

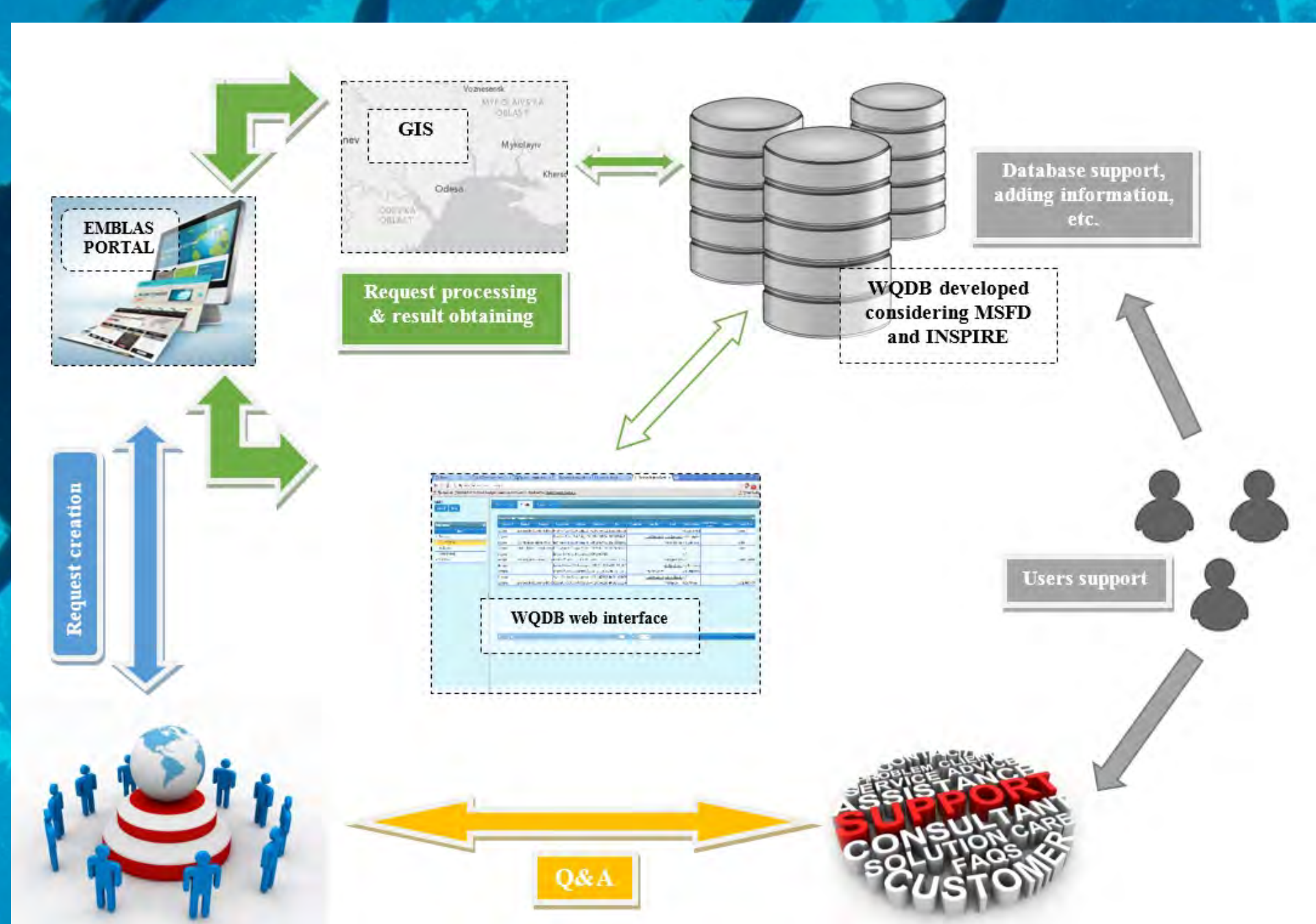
Black Sea water quality database within the EMBLAS project

THE EMBLAS PROJECT

The overall objective of the project is to improve the protection of the Black Sea environment. The project is addressing the overall need for support in protection and restoring the environmental quality and sustainability of the Black Sea.

The specific objectives are as follows:

- Improve availability and quality of data on the chemical and biological status of the Black Sea, in line with expected MSFD and Black Sea Strategic Action Plan needs;
- Improve partner countries' ability to perform marine environmental monitoring along MSFD principles, taking into account Black Sea Diagnostic Report.



THE DATABASE

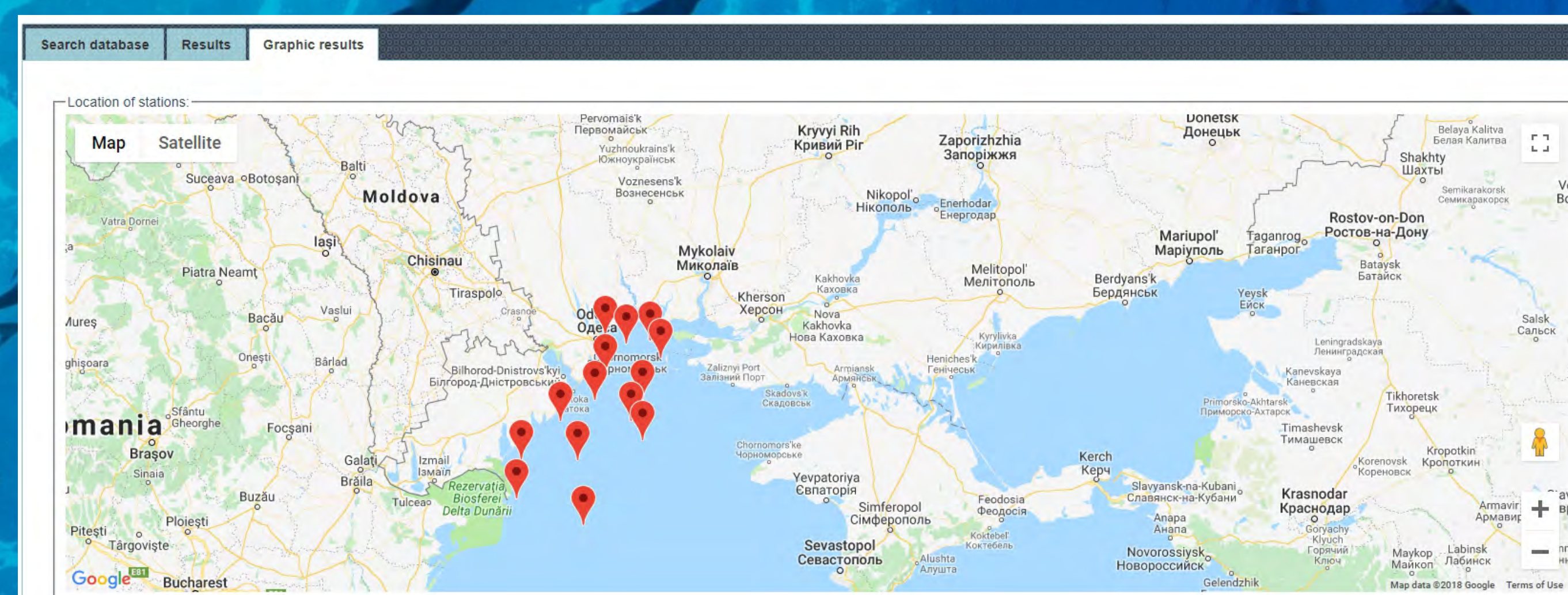
The large volumes of data were collected during the lifespan of the Project from the different sources including scientific marine monitoring cruises, observations aboard of the ships, etc. The information received on the following features: biological parameters (Phytoplankton, Zooplankton, Zoobenthos), chemical parameters (Pollution in water, bottom sediments, biota), indicators of eutrophication, marine litter, marine mammals and birds observations.

Cruise	Station	Longitude	Latitude	Date	Min Sampling depth [m]	Max Sampling depth [m]	Phylum	Class	Species	Volume of the cell [µm ³]	Abundance [1/1000cells/l]	Biomass [µg/ml]	Carbon biomass
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Diplonopsis lenticula</i> Bergh, 1881	8177.08333	0.565275908	4.62330621	0.576294066
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Lingulodinium polyedrum</i> (F. Smet) J.D. Dodge, 1989	47263.54167	0.094212651	4.452823376	0.498819172
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Dinophysis acuminata</i> Claparède & Lachmann, 1859	12363.75	0.188425303	2.329643338	0.28218765
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Ochrophyta	Bacillariophyceae	<i>Pseudo-nitzschia delicatissima</i> (Cleve) Heiden, 1928	393.75	5.872588605	2.312331763	0.215251381
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Cymodinium</i> sp.	4407.447917	0.376850606	1.660949417	0.215037766
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Prorocentrum candatum</i> (Carter) J.D. Dodge, 1975	2527.7	0.282637954	0.714423957	0.095684921
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Scopelogelidium trochoideum</i> (Seiss) Loeblich III, 1976	1619.0625	0.345446389	0.55929293	0.07697203
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Cymodinium</i> sp.	12265.625	0.031404217	0.385192351	0.046851266
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Heterosigma tinctoria</i> (Ehrenberg) Stein, 1853	2003.385417	0.094212651	0.188744252	0.025640108
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Lessardella elongata</i> Saldarriaga & F.J.R. Taylor, 2003	468.8433253	0.157021086	0.073158684	0.01092277
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Cryptophyta	Cryptophyceae	<i>Hillea fulviformis</i> (Schiller) J. Schiller, 1923	1046.666667	0.062808434	0.065739495	0.0092912
NPMS UA 16	NPMS_1_LUA	30.8275	46.2016	17.05.2016	0	0	Myxozoa	Dinophyceae	<i>Cymodinium nardum</i> J. Schiller, 1928	1962.5	0.031404217	0.061630776	0.008382817

THE WEB INTERFACE

User friendly web interface developed for the convenient search and query from the WQDB. Main features of this web interface are:

- Specific criteria data query filters;
- Results table view;
- Different formats of the data export (Excel, CSV, etc.);
- Query results for monitoring stations display on map (Query results for monitoring stations displaying on map);
- Displaying main statistical parameters;



THE STATISTICS

Web interface allows user to access the database statistics, that provides information about overall data quantity in the database or statistic data about specific query.

Parameter	MIN	AVG	MAX
Ammonia nitrogen, [µg/l]	0.001	6.62	161
Nitrate nitrogen, [µg/l]	0.001	19.31	2540
Nitrite nitrogen, [µg/l]	0.001	0.73	35.1
Organic nitrogen, [µg/l]	19.92	658.13	4743.5
Organic phosphorus, [µg/l]	0	16.19	161
Phosphate, [µg/l]	0.003	5.86	188
Silicon, [µg/l]	7	375.1	7500
Total nitrogen, [µg/l]	0.136	295.57	5601
Total phosphorus, [µg/l]	0	11.58	266

Database developed using the Microsoft SQL Server software with respect to the Marine Strategy Framework Directive requirements. Due to the use of the modern approach and methods during the development it became possible to provide different interactive map integration (interactive map services publication by means of ESRI ArcGIS) and data exchange services integration (data sets automation for the EMODNET and SeaDataCloud marine data exchange Projects from the BS WQDB).

The processed data of the surveys are inserted into the specially developed templates by the researchers and later uploaded into the WQDB using parser software also developed within the project.

<http://emblasproject.org>