



Utilizing Free and Open Source Software to access, view and compare in situ observations, EO products and model output data

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The GreenSeas project (Development of global plankton data base and model system for eco-climate early warning) aims to advance the knowledge and predictive capacities of how marine ecosystems will respond to global change. A main task has been to set up a data delivery and monitoring core service following the open and free data access policy implemented in the Global Monitoring for the Environment and Security (GMES) programme.

The aim is to ensure open and free access to historical plankton data, new data (EO products and in situ measurements), model data (including estimates of simulation error) and biological, environmental and climatic indicators to a range of stakeholders, such as scientists, policy makers and environmental managers. To this end, we have developed a geo-spatial database of both historical and new in situ physical, biological and chemical parameters for the Southern Ocean, Atlantic, Nordic Seas and the Arctic, and organized related satellite-derived quantities and model forecasts in a joint geo-spatial repository. For easy access to these data, we have implemented a web-based GIS (Geographical Information Systems) where observed, derived and forecasted parameters can be searched, displayed, compared and exported. Model forecasts can also be uploaded dynamically to the system, to allow modelers to quickly compare their results with available in situ and satellite observations.

We have implemented the web-based GIS (Geographical Information Systems) system based on free and open source technologies: Thredds Data Server, ncWMS, GeoServer, OpenLayers, PostGIS, Liferay, Apache Tomcat, PRtree, NetCDF-Java, json-simple, Geotoolkit, Highcharts, GeoExt, MapFish, FileSaver, jQuery, jstree and qUnit. We also wanted to use open standards to communicate between the different services and we use WMS, WFS, netCDF, GML, OPeNDAP, JSON, and SLD.

The main advantage we got from using FOSS was that we did not have to invent the wheel all over again, but could use already existing code and functionalities on our software for free:

- Of course most the software did not have to be open source for this, but in some cases we had to do minor modifications to make the different technologies work together.
- We could extract the parts of the code that we needed for a specific task. One example of this was to use part of the code from ncWMS and Thredds to help our main application to both read netCDF files and present them in the browser.

This presentation will focus on both difficulties we had with and advantages we got from developing this tool with FOSS.