

BIO-OPTICS FOR OCEAN COLOR REMOTE SENSING
OF THE BLACK SEA
(Black Sea Color)

TN7 Description of the portal

<i>Workpackage:</i>	<i>5</i>	<i>Web portal development</i>
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Programme for European Cooperating States (PECS)

ESA contract №4000123951/18/NL/SC

TN7 Description of the portal

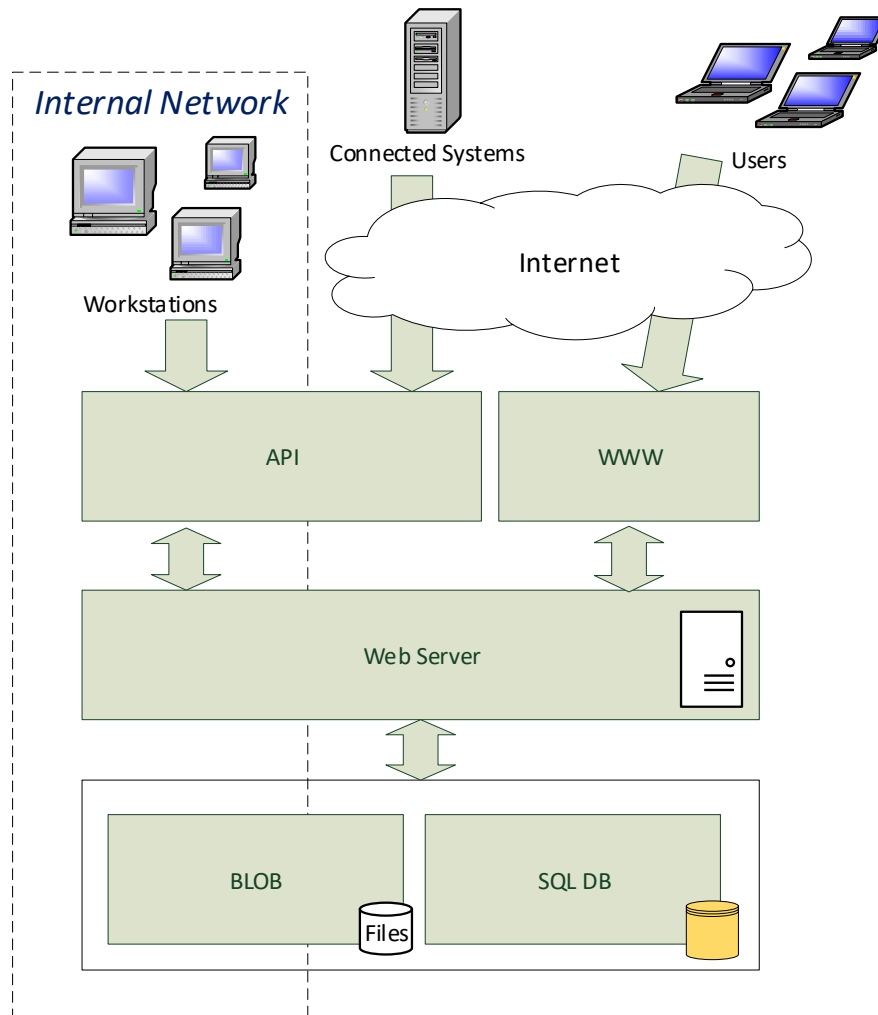
Document Log

<i>Date</i>	<i>Author</i>	<i>Changes</i>	<i>Version</i>	<i>Status</i>
<i>04.01.2020</i>	<i>N. Ilhanov</i>		<i>V1.0</i>	<i>Draft</i>
<i>10.01.2020</i>	<i>Prof.A. Palazov</i>	<i>Revisions</i>	<i>V1.1</i>	<i>Draft</i>
<i>21.02.2020</i>	<i>N. Ilhanov</i>		<i>V1.2</i>	<i>Completed</i>

1. High level architecture

Classical three-layered architecture could satisfy the needs of the Products portal with the following specifics:

- Products inserting will be performed in the internal network from a desktop workstations to use the full advantage of the internal network and speed up the process;
- The system could expose an API endpoints for connection with external systems;
- Product data will be available through the internet;
- A BLOB Storage will manage image data and supporting files;
- An SQL (or even NoSQL) Database will be used for descriptive information and will be primary point for result filtering, sorting and paging



The give architecture could be fulfilled with variety of technologies. For example:

BLOB Storage could be implemented as:

- Azure BLOB
- Server's File System
- CDN Server
- FTP Server

SQL DB could be:

- Azure SQL
- Dedicated SQL Server
- NoSQL service like Cosmos, Mongo etc.

Web Server could be hosted in:

- Microsoft Azure
- Amazon Web Service
- In a local data center

APIs and Web services could be implemented by using:

- ASP.NET MVC
- ASP.NET Core

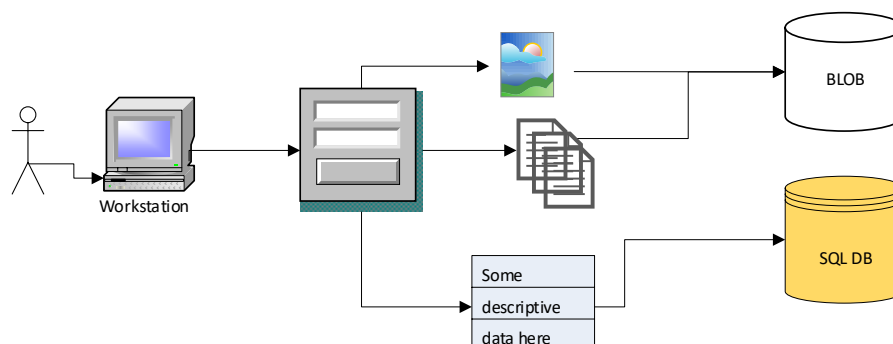
Users should be able to use their browsers on their:

- Personal computers
- Tablets
- Phones

Potentially the given architecture could be extended vertically and horizontally if needed.

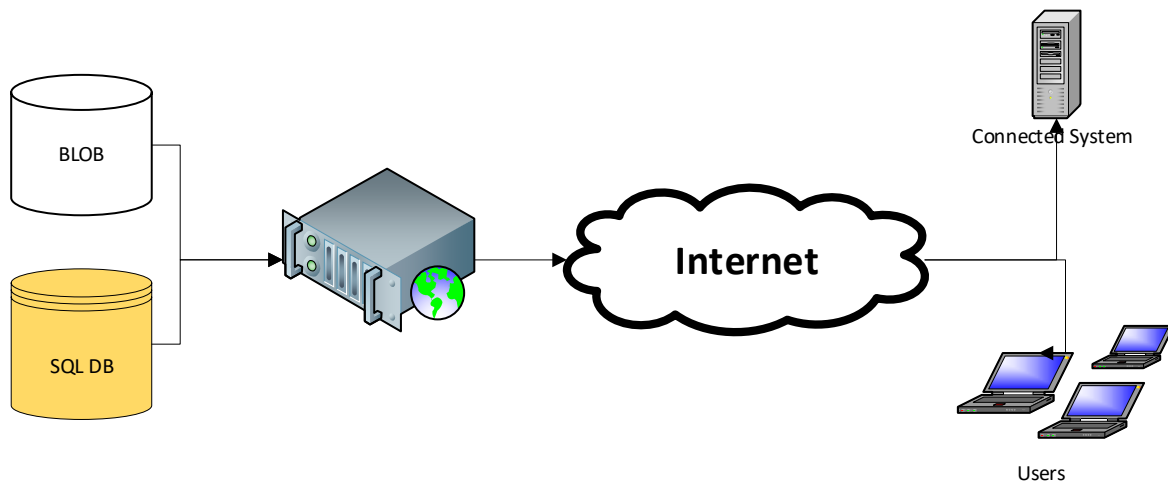
2. Products Inserting

The scientist/operator will perform necessary data collection and extracting and will use a specialized desktop UI for preparing and inserting all Product-related data in the SLQ DB and BLOB/File storage.



3. Products Providing

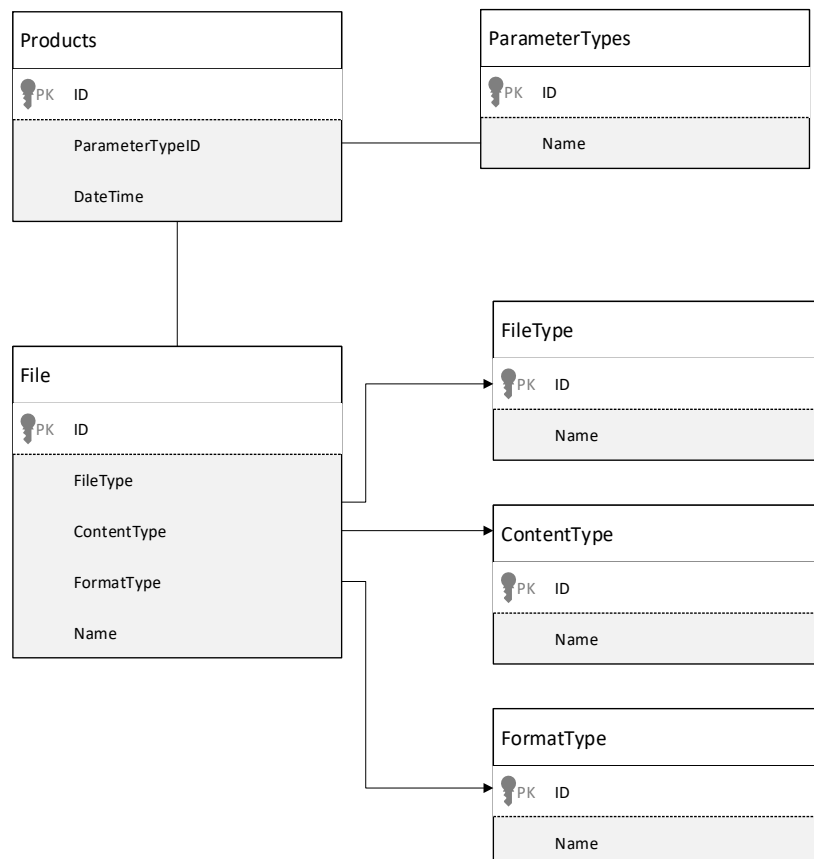
The Product portal will be accessible from the internet. Optionally an API endpoints could be provided for serving products to external systems.



4. SQL – BLOB interaction

The SQL DB should know the BLOB/File storage and will keep information of how the files could be accessed.

5. Conceptual Data model



Products is the main entity and will be entry point for all related data.

ParameterTypes could be:

- Chlorophyll concentrations
- Total suspended matter
- Defuse attenuation at 490 nm
- Coloured Detrital and Dissolved Material absorption coefficient at 443 nm

FileTypes could be:

- Image
- CSV
- Document

ContentType is supporting and could store values like:

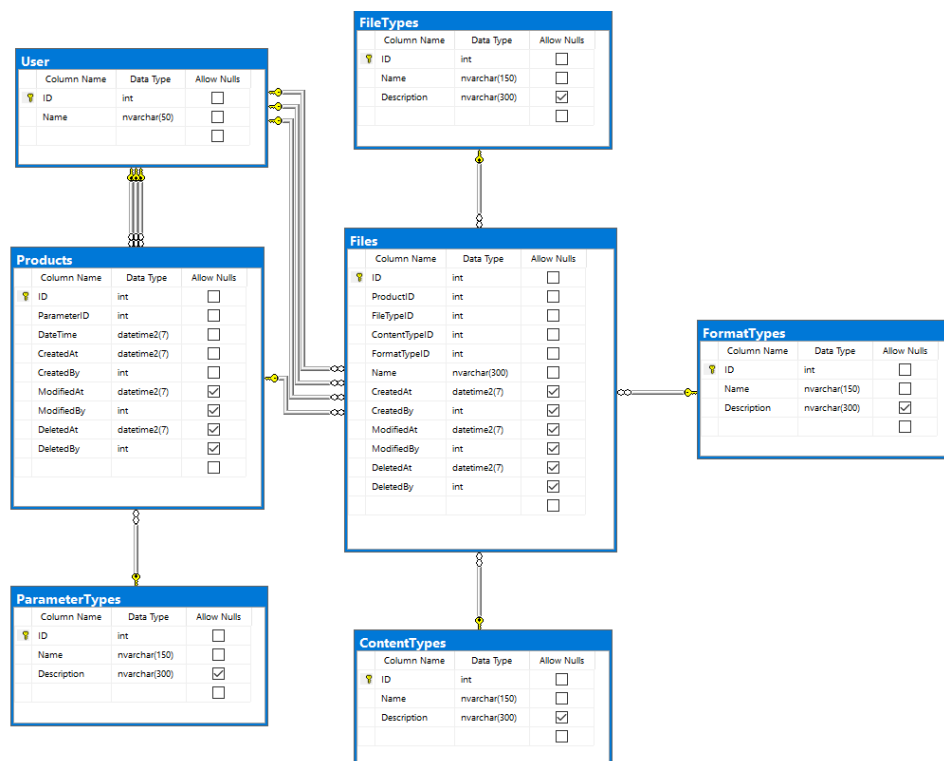
- Data
- Raw
- Metadata

FormatType lists the available formats of the files:

- ASCII

6. SQL Data model

A very initial relational data model could look like this:



It could be extended with Roles and Tags (FileTags, ProductTags) for instance.

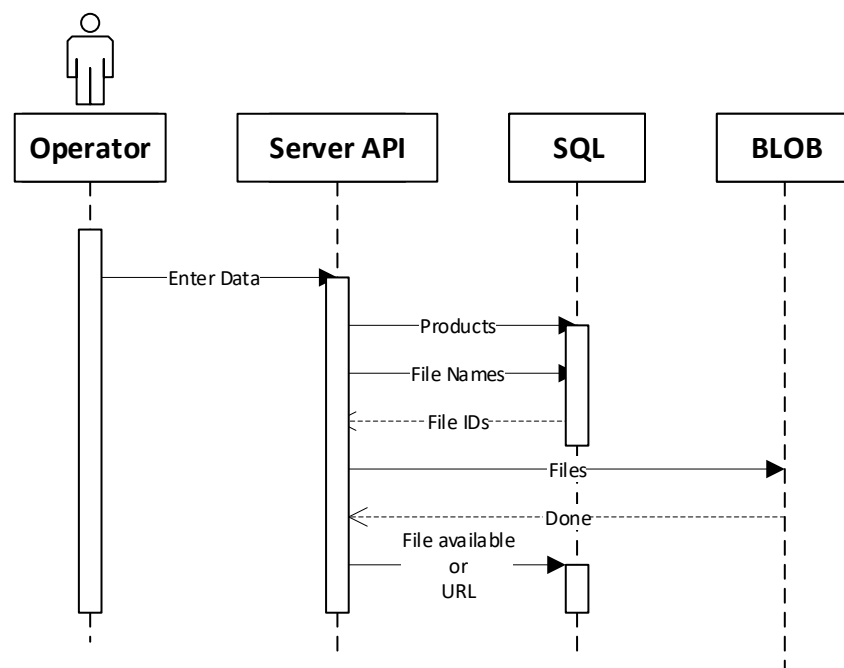
This model could work equally well on both CodeFirst and DB First approaches.

7. Supporting Data Storages

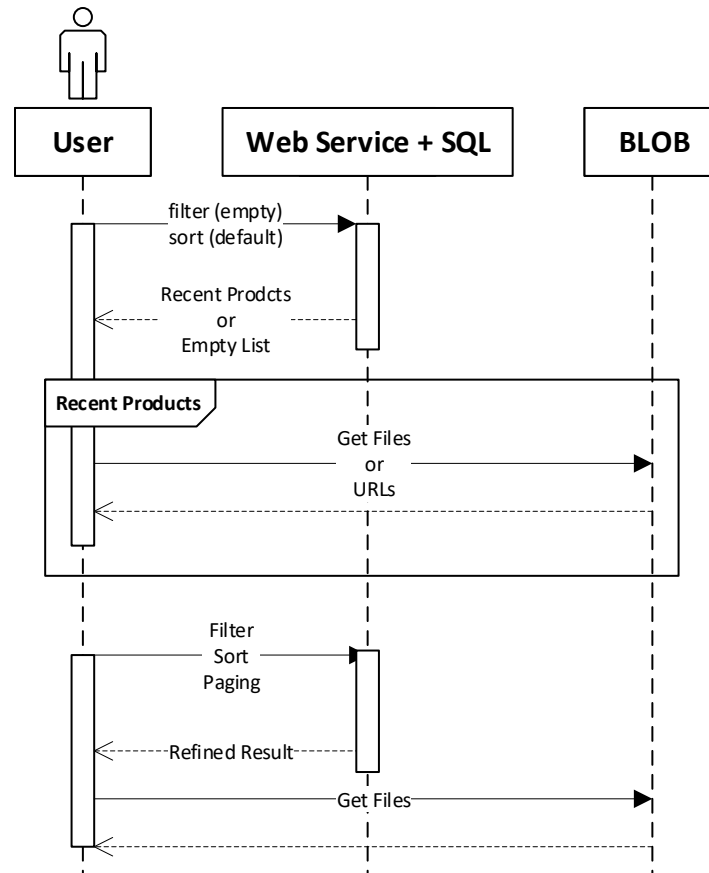
The system will keep various supporting data like:

- Audit logs
- System logs
- Statistical information

8. Simple Insert Workflow



9. Simple Usage Workflow



Communication will be initiated with a set of:

- Filter criteria – Date Range, Parameter type, Search strings etc.
- Sort options – by Parameter name, Date, etc.
- Paging options and status. It contains:
 - Current page
 - Page size

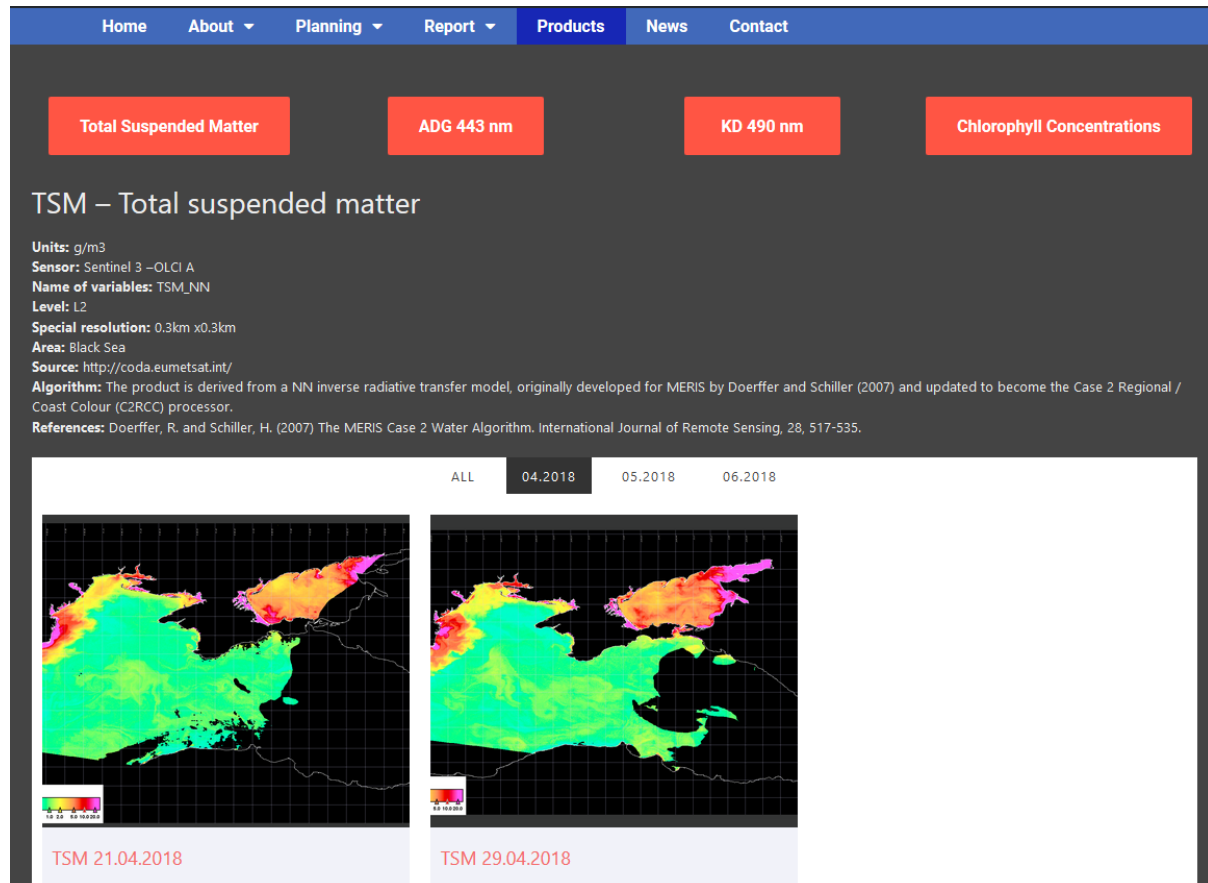
Proof of Concept

To demonstrate feasibility, to prove that the system is deliverable and to clarify some aspects related to the usability and detail depth a POC portal with Products gallery was implemented.

The BS Color portal is capable to present Products that combine processed data, measured in the sea and color images made from the space. The portal has the ability for searching and filtering and provide different depth of details on both data and graphical representation at any given parameter in concrete date and geographical area.

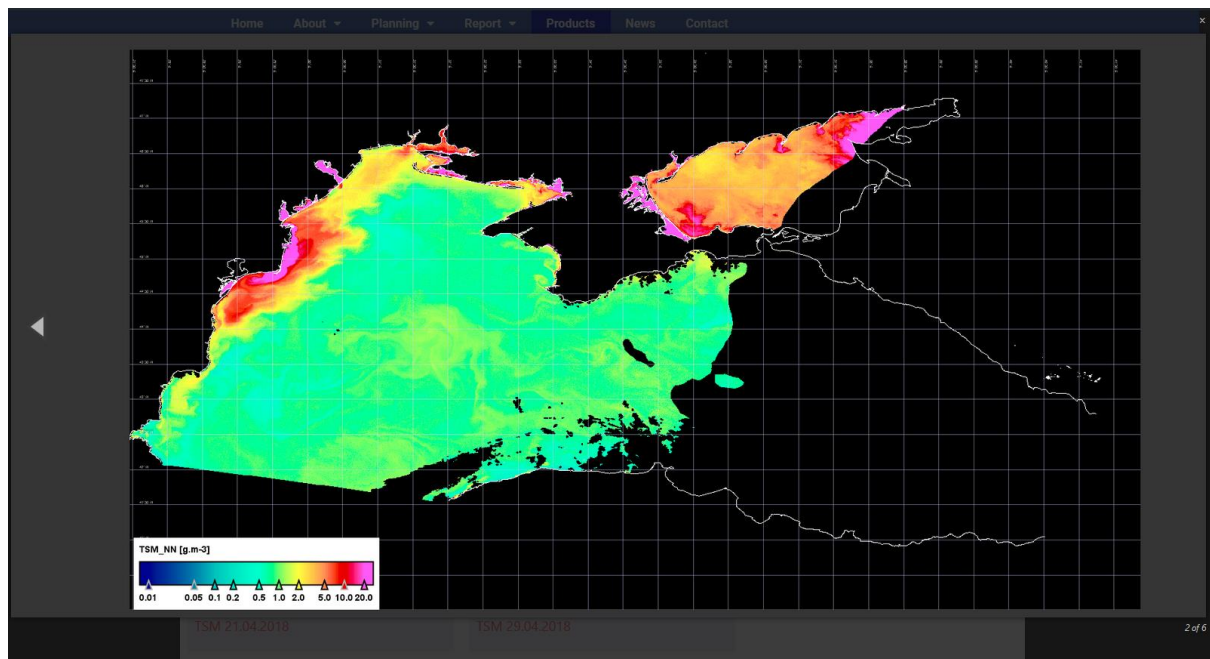
The portal itself represents a modern widely accessible media, based on the latest trendy technologies and can serve in a broad range of users. It's backend by a powerful and flexible

Content Management System (CMS) that is placed and usable worldwide. It was chosen wisely in order to satisfy the needs of presenting data in a useful manner, full-fill the tradeoff between development effort, time and features, and the easy way of management by providing familiar and self-explanatory User Interface (UI) for both – usage and management.



The BS Color portal is driven by an internally administrated and hosted Wordpress CMS, that comes with its built-in architecture and ready to use functions. It also provides an integrated user management system and media management backed by a Database (DB) and a web server. The modern look and fill is achieved by using a dedicated plugins, that also decreased development effort.

The Products Page, in particular, represents a gallery with several layers of details with the ability of rich text and visual formatting to increase the readability and satisfy the requirements for content presentation and usability:



The true power of the Portal and especially of the Products sub system is its management ability. With its flexibility and easy to use interface anyone could insert, extend and tune the related data. This is valid for the behavior and user experience too:

Edit EA Filterable Gallery

Use the gallery control name from Control Settings. Separate multiple items with comma (e.g. Gallery Item, Gallery Item 2)

Item Name
 TSM 31.05.2019

Enable Price? ☐

Enable Ratings? ☐

Enable Category? ☐

Item Content

Add Media Visual Text

Paragraph **B** **I** **U**

Total suspended matter (TSM) is an important indicator of water quality and has an adverse effect on light propagation in the water affecting the primary production.

Image

Gallery Lightbox Button? ☒

Gallery Link Button? ☒

Total suspended matter

Units: g/m³
 Sensor: Sentinel 3 - OLCI A
 Name of variables: TSM_NN
 Level: L2
 Special resolution: 0.3km x0.3km
 Area: Black Sea
 Source: <http://codaeumetsat.int/>
 Algorithm: The product is derived from a NN inverse radiative transfer model, originally developed for MERIS by Doerffer and Schiller (2007) and updated to become the Case 2 Regional / Coast Colour (C2RCC) processor.
 References: Doerffer, R. and Schiller, H. (2007) The MERIS Case 2 Water Algorithm. International Journal of Remote Sensing, 28, 517-535.

ALL 04.2018 05.2018 06.2018

TSM 21.04.2018 TSM 29.04.2018

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The management interface is separated in its level of details granularity and also keep combined data stacked together:

