

## Joint Operational Programme Black Sea Basin 2014 - 2020

# TIMMOD



**TECHNOLOGY INNOVATION IN ENVIRONMENTAL  
MONITORING AND MODELLING FOR ASSESSMENT  
OF FISH STOCK AND NON-FISH RESOURCES**

**INNOVATION WE NEED FOR THE BLACK SEA WE WANT !**

**ONE YEAR OF COOPERATION (MAY 2020 - MAY 2021)**  
Common borders. Common solutions.



## Project Partnership



Institute of Fish Resources (Lead Beneficiary)  
**IFR, BULGARIA**  
[www.ifrvarna.com](http://www.ifrvarna.com)



Black Sea - Danube Association for Research and  
Development, **BDCA, BULGARIA**  
[www.bdcabg.org](http://www.bdcabg.org)



Aristotle University of Thessaloniki  
**AUTH, GREECE**  
[www.auth.gr](http://www.auth.gr)



LEPL National Environmental Agency  
**NEA, GEORGIA**  
[www.nea.gov.ge](http://www.nea.gov.ge)



Regional Environmental Centre - Moldova  
**RECM, MOLDOVA**  
[www.rec.md](http://www.rec.md)



Danube Delta National Institute  
**DDNI, ROMANIA**  
[www.ddni.ro](http://www.ddni.ro)



## TIMMOD Rationale

**TIMMOD - Promoting Technology Innovation in Environmental Monitoring and Modelling for Assessment of Fish Stock and Non-fish Resources** is an EU funded project financed within the Black Sea Basin Program 2014-2020, under Priority 2. *Promote coordination of environmental protection and joint reduction of marine litter in the Black Sea Basin, Objective 2.1 Improve joint environmental monitoring.*

Main objectives of the project are:

- ✓ to improve joint environmental monitoring and modeling, by facilitating technology innovation;
- ✓ to improve the availability and quality of data, the cooperation in sharing of data for water quality, biodiversity statistics;
- ✓ to assess fish and non-fish living resources in the Black Sea - in line with the EU's Marine Strategy Framework Directive, Data Collection Framework, Blue Growth Strategy, Black Sea Convention on Environmental Protection and other EU and regional policies and conventions.

The TIMMOD project unites the efforts of six partner organizations aiming at technology innovation and improvement of transboundary cooperation on the environmental monitoring in Black Sea:

- ✓ Institute of Fish Resources (IFR), Bulgaria
- ✓ Black Sea - Danube Association for Research and Development (BDCA), Bulgaria
- ✓ Aristotle University of Thessaloniki (AUTH), Greece
- ✓ LEPL National Environmental Agency (NEA), Georgia
- ✓ Regional Environmental Centre - Moldova (RECM), Moldova
- ✓ Danube Delta National Institute (DDNI), Romania

The main target groups of the TIMMOD project are:

- ✓ National Public Authorities and international organizations;
- ✓ Local Public Authorities;
- ✓ Sectoral Agencies;
- ✓ Interest Groups including NGOs;
- ✓ Higher Education and Research.



## Specific Objectives & Main Activities

Specific objectives of the project are:

SO1. Achieve enhanced capacity of project partner organisations (and other stakeholders), to provide, use, and share, reliable and compatible environmental data for water quality parameters, fish and non-fish living resources. SO1 will be achieved by elaboration of a detailed inventory on technology innovation (incl. future and emerging technologies), and review on best practices, tested and demonstrated in Pilot Demonstration Projects (in the sea space near Bulgaria and Georgia).

SO2. Achieve better cooperation, improved environmental data-sharing between Black Sea partners, by creation of a set of ICT shared tools. SO2 will be achieved by comprehensive analysis on various ICT tools for data handling and numerical modelling of marine environment, including high level implementation of ocean-current modelling, and development of web-based data tools, integrated in a pilot demonstration Monitoring and Modelling Data Sharing Platform (MMDSP).

SO3. Put on the agenda an Innovation Strategy, designed to bring together (national, regional, EU) regulations and permits, combined with new monitoring and information technology, expanded transparency, and innovative enforcement. The Innovation Strategy is intended to scale-up the project results in all Black Sea area for years ahead - in line with the rapid technological growth - this way to secure sustainability of project results for “improving joint environmental monitoring”.

Main activities are grouped in four topics:

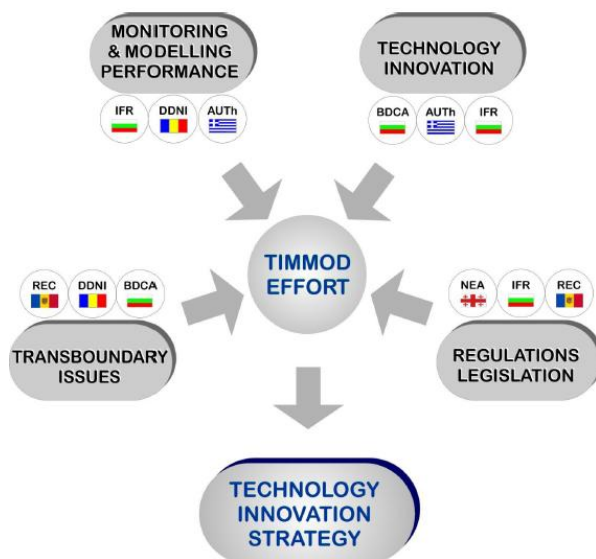
- ✓ Inventory and promotion of innovative environmental monitoring technologies for the assessment of fish stock and non-fish living resources.
- ✓ Assessment and recommendation on advanced hydro-environmental numerical tools for data handling, real-time control and forecasting of marine conditions in the Black Sea.
- ✓ Pilot demonstration project on innovative monitoring using advance methods and instruments.
- ✓ Innovation Strategy to improve joint monitoring, data sharing and cross border information exchange systems in compliance with Marine Strategy Framework Directive and Data Collection Framework for fisheries.



## One Year of Cooperation (May 2020-May 2021)

The project started in May 2020, and shortly afterwards, the official KICK OFF MEETING took place on 11<sup>th</sup> of June 2020, organised as an open online event, hosted by the Lead Beneficiary - Institute of Fish Resources in Varna, Bulgaria. The joint work of the project partners within the 4 group activities included in the work plan started from the first day of the project

Three Dissemination events together with three digital promotional campaigns took place in September 2020 in Varna, Bulgaria; in November 2020 in Chisinau, Moldova and in April 2021 in Thessaloniki, Greece. Two Thematic Transboundary Meetings (TTM1 & TTM2) on innovative environmental monitoring technologies and joint application of innovative systems in marine environment monitoring services were organized in November 2020 in Chisinau, Moldova and in April 2021 in Thessaloniki, Greece. Three important technical reports have been delivered.



One of the significant highlights of the activity in the first year was the active involvement of stakeholders. More than 30 organizations from five Black Sea countries were actively involved in the first year of project implementation, including representatives from local, regional, and national authorities, sectoral agencies, universities and research organizations, NGOs, etc.





## Thematic Trans-boundary Meetings

The Thematic Transboundary Meetings (TTM) are organized within the TIMMOD Project Network in order to raise awareness of researchers, surveyors and decision makers, and improve regional cooperation of their institutions on joint application of innovative systems in marine environment monitoring services, and cross-border data exchange, providing this way an essential output of the TIMMOD project, contributing to BSB Program result 2.1 “Improved availability of cross-border compatible environmental monitoring data and information”.

The first TTM was hosted by REC - Moldova in November 2020. Due to COVID-19 situation it was organized as an “online/hybrid” meeting - online meeting hosted in MS TEAMS, and face-to-face meeting in a conference room. More than 50 participants from six Black sea countries attended the first TTM.



The second TTM on innovative environmental monitoring and modelling technologies for assessment of fish stock and non-fish resources was organized as an online event at the end of April 2021, hosted by Aristotle University of Thessaloniki (AUTH), Greece. The focus of the meeting was put on the elaborated “Inventory on innovative environmental monitoring technologies for assessment of fish stock and non-fish species” and a Seminar on advanced modelling applications. The meeting was attended by 50 participants, representing project partners and different stakeholder organisations.



## Technical Reports

During the first year of the project, three (3) major technical reports (deliverables) have been completed by the TIMMOD partners' team.

The report “Situational analysis of the Monitoring and Assessment of Black Sea Fish and Non-fish Living Resources and recommendations to increase the efficiency of use of available methods and tools” was developed as a collective effort of 6 partners from the Black Sea region, from Bulgaria, Georgia, Moldova, Romania and Greece, focusing primarily on the characteristics of the state of monitoring and assessment of living resources of Black Sea in the above countries. For the completeness of the report, the most general characteristics for the other Black Sea countries - Turkey, Russia and Ukraine, are presented, as obtained from published data and analyses on this topic. This report presents a situational analysis of the monitoring and assessment of Black Sea fish and non-fish living resources, aiming to provide recommendations to increase the efficiency of the use of available methods and tools.

The report “Inventory on Technology Innovations in Marine Environmental Monitoring and Assessment of Fish Stock and non-Fishing Recourses” aims to provide recommendations to possible application of efficient modern monitoring technologies in the Black Sea area, in order to improve cooperation and data sharing between Black Sea countries. The analyses, conclusions and recommendations in this report are intended primarily for researchers, surveyors, decision makers, and relevant stakeholders concerned with fisheries and environmental protection of the Black Sea, but at the same time this report provides valuable information that can be used by a wider range of private or public institutions, industry companies, and the general public.

The report “Study on transboundary coordination mechanisms, available organisational and human resources in the area, and their relevance to the planned technological upgrade. Identifying priority issues, set in accordance to the MSFD and DCF” includes analysis on transboundary coordination mechanisms, analysis of gaps of the cross-border information exchange systems, on the available organizational and human resources in the partner counties and in the BS area as a whole - focused on their relevance to the planned technological upgrade. Priority issues were identified in the report. Focus was put on how the technological upgrade will favourably influence the implementation of MCFD and DCF programmes at Black Sea Basin scale.



## Raising Awareness. Dissemination of Results

A critical component of the project implementation is raising public awareness. Wide public awareness and education campaign on Black Sea living resources will provide significant impact on project results.

**TIMMOD First Dissemination Event:** The first dissemination event of the TIMMOD project took place on 11<sup>th</sup> September in Varna, Bulgaria. The event was organized by the Lead Partner - Institute of Fish Resources - Varna, and had the purpose to present the TIMMOD project in a nutshell in front of different stakeholders. The main goals, activities, and expected results of the TIMMOD project were presented to a group of 20 participants from different stakeholder organizations, such as River



Basin Directorate, Marine Cluster, Institute of Hydro- and Aerodynamics, etc. The application of modern technologies for monitoring and evaluation of Black Sea resources was one of the most discussed topics.

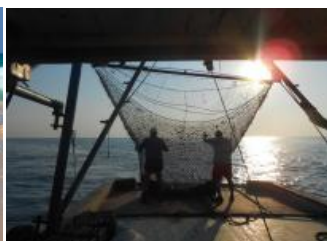
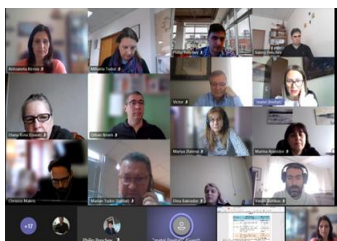
**Second Dissemination event:** Regional Environmental Centre Moldova /REC Moldova/, partner in the project “Promoting Technology Innovation in Environmental Monitoring and Modelling for Assessment of Fish Stock and Non-fish Resources” (TIMMOD) implemented within the Joint Operational Program “Black Sea Basin 2014- 2020”, hosted the dissemination event on 13 November 2020. Fifteen participants representing different stakeholders attended the event.

Main goals, activities and expected results of the project were presented. A printed leaflet on *Technology Innovation in Environmental Monitoring and Modelling for Assessment of Fish Stock and Non-Fish Resources* was distributed to participants.



**The third dissemination event** of the TIMMOD project is underway, taking place in May 2021 as an online event, hosted by Aristotle University of Thessaloniki (AUTH), Greece, with the main purpose to present the TIMMOD project in a nutshell in front of different local stakeholders.





## On the Wave of Innovation

New technology and innovative methodologies have always changed the way in which we monitor our seas. In recent years, data collection and continuous monitoring of sea water and ecosystems have developed, with a rapidly increasing role for:

- ✓ remote sensing technologies, including satellite image processing and aircraft-based photo technologies,
- ✓ rapid development of methods and tools for In Situ data collection (i.e., a multibeam sonar, a seabed camera, a chemical analysis of a taken sample), including sensor carrying platform (i.e., a research vessel, a static observatory, or an unmanned automated vehicle),
- ✓ advanced ICT tools for data processing (model data), visualization, analysis and forecasting for decision-making support.



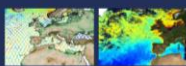
DATA

Ocean Products – 3 sources

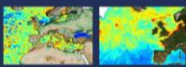
### Satellite data

Available in 2 processing Levels

- L3 – daily composite products, single/multi sensor (Along Track or gridded product)



- L4 – daily interpolated and weekly/monthly composites



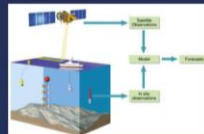
### InSitu data

From different networks and platforms

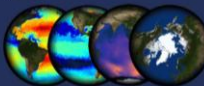


### Model data

From 3D numerical representation of the ocean with an assimilation of « real » data



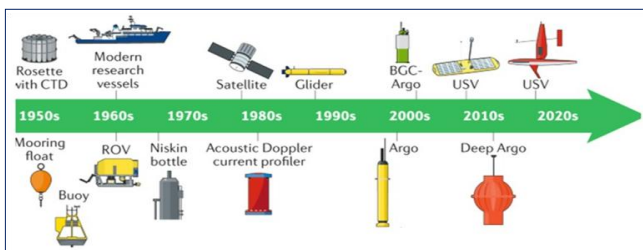
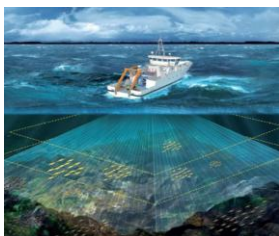
Physical, bio, wave and sea ice models are operated



All the above categories rapidly advance and it is essential to take the right technology for the task implemented, to understand the implications of using those technologies. It is the TIMMOD main objective to promote innovations in environmental monitoring for assessment of fish stock and non-fish living resources in Black Sea, where all the joint efforts of partners were put in Project Year 1.

The challenges are related to data sharing and sensor integration with increasing numbers and diversity of sensors and the volume of numerical data produced.

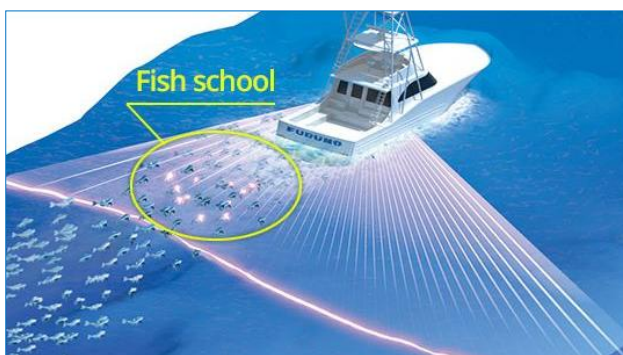
An overview of innovative technologies in the above listed categories is outlined in the report “Inventory on Technology Innovations in Marine Environmental Monitoring and Assessment of Fish Stock and non-Fishing Recourses”.



## Coming Next

Implementation of planned Group Activities within TIMMOD project will continue in accordance with the preliminary workplan, through the joint efforts of TIMMOD partners. By the end of 2021, these efforts will be focused on:

- Organization of the first and second Pilot Demonstration Projects on use of innovative marine monitoring technologies, in Varna (June/July 2021) and in Batumi (September/October 2021);
- Organization of the second and third Thematic Transboundary Meetings, to take place in Bulgaria, and in Georgia;
- Finalization, in the 4<sup>th</sup> quarter of 2021, of the technical reports on:
  - Recommendations on adoption of appropriate technology innovation and best practices for marine environmental monitoring at Black Sea”
  - Web-based open GIS tool for implementation of modelled data by stakeholders and end-users, including a database of hydro-environmental monitoring and modelling output and future projections
  - Draft Innovation Strategy to improve joint monitoring, data sharing and cross-border information exchange systems in compliance with MSFD and DCF on fisheries.



By completion of the TIMMOD Pilot demonstration projects and Thematic transboundary meetings, one of the main outputs of the project will be reached: *Raise awareness and improve regional cooperation of R&D organizations in technology innovation of marine monitoring for assessment of fish stock & non-fish living resources in the Black Sea.*



## TIMMOD Media

### Project web site

You can find diverse and up-to-date information about all activities and events on the TIMMOD project website. Visit us at: [www.timmod.org](http://www.timmod.org).

### E-Newsletters

As a part of the project promotional activities six e-newsletters are planned during the project implementation. Distribution of e-newsletters among project stakeholders within the Black Sea countries and beyond are the way to keep them duly informed on project progress. The First and Second E-newsletter editions have already been published within TIMMOD Year 1, and are available in English, Bulgarian, Georgian, Greek, and Romanian on the project website.



### Leaflets & Brochures

To give basic project information, two project leaflets & two project brochures will be used to reach the audience during main project events and external events.

### Find TIMMOD on Social Media



@ Facebook <https://www.facebook.com/TIMMOD-Project>

@ LinkedIn [TIMMOD Innovation Network](https://www.linkedin.com/company/timmod-innovation-network)

@ ResearchGate <https://www.researchgate.net/project/TIMMOD>



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