



## **Web based tools for data manipulation, visualisation and validation with interactive georeferenced graphs**

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Some of oceanographic parameters have to be manually inserted into database; some (for example data from CTD probe) are inserted from various files. All this parameters requires visualization, validation and manipulation from research vessel or scientific institution, and also public presentation. For these purposes is developed web based system, containing dynamic sql procedures and java applets.

Technology background is Oracle 10g relational database, and Oracle application server. Web interfaces are developed using PL/SQL stored database procedures (mod PL/SQL). Additional parts for data visualization include use of Java applets and JavaScript.

Mapping tool is Google maps API (javascript) and as alternative java applet. Graph is realized as dynamically generated web page containing java applet. Mapping tool and graph are georeferenced. That means that click on some part of graph, automatically initiate zoom or marker onto location where parameter was measured. This feature is very useful for data validation.

Code for data manipulation and visualization are partially realized with dynamic SQL and that allow as to separate data definition and code for data manipulation. Adding new parameter in system requires only data definition and description without programming interface for this kind of data.