Geophysical Research Abstracts
Vol. 13, EGU2011-11545, 2011
EGU General Assembly 2011

Quality comes first in system design

Pekka Alenius (1), Riikka Hietala (1), Kimmo Tikka (1), Seppo Kaitala (2), Sanna Kujansuu (2), Riitta Olsonen (2), Ilkka Priha (3), and Mikko Virkkunen (3)

(1) Finnish Meteorological Institute, Helsinki, Finland (pekka.alenius@fmi.fi), (2) Finnish Environment Institute, Helsinki, Finland (riitta.olsonen@ymparisto.fi), (3) Simsoft Oy, Espoo, Finland (mikko.virkkunen@simsoft.fi)

Introduction

Good quality data is only possible if the whole data management system is based on quality. In present marine research there is a continuous need for rapid insight into data of different disciplines from several sources. Quick and easy visualization from many perspectives is a way to good quality and profound interpretation of the data. Near real-time data access and data storing to databases onboard and at land already during the research cruises is a way to quality data production and to efficient use of research ships.

Development process and system structure

Our experiences on developing marine data systems have shown the power of agile method. In such a method, the experienced data users and system developers are in continuous contact and develop in co-operation the system in a modular way. Agile system development has produced working prototypes quickly and has made possible to respond immediately to new user needs. With such a method it is possible to avoid dead end system development.

The core idea is to have a modular system that supports quality data processing from planning of data collection to data reporting and interpretation. We built our system around research ship(s) and ships of opportunity making use of existing systems like Alg@Line. The modules include cruise planning, data storing onboard, nearly real-time automated data replication from onboard databases to institute databases, automatic standard product development into Internet and flexible user interface to data, the scientist's desktop. Technologies that have been used in building the modules of the system include Java, Adobe Flex and Delphi developer tools, InnoLIMS laboratory information management system and MySQL and MS-SQL Server database systems. Instead of being forced to put all the data into a common database, the system is able to use existing databases and integrating them into a single user interface. Thus we have been able to integrate e.g. physical-chemical databases with biological databases and databases from different institutes. Integration of new databases to the system has shown to be easy, taking less than one man-month per database.

Common standards

Common vocabularies and standards in presenting geographical coordinates and dates and times are important in developing such a system. Biological data management and maintenance of species lists have been special challenges for system development. We have successfully integrated the species list work by HELCOM Phytoplankton Expert Group into our system. For the species list, the history tracking ability of the system is of vital importance.

Data availability to users

The system is up and working. Alg@Line data from ships of opportunity goes once an hour to database on land and R/V Aranda data goes into on-land database at least once a day during cruises. These data are readily available to users at FMI and SYKE through scientist's desktop (SDT), which is an interactive web application (RIA, rich internet application). SDT visualizes data from several databases and many perspectives at the same time in dynamically linked multiple user configurable views like time series, vertical profiles, seasonal view and parameter versus parameter charts. A rapid usage of the data is an essential part of the quality control. Our system feeds data to SeaDataNet, MyOcean and Baltic Nest Institute. Quality data forms a firm basis for monitoring, research and decision making.