

Recent developments in oceanographic data and information system for Polish NODC initiative

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Polish NODC initiative

Some of the Polish scientific organizations, among others the Institute of Oceanology Polish Academy of Sciences, Institute of Meteorology and Water Management National Research Institute, Polish Geological Institute National Research Institute, National Marine Fisheries Research Institute, University of Gdańsk, Gdańsk University of Technology, Maritime Institute of Maritime University in Gdynia, Pomeranian Academy in Słupsk and University of Szczecin, being involved in marine research for a long time have consolidated their efforts and undertook actions to make Polish oceanographic scientific data resources accessible for public from one national repository recently. These organizations having got well established good international cooperation, being members of international projects, organizations, and committees i.e. SeaDataNet, GeoSeas, EuroGOOS, BOOS etc., provide data separately to ICES, EMODNet and other well recognized international data and information centers and systems so far.

In order to increase Polish input to pan European oceanographic databases infrastructure – SeaDataNet, the idea arose to join efforts and to establish the structure of the Polish National Oceanographic Data Committee some years ago. One of the goals of the first stage of the Polish NODC development plan is to build an infrastructure as a solid basis for future administrative structure of this NODC. Such opportunity appeared thanks to the present Digital Agenda Poland.

Consortium comprising IO PAN, IMUMG, PGI PIB, MIR PIB, UG, APS, US - 7 of mentioned above partners, has successfully submitted project proposal in the frame of the Digital Agenda Poland programme dedicated for scientific organizations and is heading to provide open access to the scientific data resources. The consortium has been awarded for the project eCUDO.pl (Oceanographic Data and Information System). The project aims to harmonize Polish oceanographic data release and open access, make them interoperable through implementation of committed standards for information structure and communication protocols INSPIRE compliant. The project intends to develop and deploy distributed infrastructure for data management, and providing of FAIR and open access to oceanographic data resources.

Present activities encompass harmonization of environmental data collection and its preservation in accordance with INSPIRE requirements and SeaDataNet standards, securing resources for data management and stewardship, as well as digitalization of hardcopy data archives. The most significant results as expected, are better data discovery findability, accessibility, interoperability and finally higher potential for reuse of data as collected during the years of research activity and for the time being accessible only for internal purposes of the data originators.

eCUDO system development

Design of the system according to the programme requirements is user oriented and driven by development of services demanded by perspective users of the system. Except the access for

“human” users of the system (including scientists, industry, administration, education, NGOs and general audience) and WCAG2.1 compliant interface of the system, the most expected data traffic with growing throughput in the near future is that generated by automated systems, both effected from metadata and data replication with other data centers, but variety of small but numerous autonomic systems (IoT). For this purpose extended M2M interfaces have to be developed. System is designed to meet 5 Star Open Data Model as well.

The system itself needs to be flexible and scalable. Oceanographic data is acquired and processed by many units and is distributed by their nature. Organizations engaged into system development are used to exploit data management infrastructures they have already deployed for their own purposes. These solutions are based on different technologies and every local instance of the system has to interface to these existing solutions, but provide unique access conditions and information structure on upper layer of data provisioning. Volume of data growth is correlated with sensor technologies development and is expected to growth exponentially in the future, as well as demands for data and number of data requests.

To meet these requirements design of the system base on hyper-convergent infrastructure according to this presented on Fig. 1.

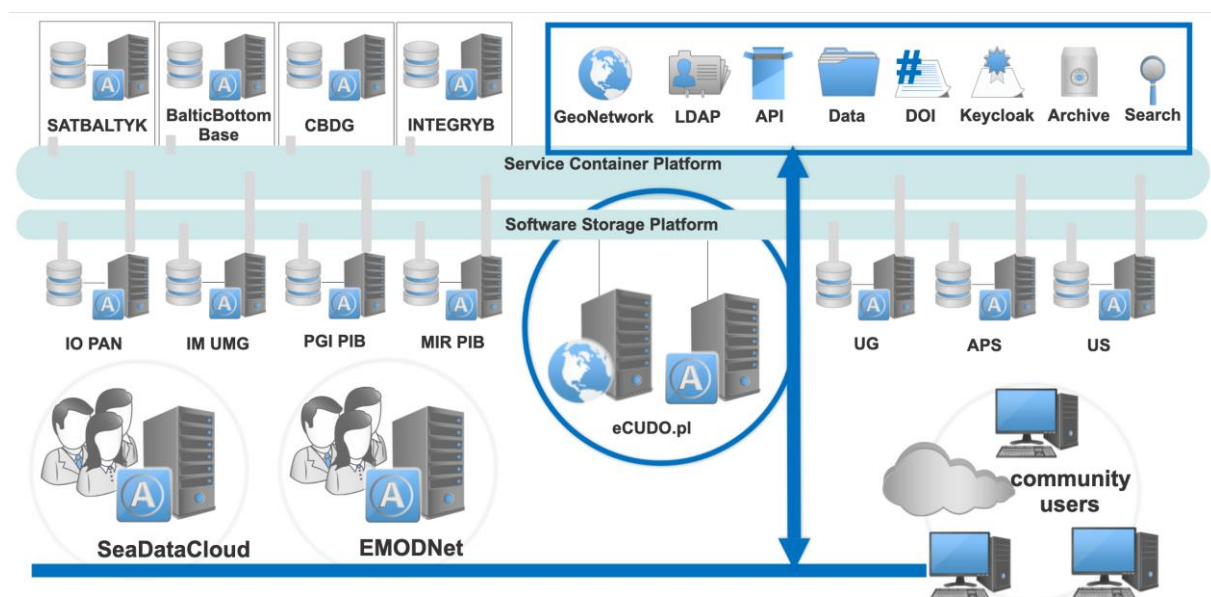


Figure 1: General design of the eCUDO system.

Conclusions

Development and deployment of the unified system providing access to distributed data resources as managed by the key scientific oceanographic institutes in Poland will trigger and provide added value for national economy through increase of data availability for all levels of administration, with simultaneous decrease of the total cost of data acquisition, management and exchange.

Unified data formats and protocols will boost the development of the services based on environmental data. Advanced services provided for clients (including data analysis services) extend availability of oceanographic data both to Polish and European organizations.

System will be open for all stakeholders and ready to accommodate other organizations and their data sources. Up to now cooperation has been agreed with Ministry of Climate, Ministry of Maritime Economy and Inland Navigation – System for Spatial Information of Maritime Authorities, as well as with the Institute of Meteorology and Water Management NRI.