Geoinformation System of the Russian Black Sea Coastal Zone

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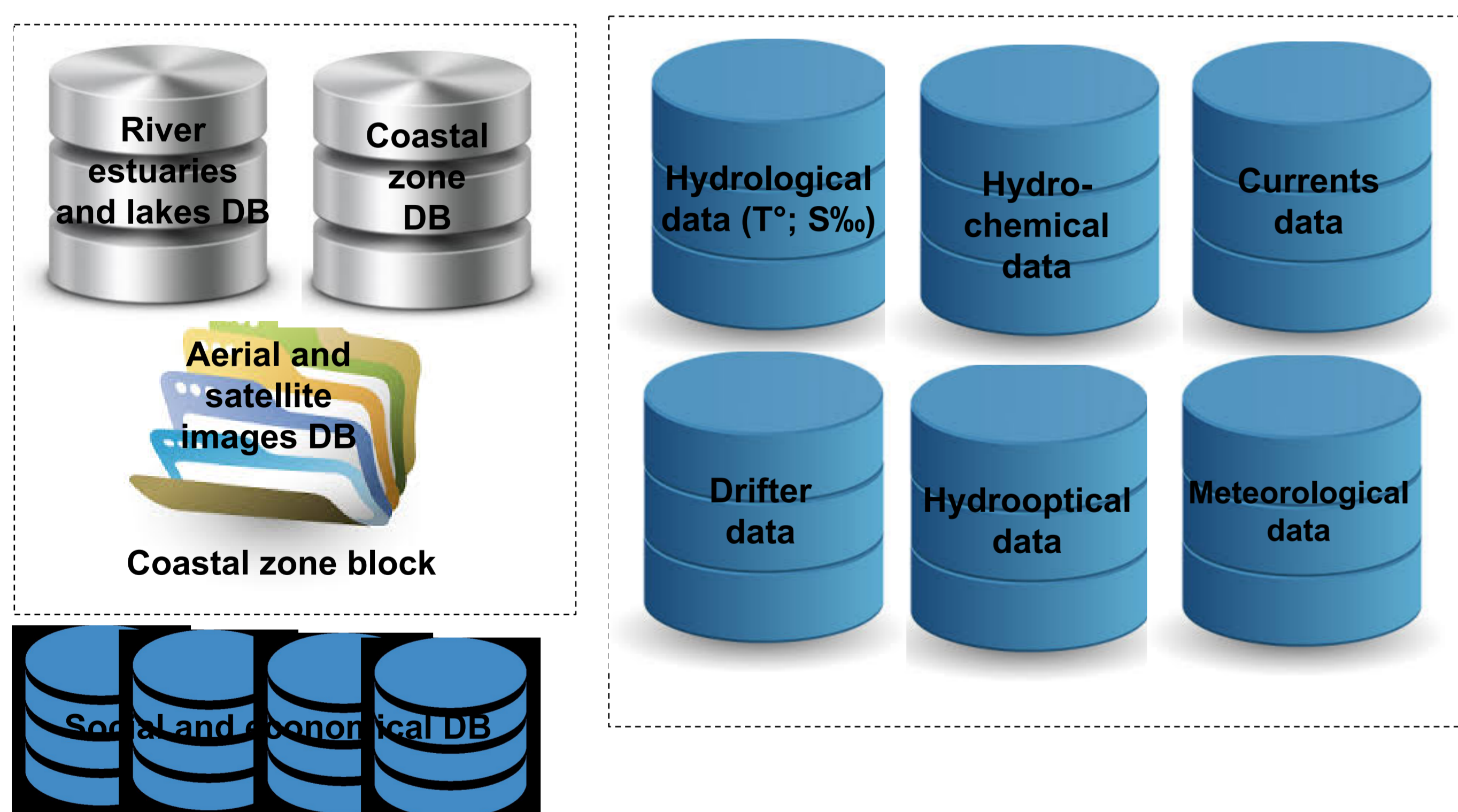
Introduction

Successful research and analysis of the current state of seas and oceans coastal areas require reliable information support. The most convenient instrument to solve this problem is GIS. At present, a GIS of the Russian Black Sea coastal zone is being developed in FSBSI "Marine Hydrophysical Institute of RAS" (MHI). While designing the GIS, particular attention was paid both to the software and to the databases used.

Databases

The specialized database for information support of the coastal research consists of two main blocks. One of them includes data of the oceanographic research in the costal area; the other one contains data obtained during the coastal research and remote observation for the coastal zone.

The oceanographic block is constructed using the Black Sea specialized database of Oceanographic data bank of Marine Hydrophysical Institute RAS [3]. It includes oceanographic and meteorological data. The Specialized database includes observations along the Crimean and Caucasian coasts of the Black sea. The database contains over 55,000 oceanographic and over 10,500 hydrochemical stations.
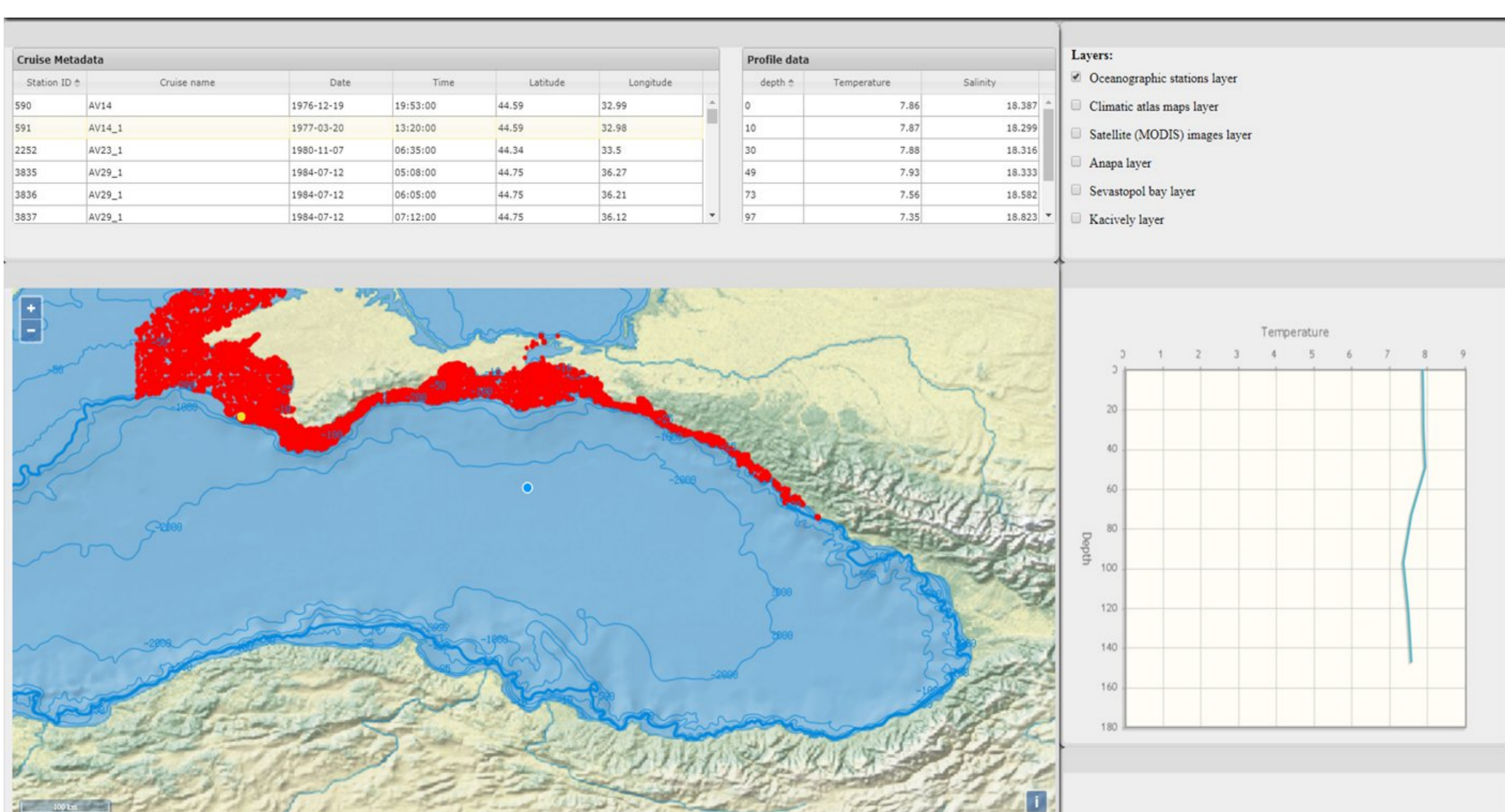The Coastal zone block consists of three databases:
the Database for the coastal zone study (the DB includes granulometric and mineral composition of sediments; morphological characteristics of the submerge slope, etc.);
the Database for the river estuaries and coastal lakes;
the Database of aerial and satellite images (the DB includes materials of aerial photography, satellite images, and photos and video from an intelligent camera installed on a drone [4]).
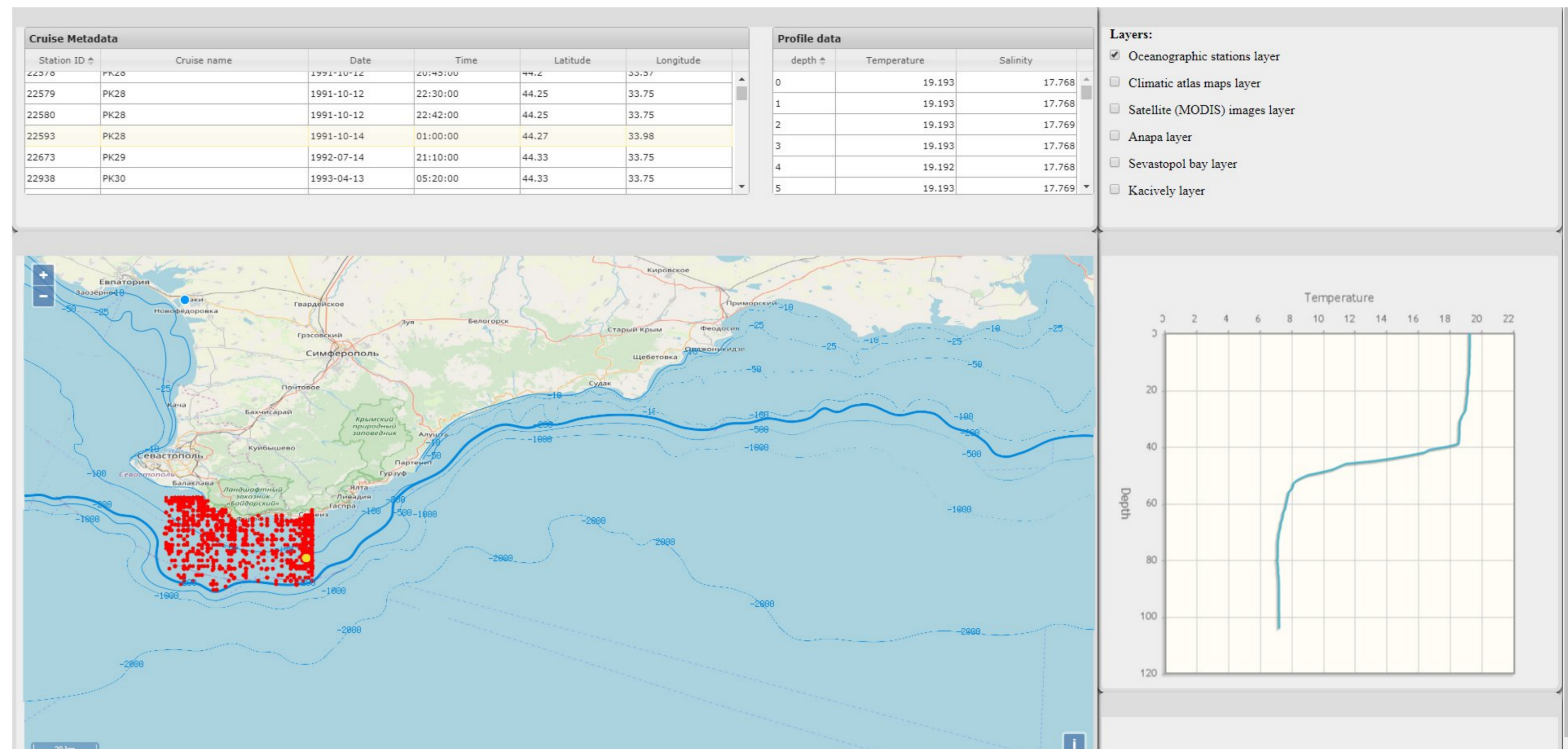

The structure of the specialized database for information support of coastal research

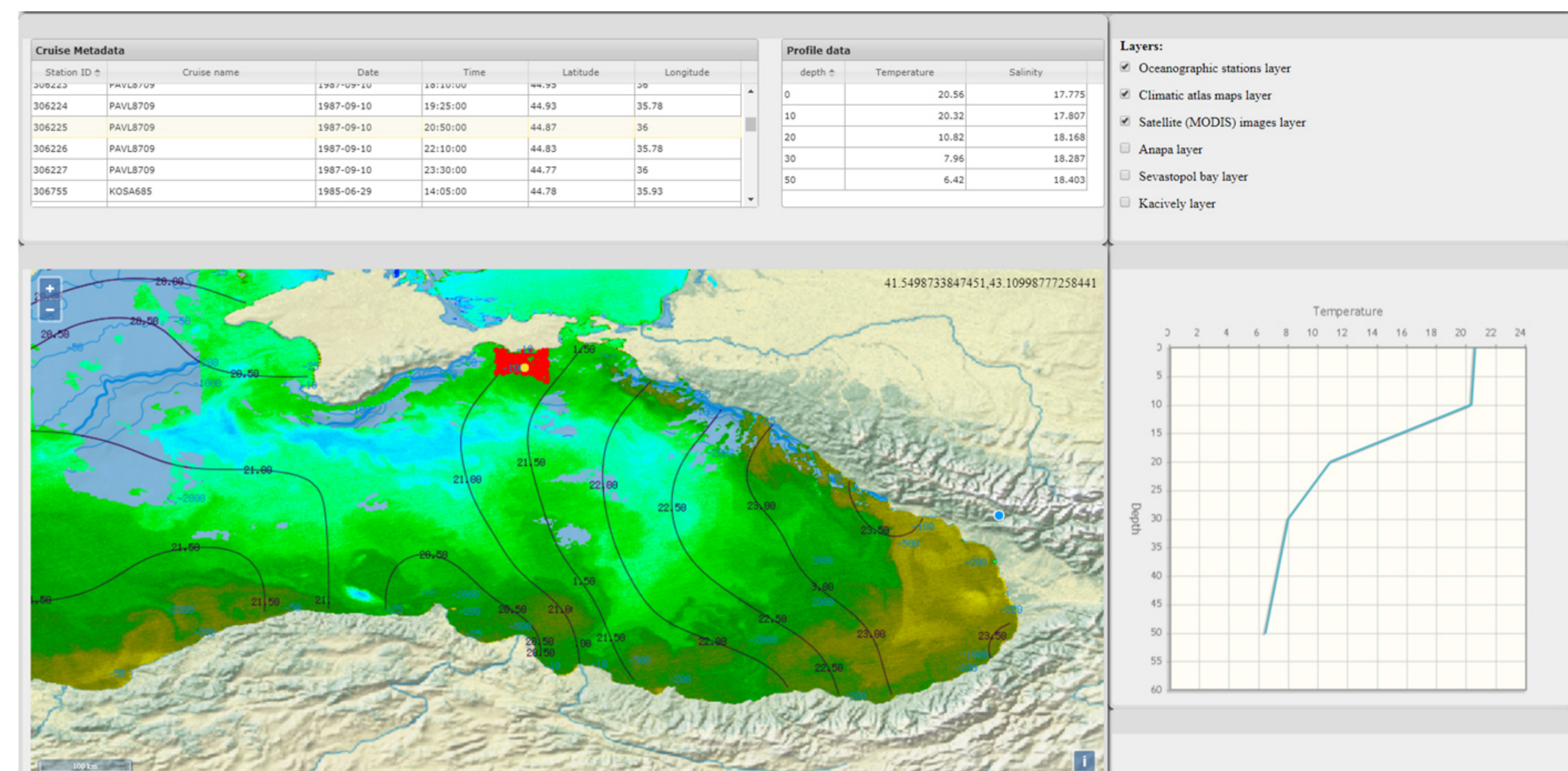## Coastal zone data access software

The Black Sea GIS software developed in MHI [1,2] was taken as a basis to provide data access via Internet. It was developed using the client server architecture, MapServer was used as a map service, and MySQL was applied as a database management system. This software enables selecting and visualizing tabular data kept in relational databases, as well as textual and graphical information. The Black Sea GIS module structure gives an opportunity of further extending the specialized database.
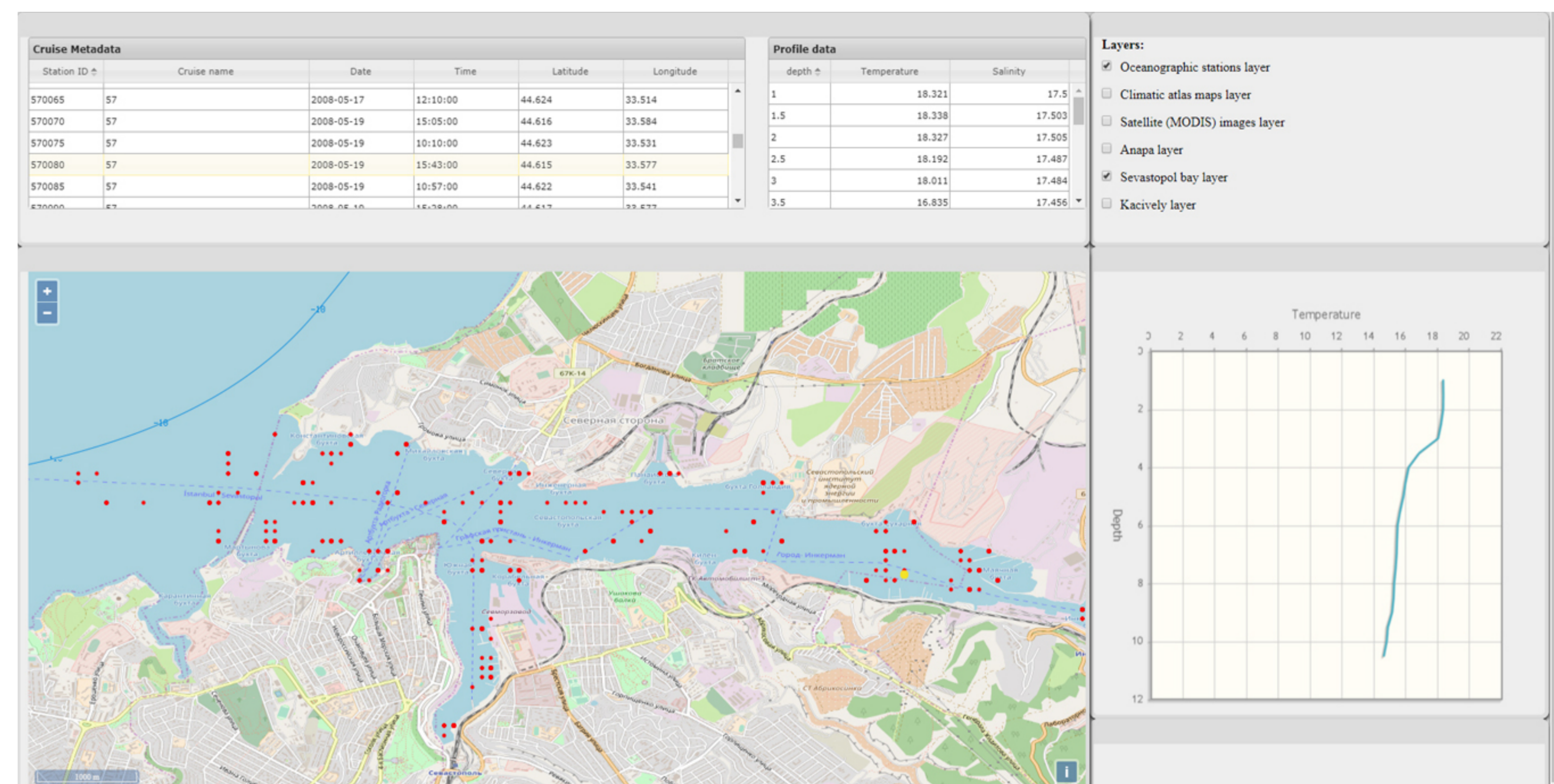

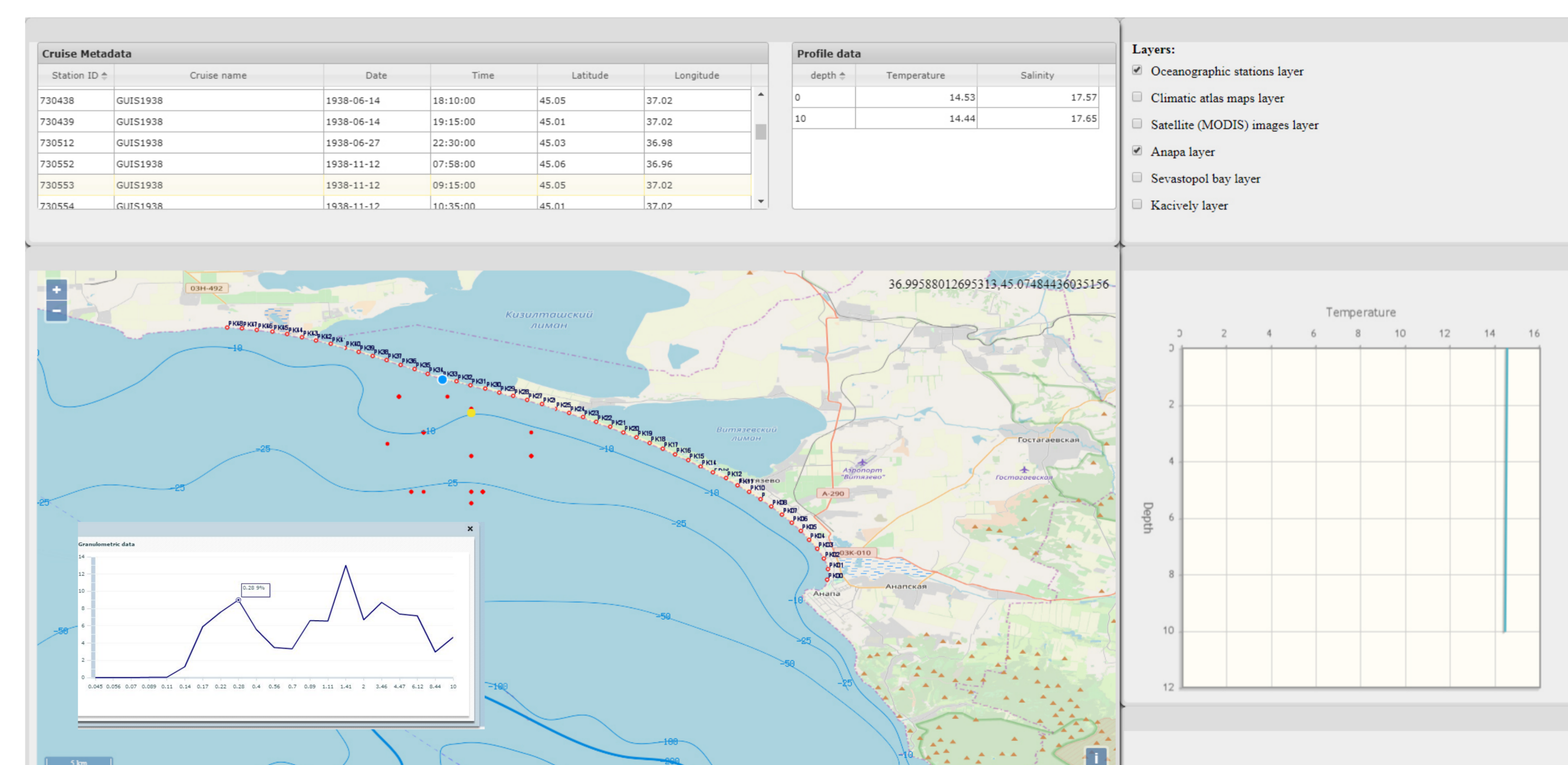Oceanographic data of the Black Sea coastal zone

Oceanographic data selection

Overlay of the selected oceanographic data, climatic map and satellite image

Oceanographic data selection for the Sevastopol bay

Granulometric composition of the Anapa bay-bar

Conclusions

The current version provides a convenient access and presentation of the data obtained while studying the Russian Black Sea coastal zone. At present, the activities aimed at the further GIS development, related both to improving the software and connecting new databases, are ongoing.

Acknowledgements