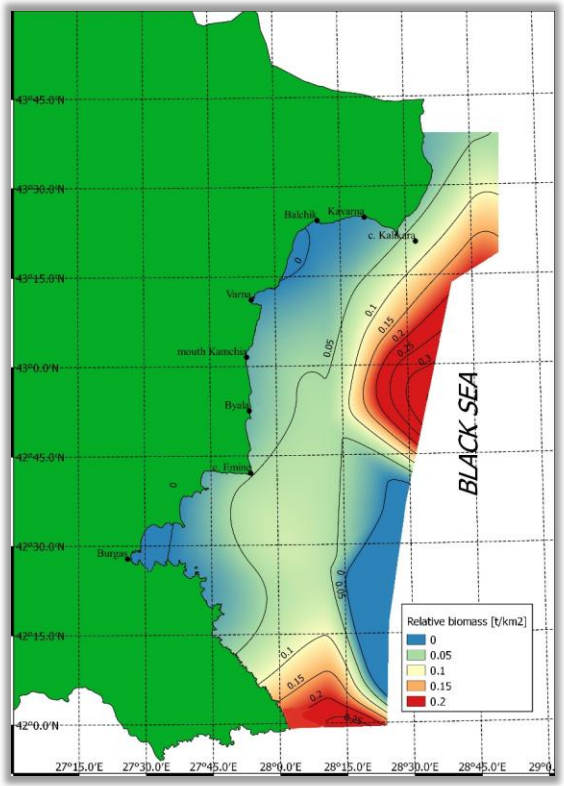
Project Partners:

	Institute of Fish Resources (**IFR**) BULGARIA www.ifrvarna.com
	Black Sea - Danube Association for Research and Development (**BDCA**) BULGARIA www.bdcabg.org
	Aristotle University of Thessaloniki (**AUTh**) GREECE www.auth.gr
	LEPL National Environmental Agency (**NEA**) GEORGIA www.nea.gov.ge
	Regional Environmental Centre - Moldova (**RECM**) MOLDOVA www.rec.md
	Danube Delta National Institute (**DDNI**) ROMANIA www.ddni.ro

WWW.TIMMOD.ORG



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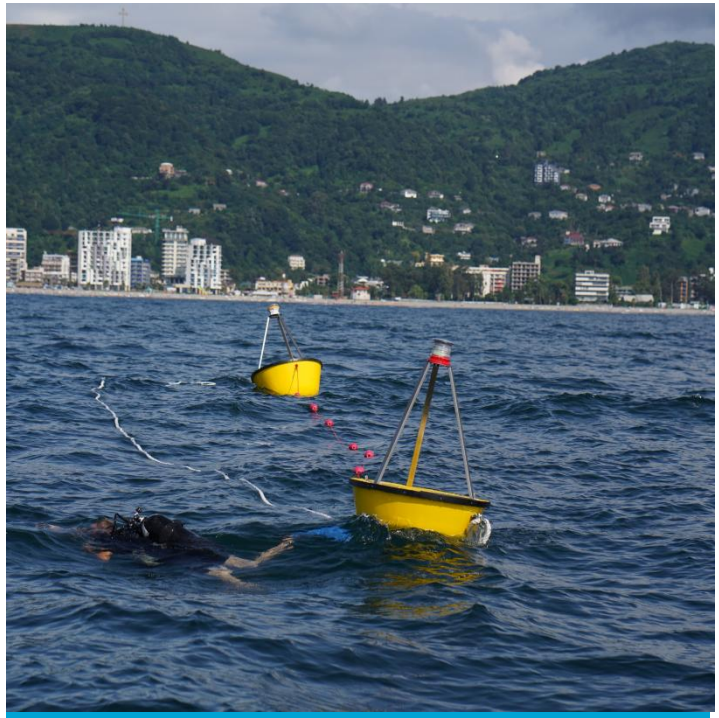
TIMMOD

Black Sea CROSS BORDER COOPERATION

Joint Operational Programme
Black Sea Basin 2014 – 2020

Common borders. Common solutions.



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

May 2020 – May 2022

CROSS BORDER COOPERATION

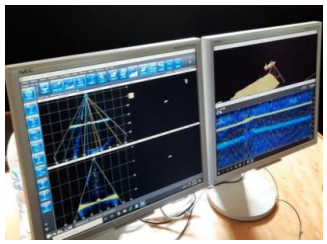
Demo tests at Black Sea

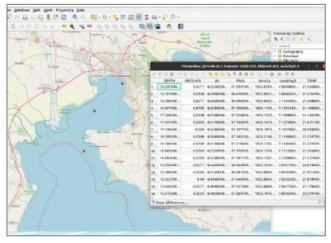
Demonstration of innovative equipment, data handling and numerical modeling tools was presented during the Pilot Demonstrations Tests, Trainings and Sea surveys at the two Black Sea sites - Varna, Bulgaria and Batumi, Georgia.

Experts from TIMMOD partners' organizations actively participated in the surveys and trainings being involved in the deployment of the measurement equipment on research vessel, preliminary testing and calibration of measurement devices, real-time measurements in the marine environment, transfer of data to a land-based station, web-based visualization (in real time), providing input for numerical models.

The participants had the opportunity to conduct measurements using different modern devices: multibeam sonar for fishery research, towed optical/video system, Conductivity, Temperature, and Depth (CTD) sensor, aquatic drone, multi-sensor water-quality probe, BioSonics Hydroacoustic Echosounder for fish stock assessment, Sealion2 Survey.

A portable water-based CTD buoy platform had been purchased within the project by the Georgian Partner - National Environment Agency. This is an independent system designed to monitor water quality, initially located in the Georgian Black Sea coastal zone. The CTD buoy will mainly measure three marine parameters: water conductivity, temperature and depth, online via GPRS communication, and continuously share data to the Project Partners.



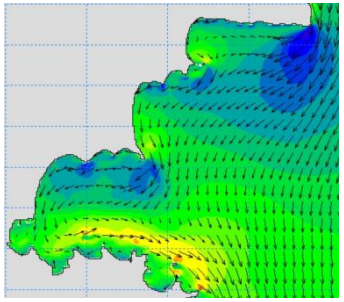


ICT Tools

One of the key results of the TIMMOD project implementation is a set of ICT tools for data handling and numerical modelling of the marine environment, including high-level implementation of ocean dynamics modelling, and development of web-based data tools. The ICT Tools will be integrated in a pilot demonstration monitoring and modelling data sharing platform on the project website www.timmod.org.

These tools will present a modern solution for handling and sharing three types of data:

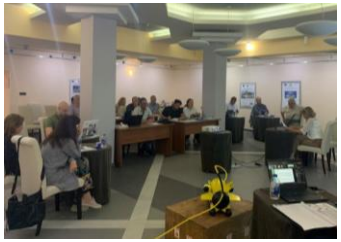
- Hydrodynamic and meteorological data (sea currents, wind, sea level pressure, etc.);
- Ecological data (biological, chemical and physical parameters of seawater);
- Data of fish and non-fish stocks.



Forecasting of the marine environmental parameters in two coastal areas – Varna and Batumi, is to be accomplished by using complex datasets feeding and forcing the models' setups by proper input and boundary conditions about the local hydrodynamics.

The atmospheric forcing input configuration together with initial estimations of local Bulgarian and Georgian river discharges' input have allowed the draft hydrodynamic circulation simulations.

Data from the Copernicus Marine Services' platform, together with digitization of georeferenced bathymetric data by GEBCO, EMODnet and Navionics platforms, have been used to setup the advanced 3-D hydrodynamic simulations with Delft3D model.



Innovation Strategy

Promoting technology innovations is the main focus of TIMMOD activities. All project partners are combining their efforts to develop an Innovation Strategy for further adoption and implementation of innovative environmental monitoring methodologies and tools.

The Innovation Strategy is designed to bring together national, regional, EU policies and regulations, combined with new monitoring and information technology, expanded transparency, and innovative enforcement.

National discussion and validation workshops addressed to key stakeholders in the water monitoring sector are planned for the first quarter of 2022. The workshops will take place in all project partner countries having the final international strategy validation in Romania.

If you are interested to be part of this process please join our TIMMOD community, expressing your will by e-mail: timmod@bdcabg.org.