EMODnet Chemistry and FAIR principles; evaluating and updating vocabularies

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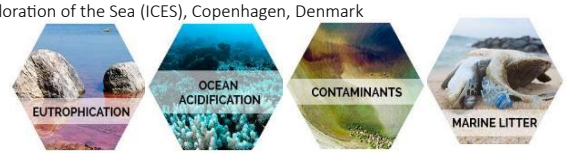
1. EMODnet Chemistry makes available standardised, harmonised, and quality-controlled data collections and derived data products on marine water quality (eutrophication–acidity, contaminants, and marine litter) for the European seas and aims to facilitate their findability, accessibility, interoperability and (re)usability (FAIR, www.go-fair.org/).



2. EMODnet Chemistry supports the Marine Strategy Framework Directive (MSFD 2008/56/EC) with respect to:

- Descriptor 5: Eutrophication
- Descriptor 8: Contaminants
- Descriptor 9: Contaminants in seafood
- Descriptor 10: Marine litter

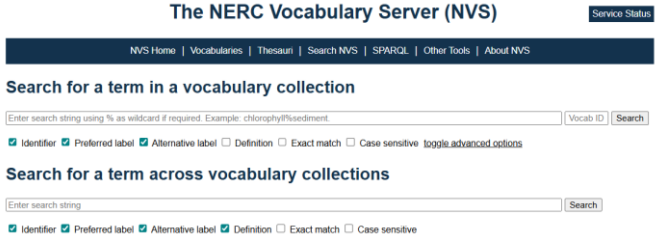
3. EMODnet Chemistry uses SeaDataNet's (SDN's) metadata formats and standards, including the Common Data Index (CDI, a metadata record for discovery and search).

EMODnet Chemistry and SDN use the Natural Environment Research Council (NERC) Vocabulary Server (NVS), managed by the British Oceanographic Data Centre (BODC), to standardise metadata and variable descriptions with controlled vocabularies and their URIs.

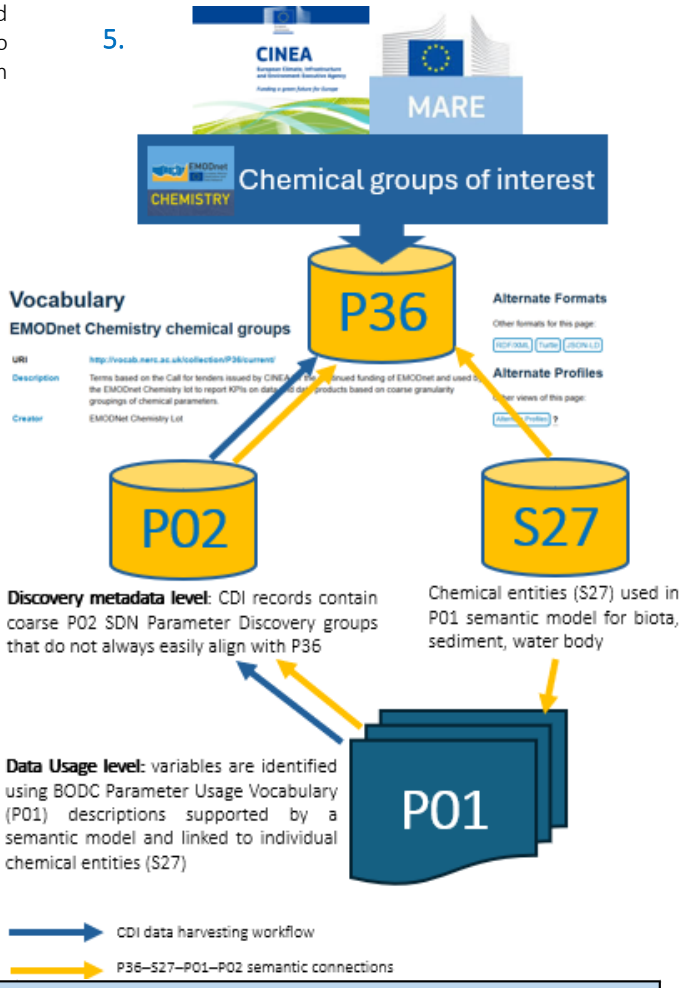
4. NVS

- Access to uniquely identified lists of terms (vocabularies) related to marine data.
- Standardised vocabularies are used for indexing, annotating, and searching for data, enabling greater **findability**, **interoperability** and **reuse**.
- Hierarchical mapping between vocabularies.

https://vocab.nerc.ac.uk/search_nvs/



5.



6. Revisions

Working group activities reviewed EMODnet Chemistry vocabulary issues and conflicts between the data workflow and the semantic alignments, and proposed improvements: some P36 names ("preferred labels") and definitions were updated for clarity, correctness, and better alignment with existing vocabularies including P02 and vocabularies of the International Council for the Exploration of the Sea (ICES), making more data **findable** and **interoperable**. Overall, these **efforts improve EU marine data management and support alignment with other EU frameworks**.

Identifier	Old name ("preferred label")	Old definition	Preferred label	Definition
PCBXX	*Polychlorinated biphenyls*	*Concentrations of synthetic organic compounds with one or more chlorine atoms attached to a double benzene ring. These are highly toxic persistent organic pollutants.*	*DEPRECATED*	*DEPRECATED*
ORGHAL	--	--	**Organohalogens**	Any of a class of organic compounds that contain at least one halogen (fluorine [F], chlorine [Cl], bromine [Br], or iodine [I]) bonded to carbon. Organohalogen substances that are predominately used as pesticides are excluded from this group.
HCARBS	Hydrocarbons	*Concentrations of organic compounds comprising carbon and hydrogen.*	Hydrocarbons	Concentrations of hydrocarbons. A hydrocarbon is an organic compound consisting entirely of hydrogen and carbon. Hydrocarbons include, for example, alkanes, alkenes, alkynes, and parent polycyclic aromatic hydrocarbons (PAHs). However, this group also includes transformed PAH products such as nitro-PAHs (N-PAHs), carbonyl-PAHs (C-PAHs) and hydroxyl-PAHs (HO-PAHs).
PESTBI	Pesticides and biocides	*Concentrations of synthetic organic compounds designed to kill plants (including algae) or insects deemed physically or economically harmful to man.*	**Pesticides**	Concentrations of pesticides (in use and banned in the EU), excluding those used mainly in antifouling paints (for boats and ships) and pharmaceuticals (e.g. certain fungicides). A pesticide prevents, destroys, or controls a harmful organism ('pest') or disease, or protects plants or plant products during production, storage, and transport. Pesticides include, for example, biocides (substances for non-food and non-feed purposes) and plant protection products (substances for food and feed purposes).
ANTIFL	Antifoulants	*Concentrations of synthetic organic compounds used in coatings of ships below the waterline or marine structures to prevent colonisation by marine organisms.*	**Organometals**	Concentrations of organometallic substances, including those within antifouling paints and products (in use or previously used); for example, EU banned organotin compounds (e.g. tributyltin).
RADNUC	Radionuclides	*Activities of dissolved and particulate radioactive substances of anthropogenic origin.*	Radionuclides	Activities of radionuclides and related parameters. Radionuclides occur naturally or are artificially produced (e.g. in nuclear reactors or radionuclide generators). A radionuclide is a nuclide that has excess numbers of either neutrons or protons, giving it excess nuclear energy, and making it unstable. Therefore, this group excludes stable nuclides such as carbon-13 and nitrogen-14.
HVYMTL	Heavy metals	*Concentrations of metals or metalloids that cause environmental concern.*	**Metals and metalloids**	Concentrations of metals and metalloids, some of which are of environmental concern. This category also includes selenium (Se), a reactive non-metal, but excludes silicon (Si, a metalloid) as this is mapped to the P36 SLCATE.
PHARMS	Pharmaceuticals	*Concentrations of compounds manufactured as medicinal drugs.*	Pharmaceuticals	Concentrations of pharmaceuticals in the marine environment. These are primarily used in the diagnosis, treatment, or prevention of disease and for restoring, correcting, or modifying organic functions, including human and veterinary drugs (e.g. antibiotics, anti-inflammatory drugs, steroid hormones, anti-microbial drugs, and illegal drugs).
OTCHEM	--	--	**Other chemical parameters**	Concentrations of chemical parameters not included in the other P36 groups; for instance, organo-oxygen substances (e.g. alcohols, phenols (non-chlorinated), ketones, and esters), stable isotopes, and biotoxins.
FERTIL	Fertilisers	*Concentrations of biologically available substances derived from the use of artificial fertilisers in agriculture (primarily nitrogen and phosphorus).*	**N+P nutrients**	Concentrations of organic and inorganic nitrogen and phosphorus nutrients; for example, nitrate, nitrite, ammonium, and phosphate.
SLCATE	Silicates	*Concentrations of dissolved inorganic silicon usually as hydrosilicic acid (often called silicate) and biogenic silica.*	Silicates	Concentrations of dissolved inorganic silicon usually as hydrosilicic acid (often called silicate) and biogenic silica.
NUTLOAD	Nutrient loads	*Load of nitrogen and phosphorus to regional seas by major rivers.*	Nutrient loads	Load of nitrogen and phosphorus to regional seas by major rivers.
ORGMAT	Organic matter	*Concentrations of chemical species (primarily forms of carbon and nitrogen) resulting from sewage outfalls and aquaculture.*	Organic matter	Measurements relating to organic matter, which refers to the large source of carbon-based compounds found within terrestrial and aquatic environments and is composed of organic compounds derived from the remains and byproducts of organisms such as plants and animals. Aquatic organic matter can be divided into dissolved organic matter (measured as coloured dissolved organic matter or dissolved organic carbon) and particulate organic matter.
CHPHYL	Chlorophyll	*Measurements of the phytoplankton biomass proxy pigment, usually accompanied by its degradation products (phaeopigments).*	Chlorophyll	Measurements of chlorophyll (a green pigment present in all green plants and in cyanobacteria that is responsible for the absorption of light to provide energy for photosynthesis) and its degradation products (phaeopigments). Chlorophyll-a is an indicator of phytoplankton biomass and reflects the level of primary production in marine waters.
ACIDIT	Acidity	*The parameters that quantify the carbonate system in seawater (pH, alkalinity, TCO2 and pCO2).*	Acidity	The parameters that quantify the carbonate system in seawater; for example, pH, alkalinity, dissolved inorganic carbon, and carbon dioxide (e.g. pCO2).
DISGAS	Dissolved gases	*Concentrations of dissolved gases with oxygen and carbon dioxide of primary interest.*	Dissolved gases	Concentrations of dissolved gases in water, for example, dissolved oxygen. This group excludes carbon dioxide (since April 2025), which is with carbonate system parameters (ACIDIT), and hydrocarbons in a gas state (e.g. methane), which are groups under hydrocarbons (HCARBS).
PLASTIC	*Plastics*	*The quantity of litter and debris made up of polymerised organic compounds.*	*DEPRECATED*	*DEPRECATED*
MRNLTTR	Marine litter	*Measurements of any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment. These are quantified by collection on beaches, in fishermen's nets, or in specific surveys and include macro objects (nets, bottles etc.) as well as fragments and micro particles in water column, sediment and beaches.*	**Marine litter, including Plastics**	Measurements of litter, including plastics, in the coastal and marine environments (i.e. beach, seabed, sediment, water column). Litter is defined as any persistent, manufactured, or processed solid material that is discarded, disposed of, or abandoned, and can be categorised by size as macro- (> 25 mm), meso- (5-25 mm) and micro-litter (< 5 mm).

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