Demonstrator Prototype and Initial Marine Indicators

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Objective

Development of the service Marine Environmental Indicators

- To calculate and distribute online information and indicators on the environmental quality of the marine area
- Obtain new added value data applying big data analysis and machine learning methods on the multi-source data sets
- Enable users to perform on line and on the fly operations such as selecting portion of a dataset, to perform statistical analysis or display the data
Target Audience

EU Marine Strategy Framework Directive

- Conserve and sustainably use the oceans
- Goals in 14 targets

Blue-Cloud
Demonstrator 3 - Version 1
Demonstrator 3 – Version 2

Blue-Cloud Marine Environmental Indicators Webinar, 04-12-2020
design based on requirements indicated by Environmental Agencies

Bringing innovation, data, resources and expertise, into a unique service

Prototype Web User Interface allows the user to:
- select a portion of input data for a specific area and period of time
- Generate new added value data
- displaying the generated added value data by tables, map and graphics visualizations
Data Source

In the available prototype a sample input dataset is available for the period 1987-1989 – same data format of the CMEMS data source.
Generated Added Value Data

Catalogue of Algorithms
- Monthly Mean
- Annual Mean
- Monthly Climatology
- Annual Climatology
- Monthly Mean
- Annual Mean
- Monthly Climatology

Maps

Time-series

Output Environmental Fields
- Temperature
- Salinity
- Water Density
- Kinetic Energy
- Currents

Blue-Cloud Marine Environmental Indicators Webinar, 04-12-2020
Access to the VLab

https://blue-cloud.d4science.org/web/marineenvironmentalindicators/
Selection of the Data Source

Available data source are selectable in [a]

In this version the available data source is the product MEDSEA_REANALYSIS_PHY_006_004 from CMESM catalogue. A local copy of a 3-year (1987-1989) sample input dataset is available inside the VRE
Selection of the Output Data

Several output types are selectable in [b], while [c] presents the applicable output fields.

The user can choose the type among the several possible mean maps, time-series and climatologies, and the field of interest.
Selection of the Time

Depending on the selected output type, the interface will require the insertion of specific information to define the time of interest in [d]...

The example in this slide reports the insertion of a starting month/year and a final month/year...
## Time Specification

<table>
<thead>
<tr>
<th></th>
<th>Month</th>
<th>Year</th>
<th>MM/YYYY – MM/YYYY</th>
<th>YYYY - YYYY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monthly Mean Map</strong></td>
<td>January</td>
<td>1987</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Annual Mean Map</strong></td>
<td>n.a.</td>
<td>1989</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Monthly Climatology Map</strong></td>
<td>February</td>
<td>n.a.</td>
<td>n.a.</td>
<td>1987 - 1989</td>
</tr>
<tr>
<td><strong>Annual Climatology Map</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>1987 - 1989</td>
</tr>
<tr>
<td><strong>Monthly Mean Time-series</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>01/1987 – 12/1988</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Annual Mean Time-series</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>1987 - 1989</td>
</tr>
<tr>
<td><strong>Monthly Climatology Time-series</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>1987 - 1989</td>
</tr>
</tbody>
</table>
Selection of the Geographical Domain

Always possible to select the lon/lat area [e] and the depth layer [f] of interest

Submission of the job [g]
### My Data Section

Each User has a private MyData Section in which the submitted jobs are available. When a job execution is complete, from here it is possible to access the new available data.

#### Presented Information

**Related the Job**
- Creation time
- Status
- Output

**Related the Output Data**
- Data Source
- Type and Env. Field
- Area and Depth Layer
- Time Range

### Table: Job Execution Details

<table>
<thead>
<tr>
<th>Creation Time</th>
<th>Status</th>
<th>Data Source</th>
<th>Type</th>
<th>Area (Unit)</th>
<th>Depth (Unit)</th>
<th>Time Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020-10-10T15:50:00</td>
<td>started</td>
<td>MEDSEA_REANALYSI_PHYS,006,004</td>
<td>annual mean timeseries - salinity</td>
<td>[34.5,40.5]</td>
<td>[1.5,3.5]</td>
<td>1980 - 1989</td>
</tr>
<tr>
<td>2020-10-10T15:50:00</td>
<td>completed</td>
<td>MEDSEA_REANALYSI_PHYS,006,004</td>
<td>monthly mean timeseries - temperature</td>
<td>[34.5,40.5]</td>
<td>[1.5,3.5]</td>
<td>1987-61 - 1987-66</td>
</tr>
<tr>
<td>2020-10-10T15:50:00</td>
<td>completed</td>
<td>MEDSEA_REANALYSI_PHYS,006,004</td>
<td>monthly climatological timeseries - density</td>
<td>[34.5,40.5]</td>
<td>[1.5,3.5]</td>
<td>1988 - 1989</td>
</tr>
<tr>
<td>2020-10-10T15:50:00</td>
<td>error</td>
<td>MEDSEA_REANALYSI_PHYS,006,004</td>
<td>annual mean timeseries - salinity</td>
<td>[34.5,40.5]</td>
<td>[1.5,3.5]</td>
<td>1987 - 1989</td>
</tr>
</tbody>
</table>
Access to the Data

When the execution is successful completed, it is possible to:

- See a static plot [a] of a map or a time-series
- Download the data as file in NetCDF format [b]
- Download the log information related the execution [c]
Conclusion

- Data from existing EU data sources are integrated into a unique service
- An online flexible analysis tool is facilitating the users to display and generate new added-value data to assess the environmental quality of marine areas

Perspective

- New data sources will be made available
- Additional scientific based algorithms will be developed and made available
- Further development of the interface for the user interaction and visualization of data