River data management for coastal oceanography

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I.   INTRODUCTION

Rivers are the major pathways for material fluxes from land to sea. They supply nutrients and sediments to marine ecosystems, whereas riverine freshwater supplies largely affect the coastal and offshore circulation of oceanic systems. Unfortunately, most of the river data is fragmented and not accessible. In this paper, we describe the results from a joint European cross-cutting action between EMODnet Physics and the LAMBDA project for making river data available, accessible, downloadable and usable. In the framework of EMODnet Physics and SeaDataNet NODCs have started designing the workflow for long term river data (for oceanography) management.

a. EMODnet Physics

EMODnet Physics (www.emodnet-physics.eu) is one of the seven domain-specific portals of the European Marine Observation and Data Network (EMODnet). EMODnet-Physics map portal (www.emodnet-physics.eu/map) provides a single point of access to in situ datasets, products and their metadata.

b. EMODnet Data Ingestion

The EMODnet Data Ingestion portal facilitates data producers and managers to ingest their marine datasets for further processing and publishing as open data. In particular, it contributes to identify new data sources and define the management flow of this new typology of data. Its role is central also for providing a standard codification for formats; conventions and modalities of dataset management, making the system easily accessible form other programs, such as Copernicus.

c. CMEMS SE - LAMBDA

The LAMBDA project (http://www.cmems-lambda.eu/) aims to improve the CMEMS MFCs thermohaline circulation in coastal areas by a better characterisation of the land-marine boundary conditions, with special regard to the salinity fields, through exploring the capacities of watershed numerical modelling and its coupling to mesoscale regional ocean models.

II.   FIND, ACCESS, INTEROPERATE, REUSE DATA AND PRODUCTS

Usually, river data are managed by local environmental agencies and despite the fact that some are making data (water level along the river) accessible, the fragmentation of the sources and the variety of the data formats and naming conventions limit the usability of the data. To overcome this harmonization of both data transport format and naming conventions are needed and to set up a single point of access for this federated network of sources. The EMODnet Physics-LAMBDA working group have defined common standards to manage the data flow and make it accessible and visible.

a.   Data conventions and data management

Transport file is NetCDF v3.6 (and v.4.0), data is stored in a data server according data age. CF convention/SeaDataNet P09 are used for parameters. Data access and services

b. Data access and service

EMODnet Physics has developed a dedicated page for each river station and provides the user with metadata and the latest data chart. Features to download data and search for longer and older time series are also offered. Once integrated in EMODnet, data are made available under the EMODnet Physics M2M interfaces

Figure 1: Example of river data plot

The LAMBDA project provides the user with reanalysis river data (river flow and temperature) from 1992 to 2020 and forecast. This dataset is helpful for CMEMS MFCs reanalysis simulations. The project also provides remote salinity SMOS products focussing on coastal river inputs.
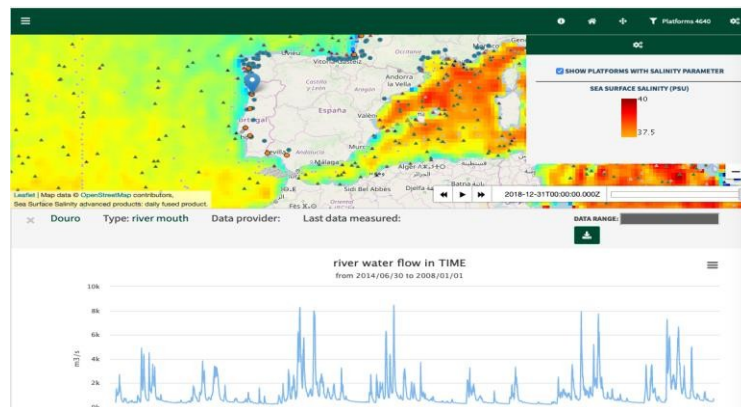

Figure 2: Capture of LAMBDA project data portal (http://www.cmems-lambda.eu/mapviewer/)

The possibility to access harmonized river flow data from a single point is enabling new possibilities and new features in operational services and river management projects. While LAMBDA is collaborating with the CMEMS MFCs in order to run specific model sensitivity tests focused on evaluating the potential impact of using LAMBDA products in model applications analogous to the ones used in their operational forecast services, other projects e.g. HazRunoff (http://www.hazrunoff.eu/) are adopting the data stream for early warning & detection, follow-up, and early response to different or combined types of flooding and hazmat pollution in inland and transitional waters.

III.   CONCLUSIONS

The need for river data management for coastal applications and coastal oceanography represents a key emerging topic and users welcome an easy and innovative service supporting their daily activities. Results will be presented on progress made in making river data available, accessible, downloadable and usable.