Desktop QC software test version

Alexey Khaliulin MHI RAS (Russia), khaliulin@yahoo.com
Eugeny Godin MHI RAS (Russia), godin_ea@mail.ru
Andrey Ingerov MHI RAS (Russia), ingerov@rambler.ru
Elena Zhuk MHI RAS (Russia), alenixx@gmail.com
Elena Isaeva MHI RAS (Russia), isaeva-ea@mail.ru
Isaac Gertman IOLR (Israel), isaac@ocean.org.il

QC procedure description

The approaches on creating a unified data QC procedure had been proposed in the framework of various national and international projects. Our QC procedure is based on the experience of such projects as WOD; MEDAR/MEDATLAS II; NATO TU BLACK SEA, SEADATANET, Black Sea Scene, EMODNET, and others. We also paid attention to recommended by IOC UNESCO procedures for validation of oceanographic data. The way of increasing reliability of the quality control procedure is to use climatic arrays prepared by specialists in regional oceanography of the Black and Mediterranean seas as well as standard check arrays. The QC procedure includes metadata and data quality tests. The metadata tests are:

- location check,
- date/time (including velocity and chronology) check,
- sea depth/last sounding value check.

The data tests include

- sounding value check (including order check),
- climatic check (if climatic arrays for the parameter are available),
- statistic check (if statistic arrays for the parameter are available),
- range check (if ranges for the parameter are available),
- fixing density inversions for hydrological data,
- fixing spikes (if corresponding thresholds for the parameter are available),
- gradient check (if corresponding thresholds for the parameter are available).

The QC software implements a procedure of data quality control for SDN and ODV spreadsheet files, assigns QC flags to metadata and data values, creates a log file with a list of possible data and metadata errors, provides metadata and data errors navigation and visualization, and gives a possibility of erroneous value correction.
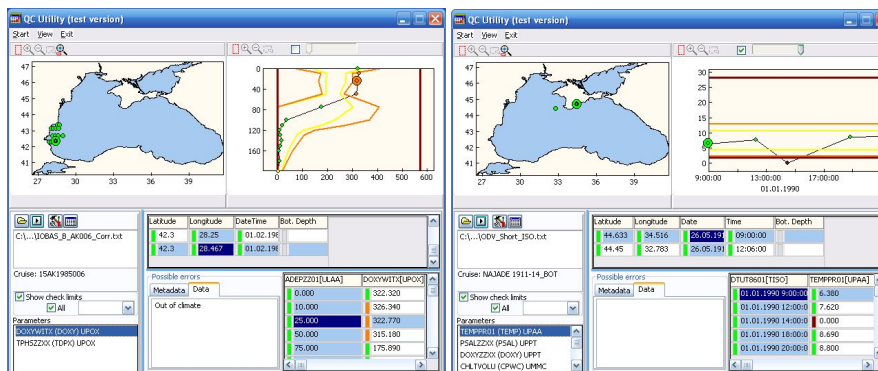

Fig1. The examples of QC results visualization for profile and time series

The QC software offers interactive tools for setting of the QC procedure. They allow

- selecting QC tests and their parameters;
- adding shore line and relief data arrays for metadata quality control;
- adding sub-regions and check arrays for data quality control;
- adding connections between parameters and check arrays as well as units conversion coefficients.

Climatic and statistic arrays

The QC procedure uses mostly check arrays which are widely applied for data quality control in international oceanographic research projects. At the same time temperature, salinity and oxygen climatic arrays for the Black sea region were prepared by specialists of Marine Hydrophysical Institute. Climatic characteristics (mean and mean standard deviation) were calculated for temperature, salinity and oxygen. The sub-region scheme of 40×60 minute (40×40 mile) squares accounting spatial variability of hydrological parameters was used. The sub-regions for the Mediterranean Sea were taken from the MEDAR.MEDATLAS II and SeaDataNet2 projects. Certain squares with considerable spatial variability were divided into 4 parts and the climatic characteristics were calculated for each of them. The climatic arrays for temperature and salinity were prepared for each month and for oxygen – for each season. Moreover, a number of statistic annual averaged arrays for several parameters in the Mediterranean and Black seas were prepared.