

Application of CHARMe in satellite based climate monitoring

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CHARMe (Characterization of Metadata to enable high-quality climate applications and services) as a GMES/Copernicus-project was supported by the EU-FP7 (SPACE) programme and is a contribution towards a European Climate Service. It aims at connecting users and prospective users of climate datasets with the previous expertise that has accumulated in the community, and enabling them to contribute back information on their own experience. It also provides direct traceability between conclusions and the data that supported them. One example of the application is the implementation of the plug-in developed within the project at the EUMETSAT Satellite Application Facility on Climate Monitoring.

CHARMe System

The CHARMe system is an online system for collecting and sharing user experiences and feedback on climate data records. It has the following primary components in order to work for the system:

- A data provider's host system, where the data is stored and from which CHARMe is linked to.
- The CHARMe node, which stores the commentary metadata relating to the data on the host system.
- The CHARMe plug-in, which is the primary way to access and modify the commentary metadata stored on the CHARMe node. The plug-in is available via the CHARMe webpage at <http://www.charme.org.uk>
- The CHARMe tools which provide advanced functionality using direct access to the CHARMe node.

How CHARMe works



The CHARMe system provides links between datasets and citations and other commentary information following the principles of the "Semantic Web" and "Linked Data" by applying open standards such as Open Annotation. This approach is highly flexible and can adapt to changing user needs as the system grows.

Open Annotations

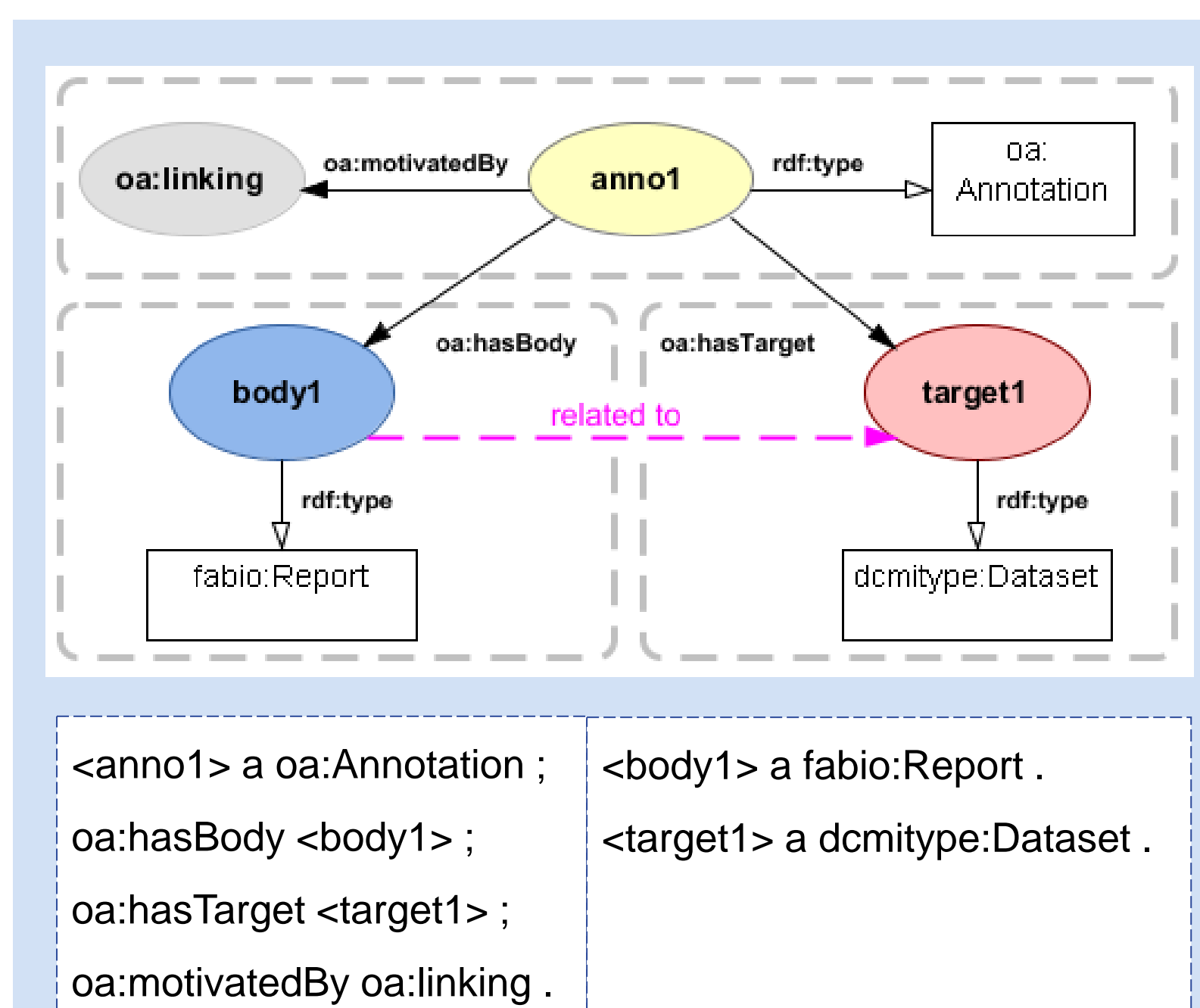


Figure 1: Open Annotation data model

Open Annotation is an overall framework to associate a piece of information with a certain subject. Within CHARMe, it can be used to associate a dataset with a user comment about that dataset. It will allow users to record the motivation behind an annotation and to tag a resource.

Using Open Annotation for collecting and sharing user experiences and feedback on climate datasets helps users to judge how suitable such climate data are for their own intended applications.

CHARMe enabled CM SAF

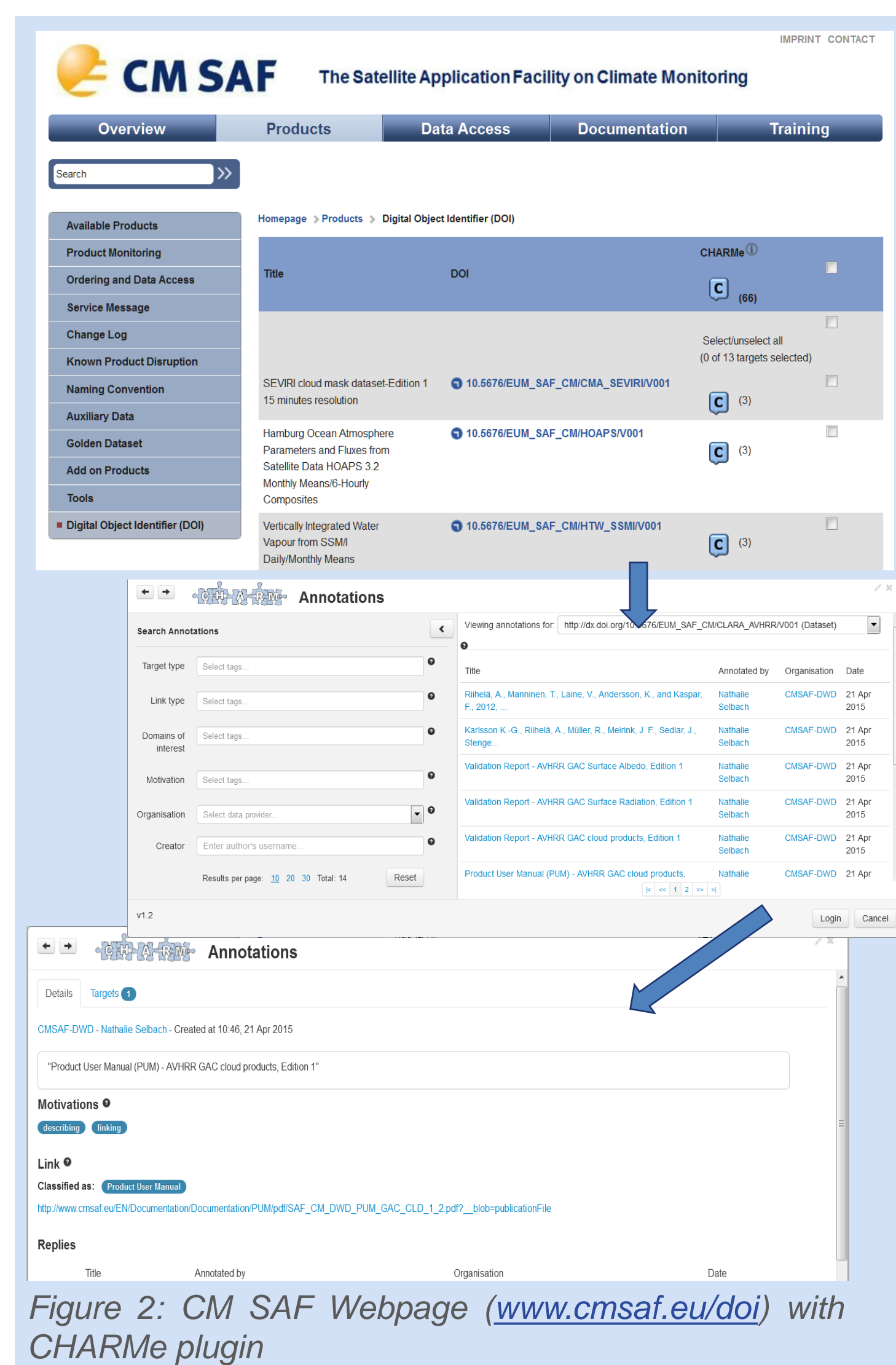


Figure 2: CM SAF Webpage (www.cmsaf.eu/doi) with CHARMe plugin

Commentary Metadata

Commentary metadata enables both data providers (here CM SAF) and data consumers to share commentary information linked to the data, for example, how climate data have been used and what has been learned. This information can e.g. include:

- **Citations** that reference a particular dataset;
- **Results of assessments** – reanalysis, quantitative error assessments;
- **Provenance** – processing algorithms and chain data source;
- **External events** that may affect the data – volcanic eruptions, El Nino, sensor failure;
- Supplementary dataset **quality information** – maturity, discontinuity, updates.
- **Feedback** and comments on dataset usages

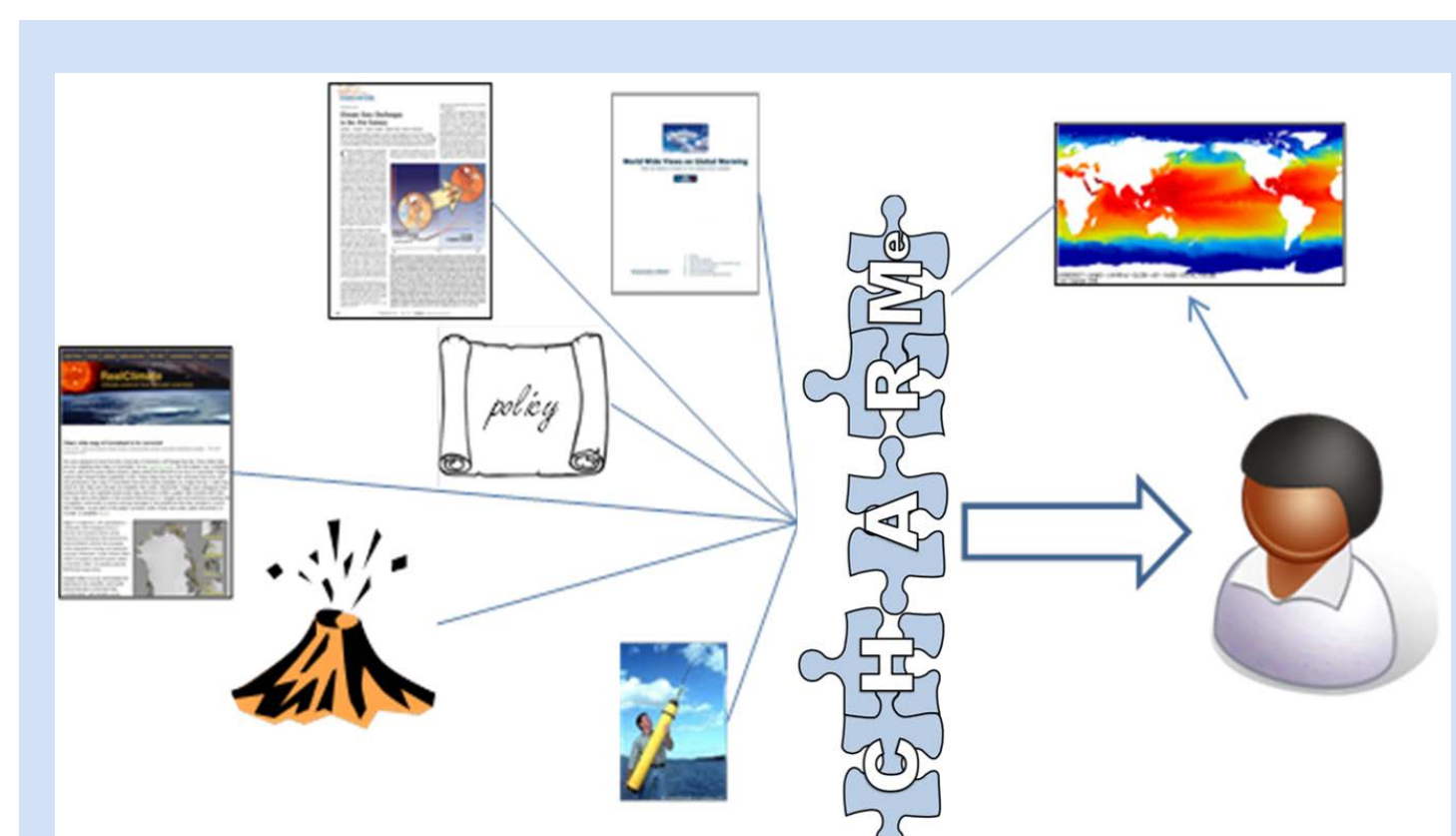


Figure 3: CHARMe provides users with supporting information

CHARMe Maps

CHARMe Maps is a tool which provides advanced functionality by linking an OGC WMS with the CHARMe node.

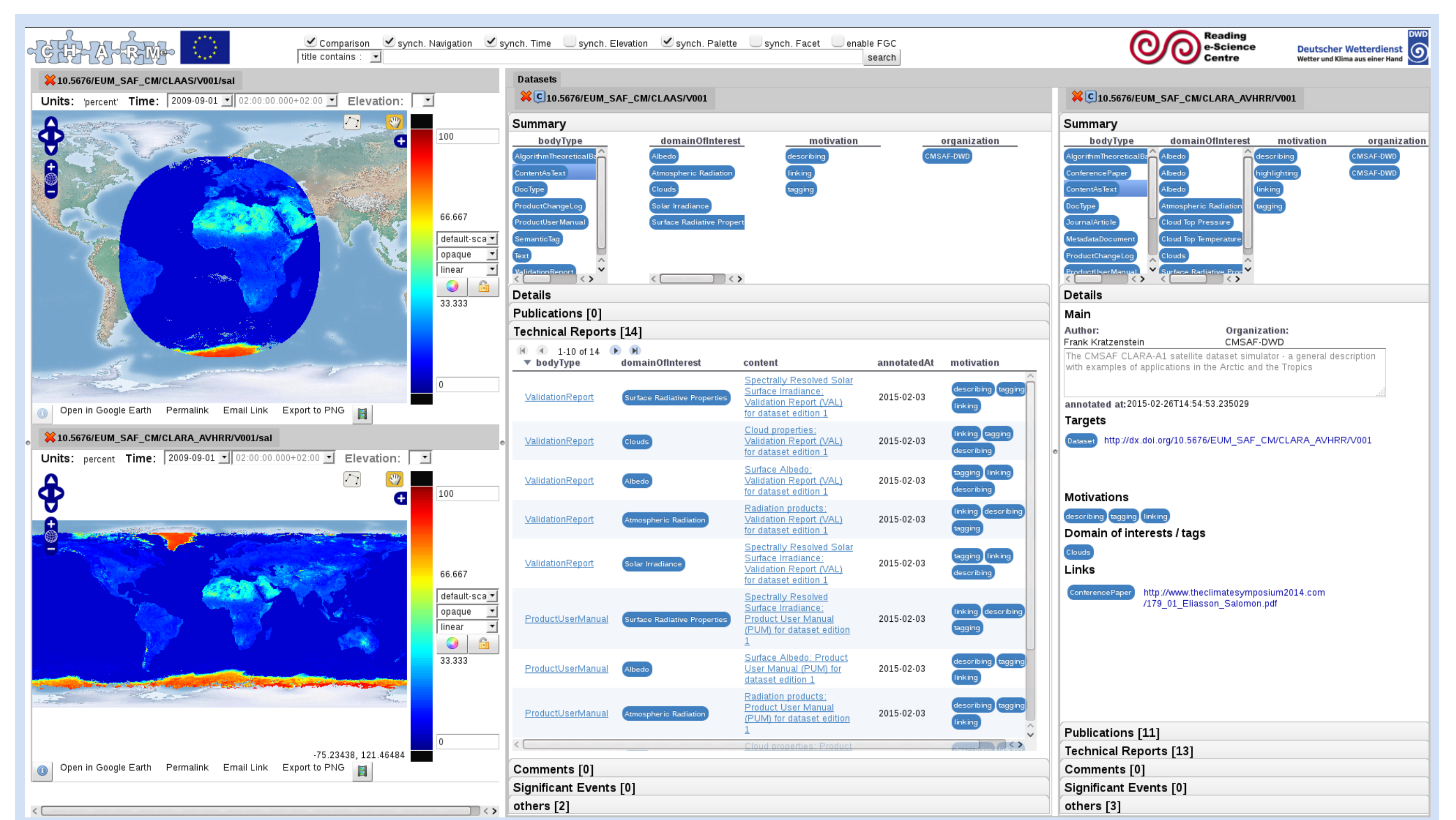


Figure 4: CHARMe Maps analysing two data records from CM SAF

Therefore CHARMe Maps is an OpenSource example of using the CHARMe Node and its OpenSearch API in order to gain more benefit from the commentary metadata. It enables users to compare or analyse datasets visually, having their commentary metadata directly at hand or one mouse click away.

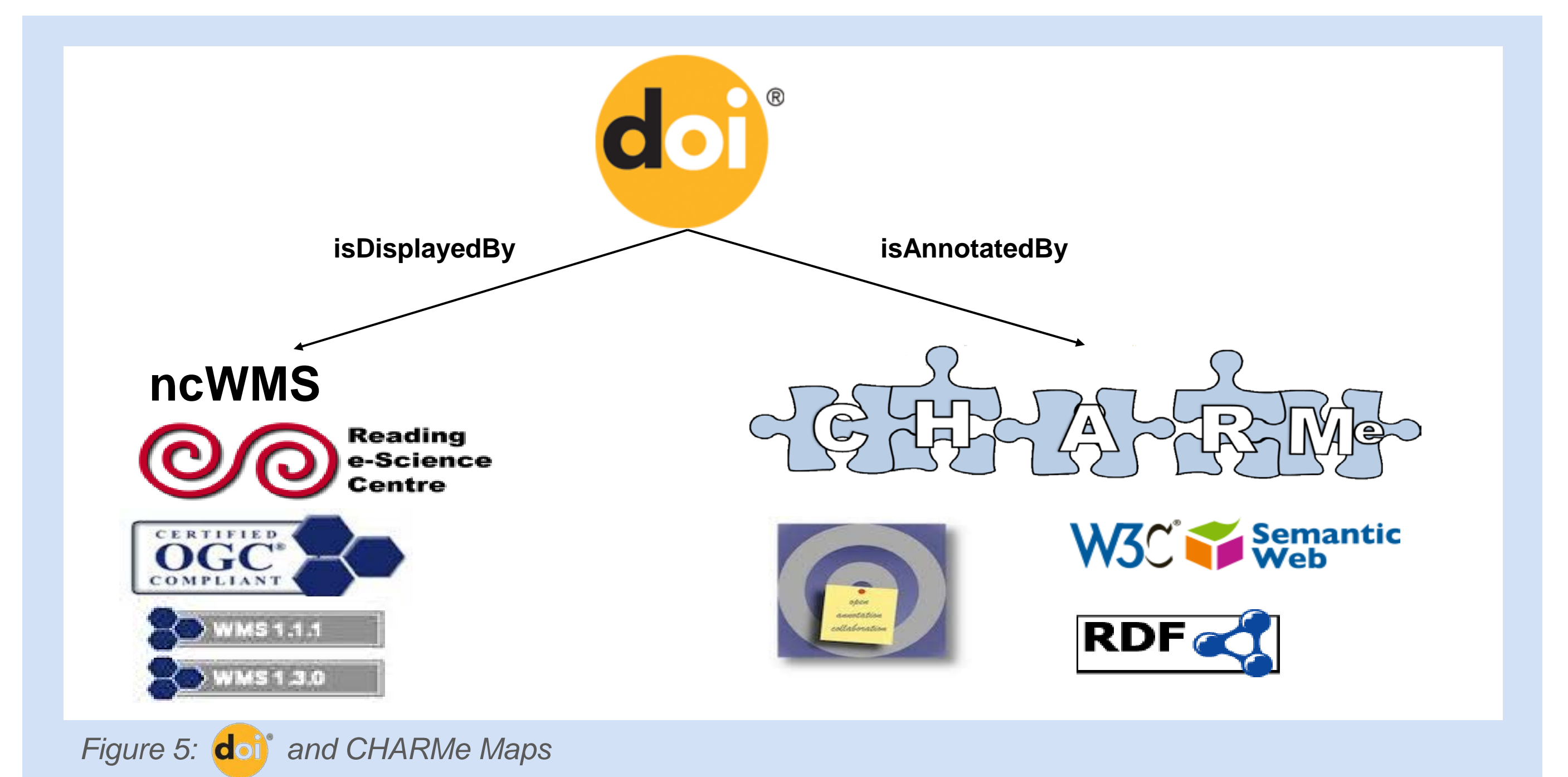


Figure 5: doi and CHARMe Maps

Furthermore, CHARMe Maps demonstrates how to exploit the usage of digital object identifiers, the doi. The doi is used to unambiguously identify the target side of an information. Inside CHARMe Maps, an OGC WMS provides a graphical representation of a doi and gives access to the data. The CHARMe node is connected by its OpenSearch API to deliver the background information, the annotations, of the doi.

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