Semantic interoperability in marine litter of EMODnet Chemistry

Elena Partescano[1], Matteo Vinci[1], Maria Eugenia Molina Jack[1], Alexia Cociancich[1]

[1] Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS

Standards and semantics are two fundamental elements for making data interoperable and reusable, particularly in the perspective of an Open Science that reflects the FAIR principles (Findability, Accessibility, Interoperability and Reusability).
An example of this is the EMODnet Chemistry infrastructure, which has been providing access to high-quality marine information that supports research and stakeholder objectives since 2009. The publication of data using standard protocols, formats and vocabularies makes data related to pollution (hazardous substances or marine litter) FAIR.
The Chemistry lot has been actively working on the management of marine litter data at EU level since 2016. This work is carried out according to the FAIR principles with the main goal of Descriptor 10 of the Marine Strategy Framework Directive.
In relation to marine litter, standard formats and common vocabulary services have been developed based on existing best practices and guidelines for marine litter, structuring detailed and qualified data management systems focusing on coastline and seafloor macrolitter and micro-litter.
To standardise data and metadata, common vocabularies were developed in collaboration with the British Oceanographic Data Centre, that put in place the NERC Vocabulary Server (NVS) in 2006. The use of standardised terms sets address the ambiguities associated with data marking and enables the machine to machine interactions. The definition of standard terminologies requires a big scientific effort to give a clear description while keeping the consistency between the terms in the same vocabulary.
Technically, the content of the relevant vocabularies was represented in an XML code list to facilitate the interoperability of common vocabularies with the ISO19139.

In general, an NVS URL looks like this:
http://vocab.nerc.ac.uk/collection/{listid}/{version}/
Concept: http://vocab.nerc.ac.uk/collection/{listid}/{version}/{termid}/

In the specific case of litter data, the "H" vocabularies are used to describe the litter types, shapes, size classes, color classes, material or polymer type and transparency classes, standardising the reporting of the properties that describe the microlitter particles.

An example of term is:
URI (http://vocab.nerc.ac.uk/collection/H01/current/H0100003)
Within Vocab: EMODnet micro-litter types
Alternative Labels: pellets

To summarise, the role of standards and semantics in EMODnet is to bring a step forward the work already done with official protocols and best practices at national, regional and EU level to compare and analyze the available data. This is a challenge and requires continuous work to maintain the alignment with scientific development.