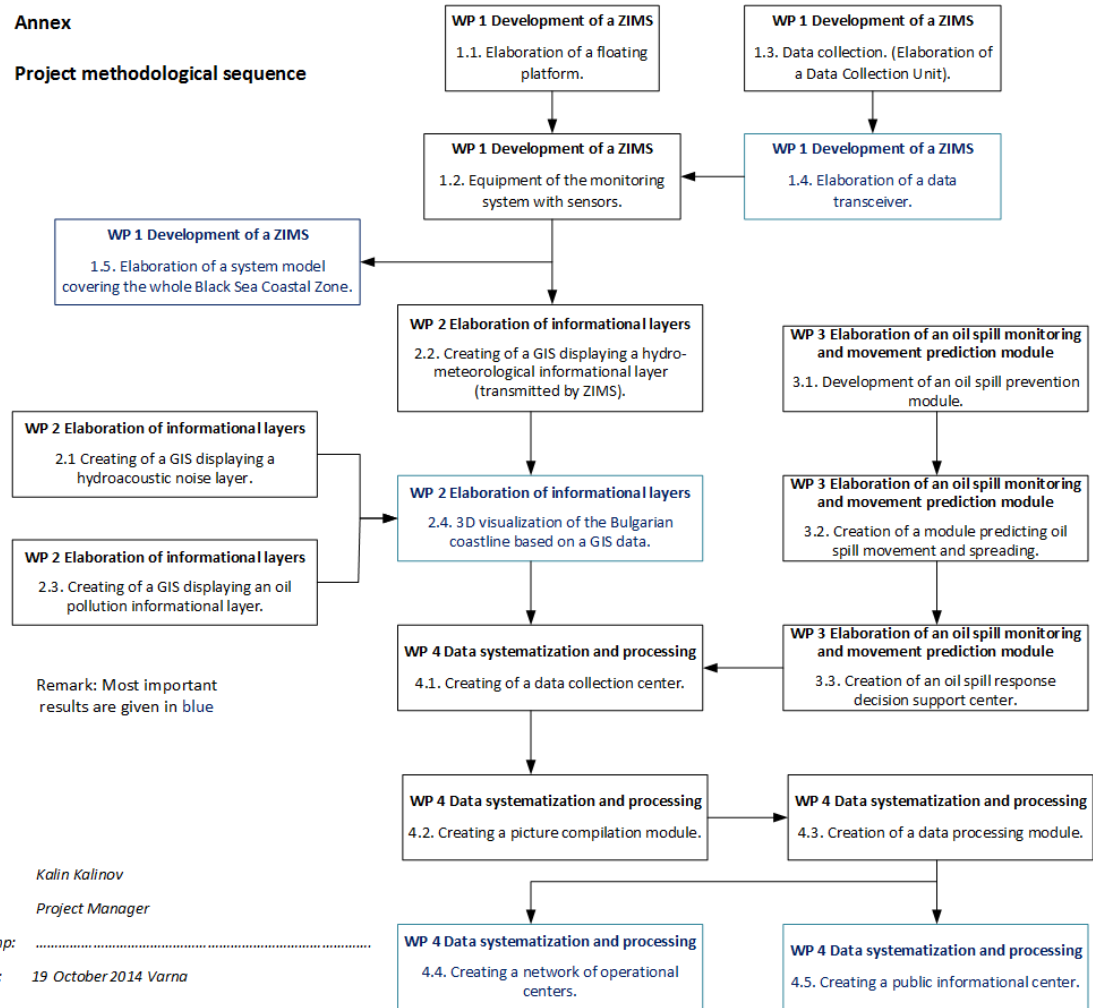
The general idea is to establish a system which **works both in operational and training modes**. This will allow using the system in the process of educating students who study for wide spectrum of maritime professions and especially Ocean engineering, Port exploitation, Water transportation management and Ship engendering. All these courses have disciplines related to sea monitoring, ecology and coastal zones management. Additionally the training mode of the system will allow organizing courses preparing personnel for the system users institutions.

As for the special maintenance of the software and networks established it has to be noted that the equipment of the system is an activity that will be performed with participation of the **Development Center** of the Naval Academy.

Methodology



Annex
Project methodological sequence



Name: Kalin Kalinov
 Position: Project Manager
 Signature, stamp:
 Date and place: 19 October 2014 Varna



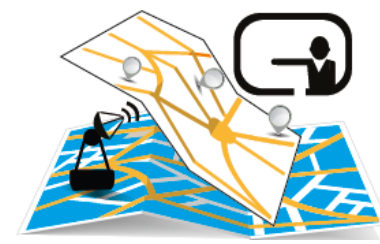
Expected results

1. Integrated Informational System with related software and hardware.

The hardware will include:

- equipment of the main operational center in the Naval Academy;
- equipment of the operational center in the Black Sea Basin Directorate;
- equipment of the operational center in Regional Administration Varna;
- equipment of the publicity center in the Naval Academy.

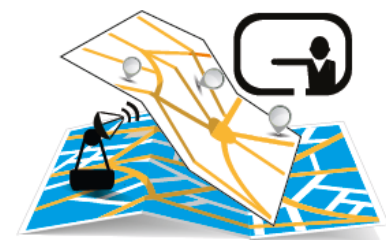
The equipment will include computers, monitors, projector systems and consoles. Additionally the necessary network and optical devices has to be obtained.



Expected results

2. Software Simulator of floating and stationary monitoring platforms. The floating platform is a mobile part of the ZIMS. The platform includes the following components:

- Floating construction (buoy);
- Electrical subsystem;
- Subsystem for positioning and orientation.



Expected results

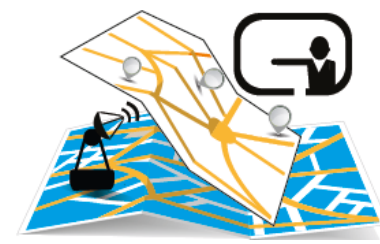
3. Elaboration of a monitoring system model covering the whole Black Sea Coastal Zone



Expected results

4. An oil spill prevention module based on a tankers cargo handling and maneuvering laboratory. The following software, hardware end equipment are included:

- cargo handling modeling software module;
- maneuvering modeling software module;
- computers, monitors, projector systems and consoles;
- communication equipment;
- network and optical equipment.



Expected results

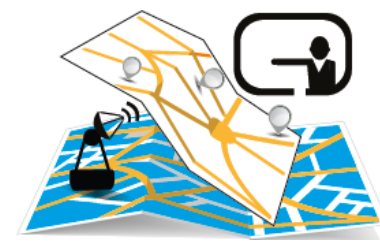
5. A laboratory for oil pollution and ballast water assessment.



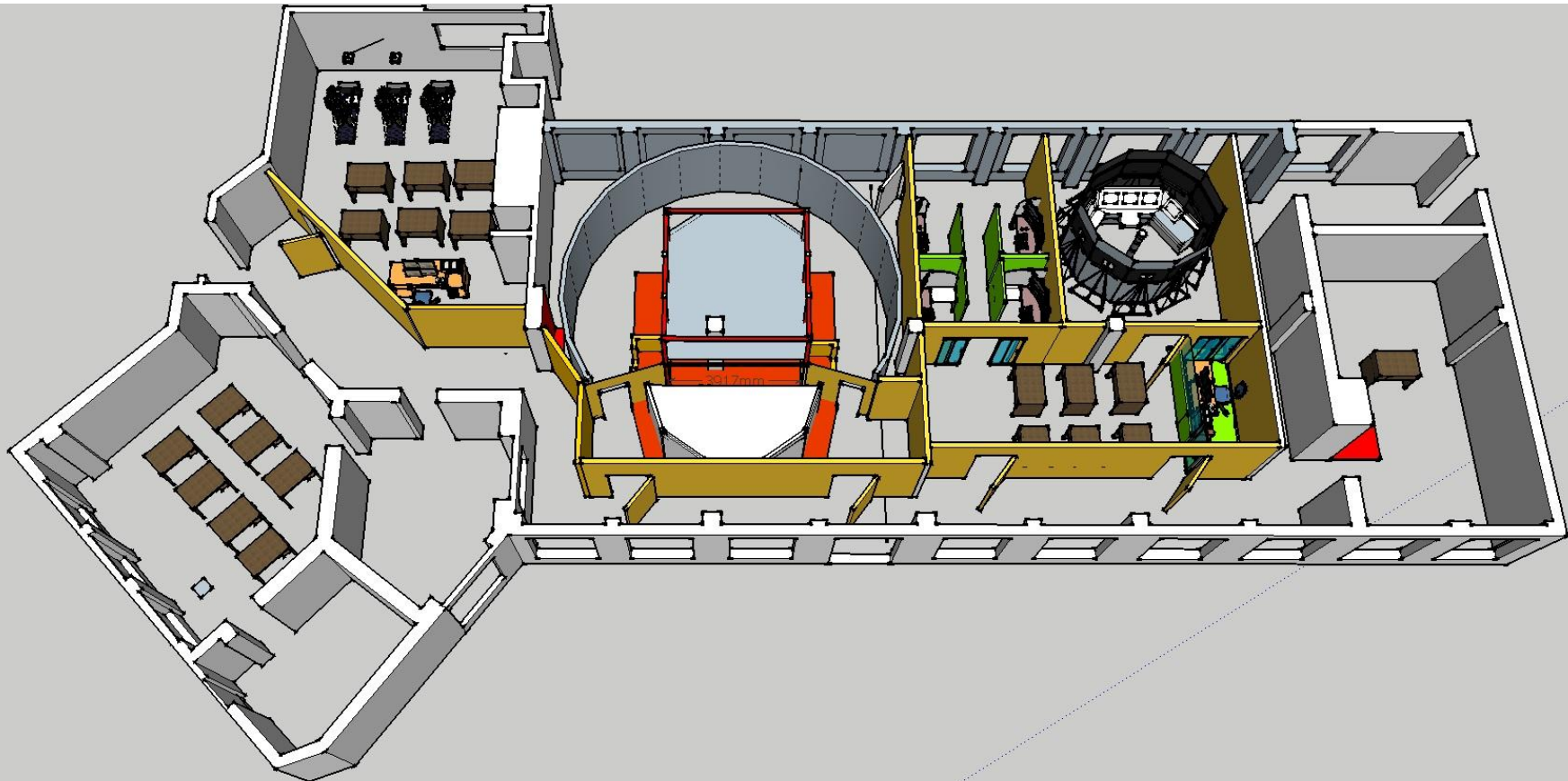
Expected results

6. GIS informational layers. The following layers will be developed:
- hydroacoustic noise layer;
 - hydro-meteorological informational layer. The layer will be elaborated on the base of the Hydro-meteorological data transmitted by the ZIMS;
 - oil pollution informational layer.

All the informational layers will be displayed by the Integrated Informational System. The system will provide maritime compilation picture which additionally will include existing informational layers on demand of the (Black Sea Basin Directorate and Regional Administration Varna) and other potential users. Additional product is the 3D visualization of the Bulgarian coastline. This 3D picture provides the environment where the informational layers will be displayed.



Expected results





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