MSFD Reporting in Belgium

An opportunity to strengthen data stewardship

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The **Marine Strategic Framework Directive** strives for Good Environmental Status of marine waters by 2020 and requires Member States to report criteria for eleven descriptors. The criteria cover **biodiversity**, **habitats**, **population health**, **eutrophication**, **seafloor morphology**, **hydrology**, **contaminants** in the environment and in seafood, **marine litter** (macrolitter) and the introduction of energy (**noise**).

The Directive stipulates that the data is reported according to the INSPIRE directive. The Technical Group on Marine Data (**TG DATA**) has issued a number of recommendations on how to reach INSPIRE compliance. Key steps are the creation of **metadata** using the **ISO 19115** standard, creating a **download service for the data**, even if they are not explicitly spatial, and lastly, to **transform the data towards the INSPIRE data specifications** if applicable.
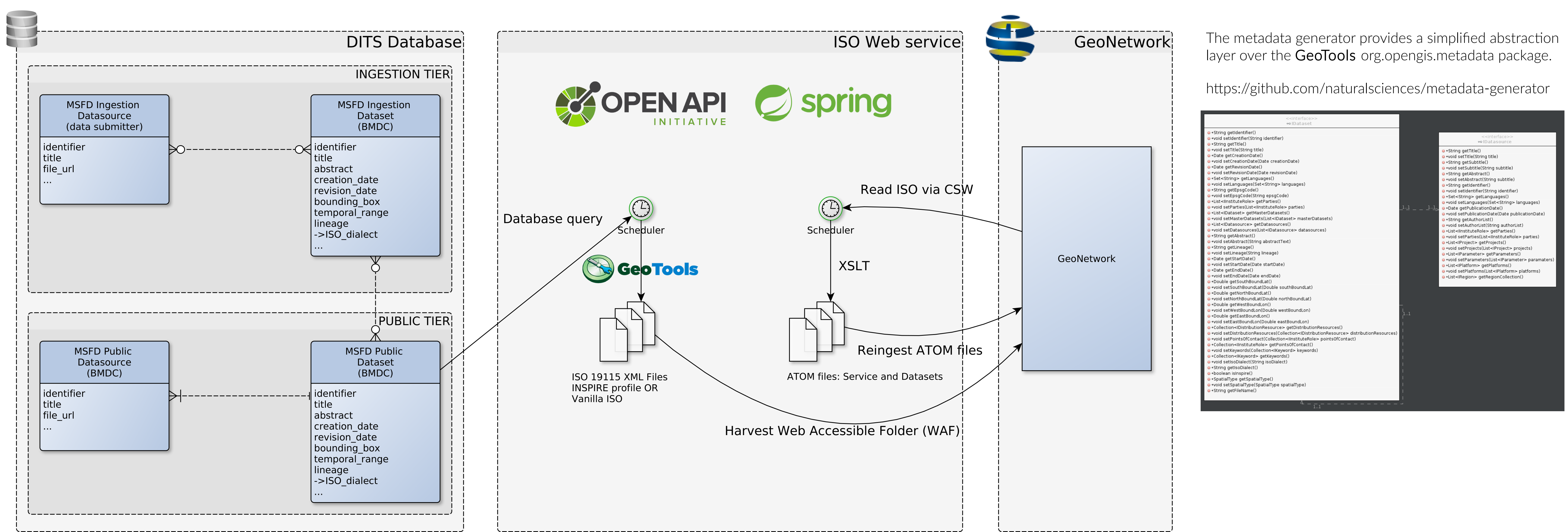
In Belgium, the **Scientific Service Management Unit of the Mathematical Model of the North Sea** (MUMM) is responsible for the organisation of the monitoring and the reporting of the report and data. The **Belgian Marine Data Centre** (BMDC) is responsible for data collection, data management and quality assurance, metadata creation, data transformation and publishing. Cleaned data and metadata are reported to the European Commission and the European Environmental Agency.

By applying the principle of configuration by convention, data and dataset identifiers can be reused across different systems with minimal configuration.

Metadata Management

The full set of MSFD Descriptor Criteria that is reported by Belgium covers 45 datasets. For efficiency reasons, this **metadata is generated automatically**. In order to maximize the traceability and lineage of datasets, the system is overlaid on an existing data auditing and tracking system, DITS (Adam *et al.*, 2016).

Data providers define and upload ingestion datasources in DITS (Excel files, Shapefiles, netCDF). These are associated with public datasets which correspond to a Descriptor Criterion and contain a reference to the report chapters. These are exposed as ISO metadata following the INSPIRE Profile and are then harvested by a metadata catalog (in our case GeoNetwork).

The metadata generator provides a simplified abstraction layer over the GeoTools org.opengis.metadata package.

https://github.com/naturalsciences/metadata-generator

Data Management and Transformations

Based on the TG Data recommendations, the BMDC has classified its MSFD datasets into the INSPIRE themes **Habitats and Biotopes** (HB), **Oceanographic Geographical Features** (OF) and **Sea Regions** (SR). Each has its own XSD output schema. OF and SR are essentially minimal wrappers around the **Observations and Measurements** schema.

For all data transformations, the Humboldt Alignment Editor (**HALE**) has been used. We are happy with the results, as it is a flexible tool that enables a certain measure of automation.

However, the end result is still static gml files, which is an appropriate solution for some datasets. But as all our wider oceanographic data falls into the OF theme, and INSPIRE applies to them, during a follow-up project we will investigate the use of a **Sensor Observation Service** to share our data, even though no sensors or continuous data streams are involved. Furthermore, although the netCDF files necessary for MSFD are currently made available via an INSPIRE ATOM Download service, a more robust solution is sought by using an **ERDDAP data server**.
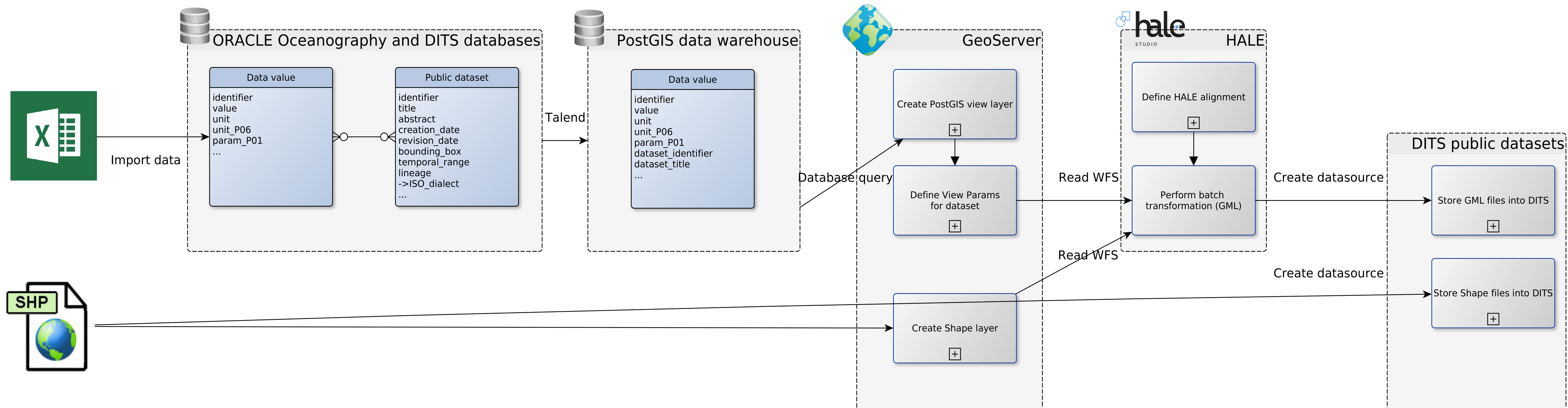
Adam M., Lagring R., Stojanov Y., Strobbe F., Vandenberghe T. (2016) Dealing with (historical) data and making it accessible: Data Inventory and Tracking System (DITS) applied in the scope of the "4 decades of Belgian marine monitoring" project (4DEMON). In: Bollettino di Geofisica Teorica ed Applicata: an International Journal of Earth Sciences, 57(Suppl.): pp. 201-202

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