



Water
Health
Open
Knowledge



Co-financed by the Connecting Europe Facility of the European Union

Pattern-based design for modelling an ontology network in the water and health domains

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Global issues require open data models

The UN Sustainable Development Goals



<https://sdgs.un.org/goals>

Project and objective

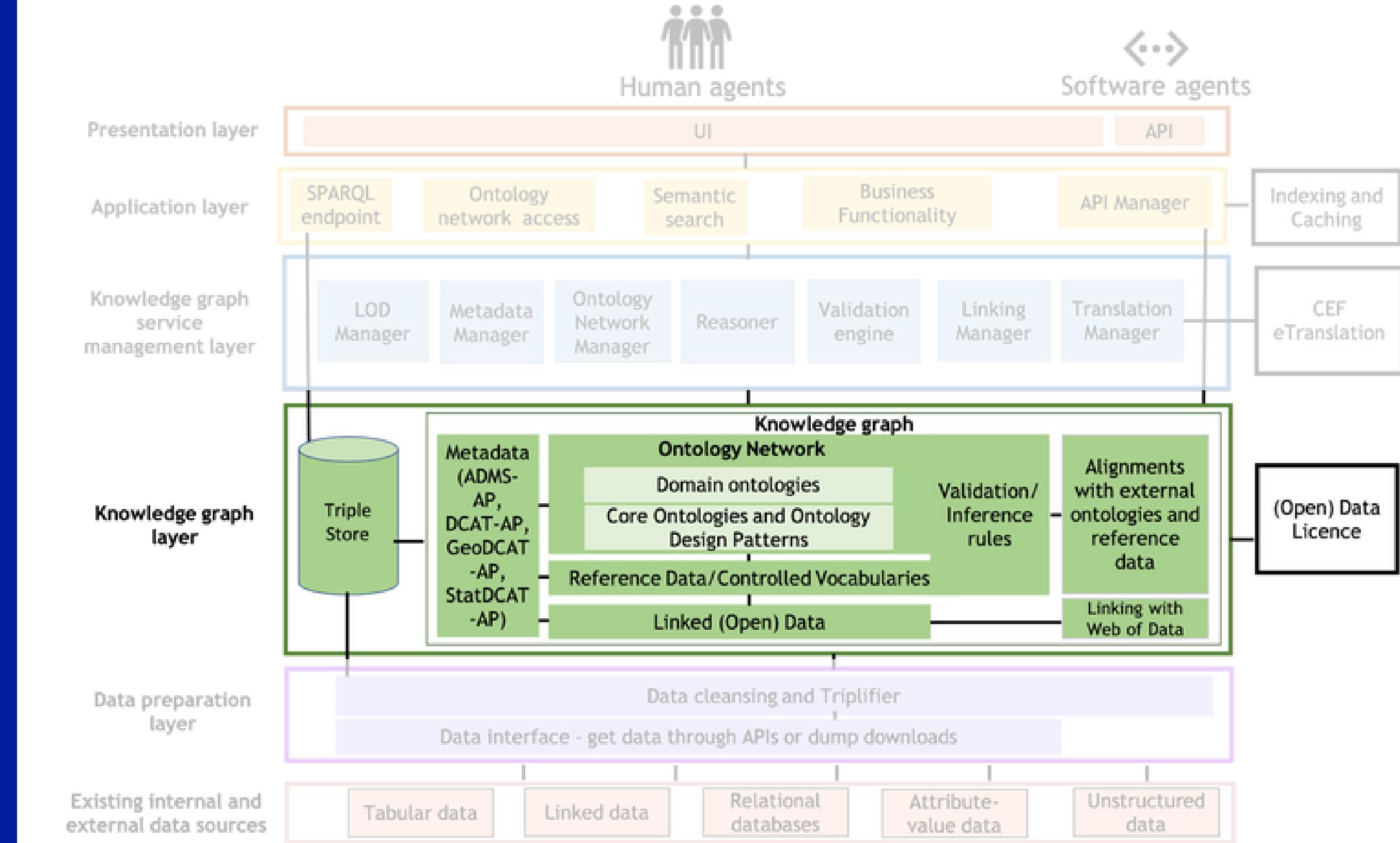
Create the first European open distributed knowledge graph aimed at linking, using a common semantics, data on water consumption and quality with health parameters.

WATER AND HEALTH DATA CHALLENGES

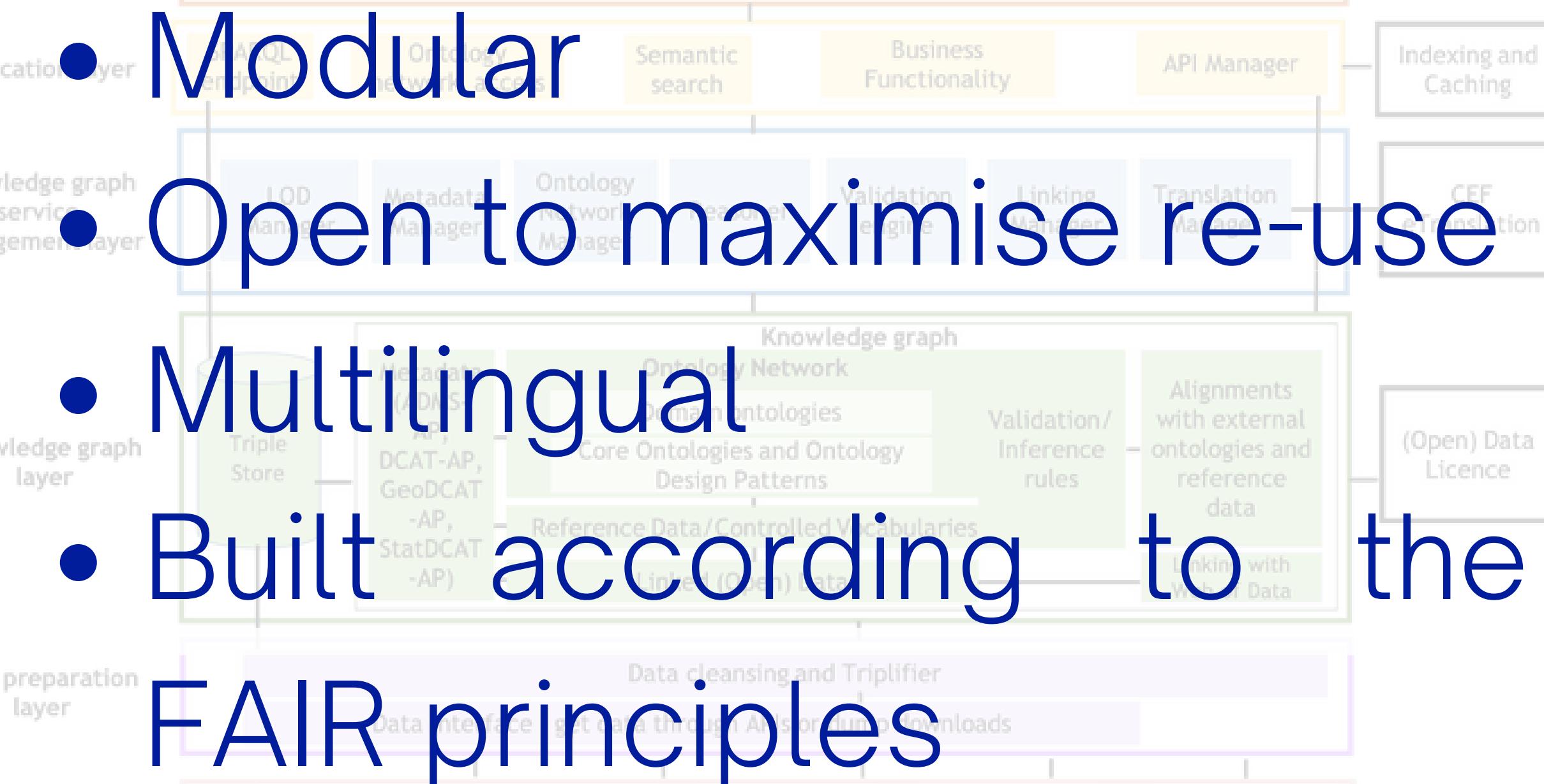


- Missing data
- Closed data
- Heterogeneous data
- Knowledge FAIRification

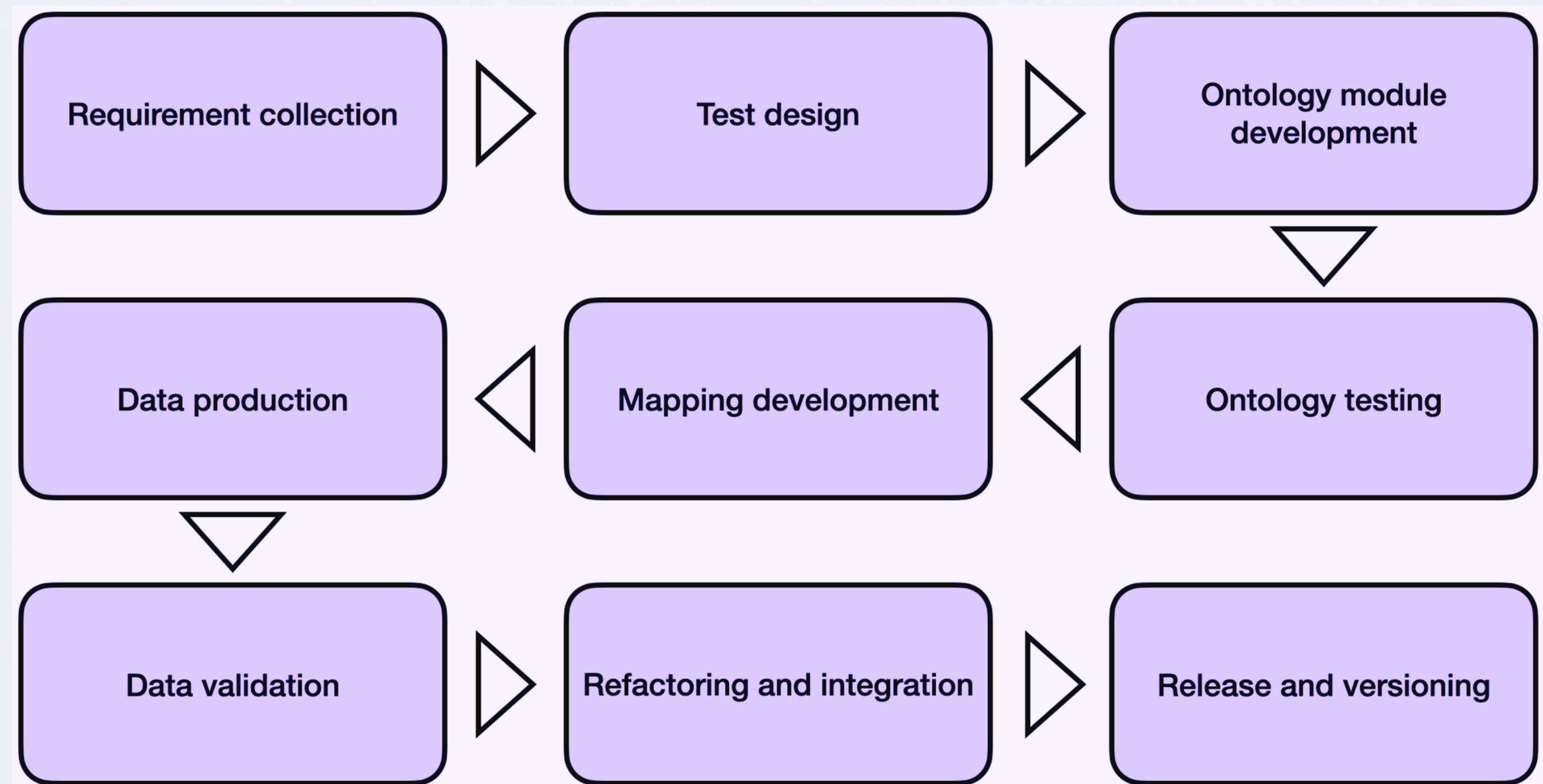
Ontology network



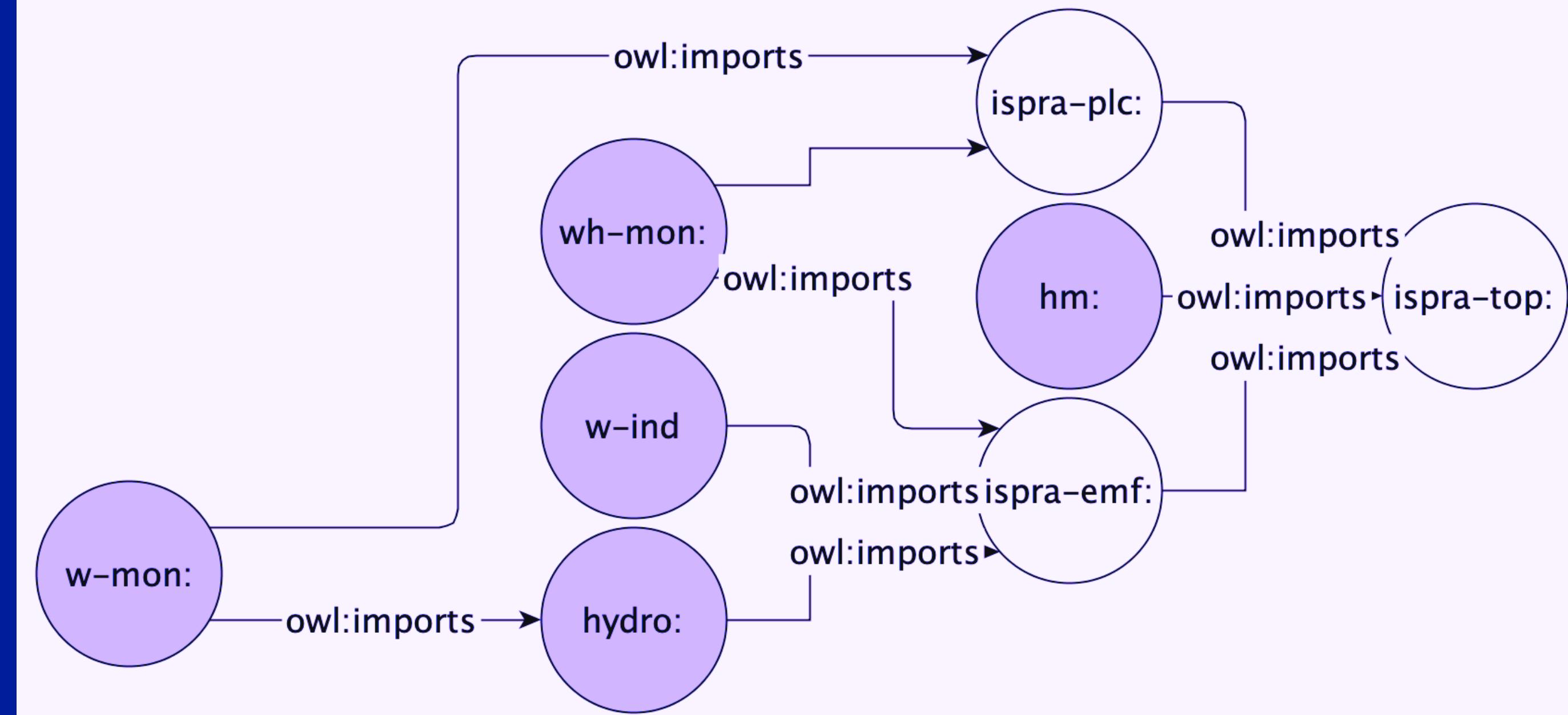
Ontology network

- Modular
 - Open to maximise re-use
 - Multilingual
 - Built according to the FAIR principles
- 
- The diagram illustrates the architecture of the Ontology Network across five layers:
- Presentation layer:** UI, API.
 - Application layer:** Semantic search, Business Functionality, API Manager.
 - Knowledge graph service management layer:** LOD Manager, Metadata Manager, Ontology Network Manager, Resource Identifier Manager, Validation Engine, Linking Manager, Translation Manager.
 - Knowledge graph layer:** Triple Store, Metadata (ADM, AP, DCAT-AP, GeoDCAT-AP, StatDCAT-AP), Ontology Network, Core Ontologies and Ontology Design Patterns, Reference Data/Controlled Vocabularies, Linked (Open) Data, Validation/Inference rules, Alignments with external ontologies and reference data, Linking with Web Data, (Open) Data Licence.
 - Data preparation layer:** Existing internal and external data sources (Tabular data, Linked data, Relational databases, Attribute-value data, Unstructured data), Data cleansing and Triplifier (Data interface, get data through APIs or download, Downloads).
- Human agents and Software agents interact with the API and UI respectively.

Method: eXtreme Design

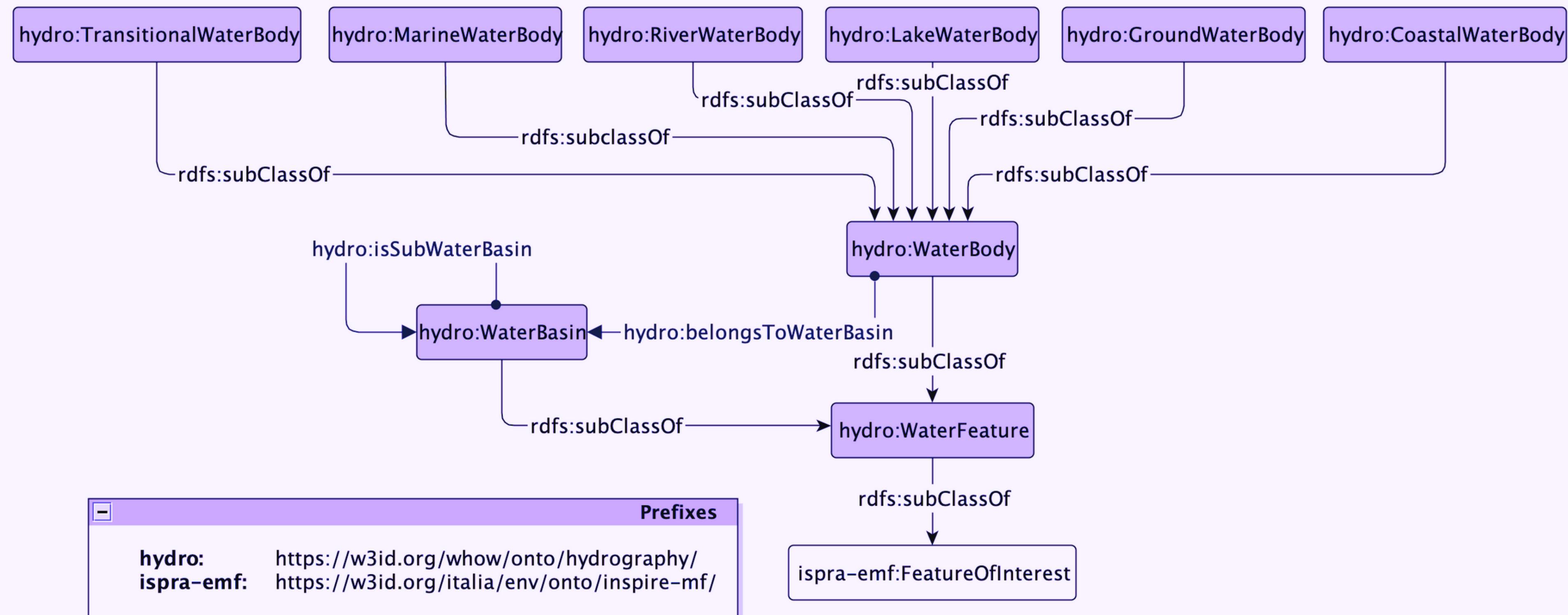


Ontology network

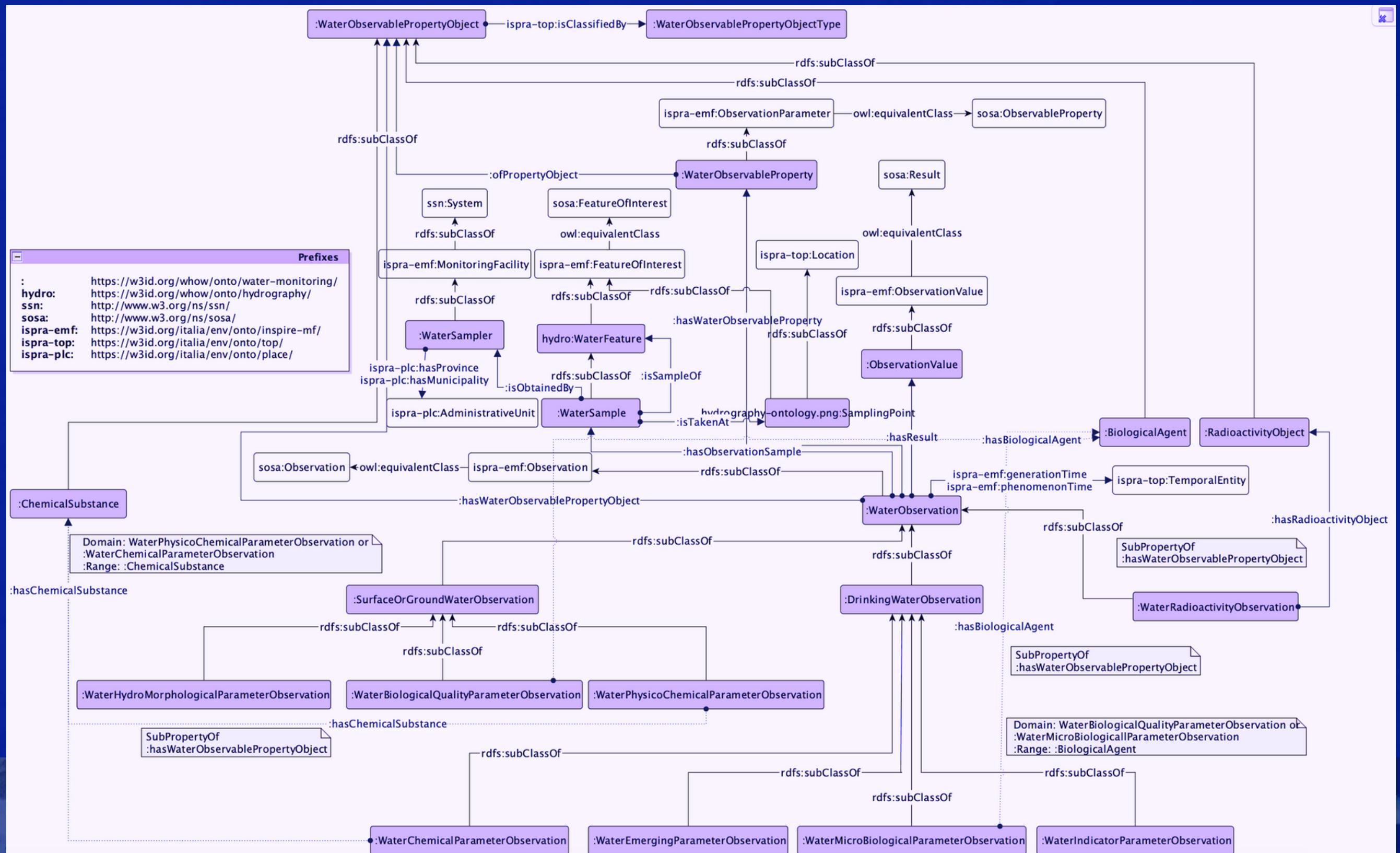


Prefixes	
ispra-top:	https://w3id.org/italia/env/onto/top/
ispra-emf:	https://w3id.org/italia/env/onto/inspire-mf/
ispra-plc	https://w3id.org/italia/env/onto/place/
hm:	https://w3id.org/whow/onto/health-monitoring/
hydro:	https://w3id.org/whow/onto/hydrography/
w-ind:	https://w3id.org/whow/onto/water-indicator/
w-mon:	https://w3id.org/whow/onto/water-monitoring/
wh-mon:	https://w3id.org/whow/onto/weather-monitoring/

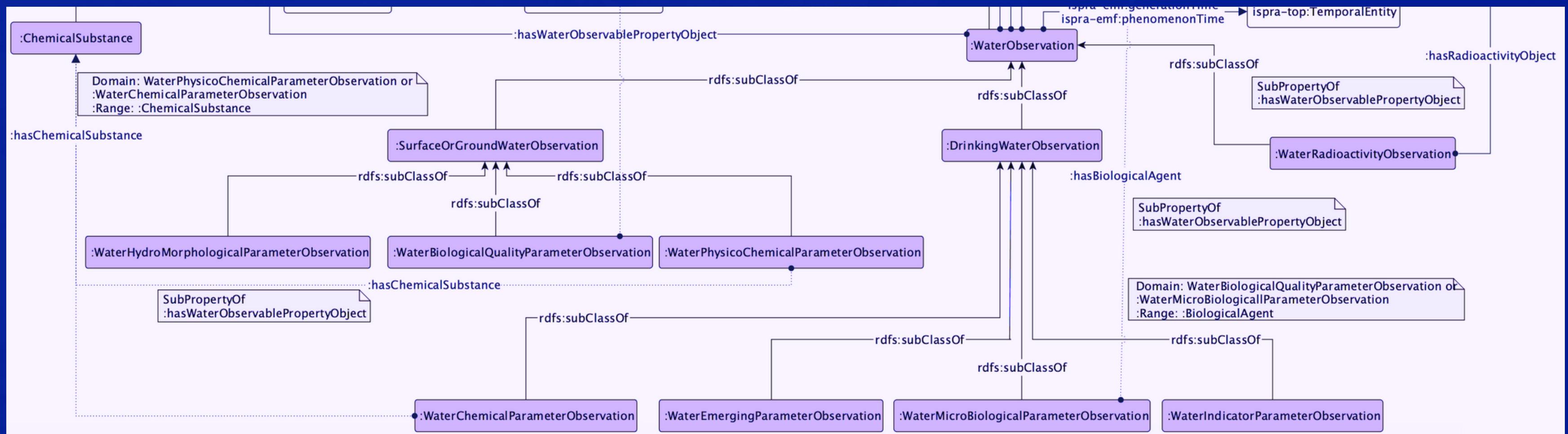
Hydrography ontology



Water Monitoring ontology

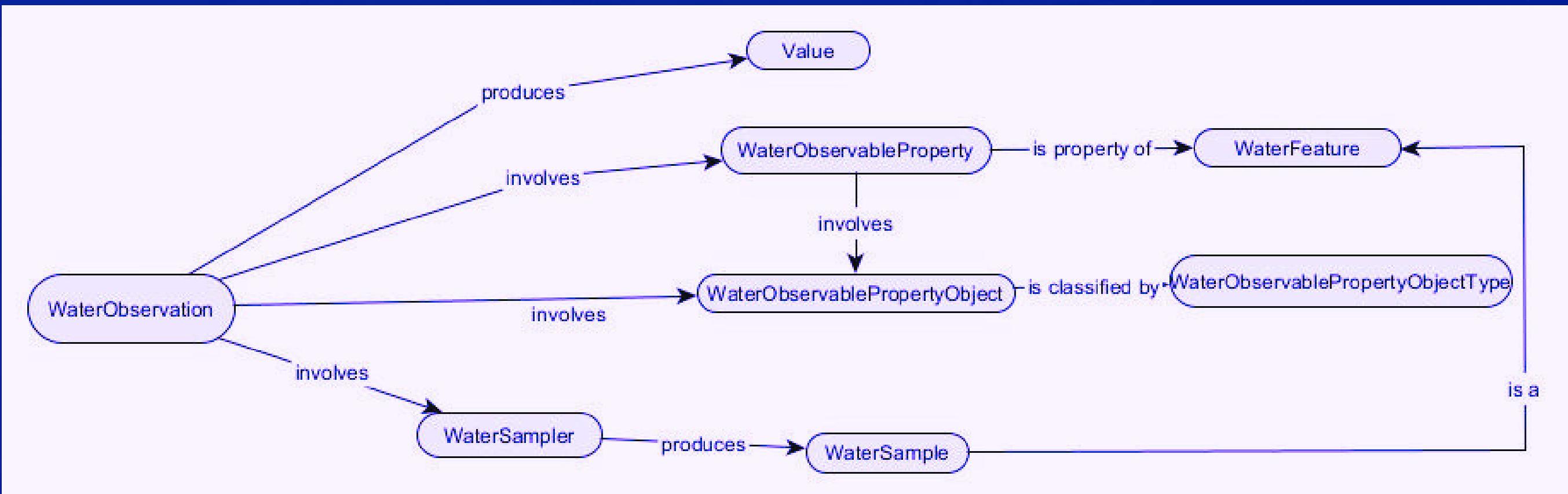


Water Monitoring ontology



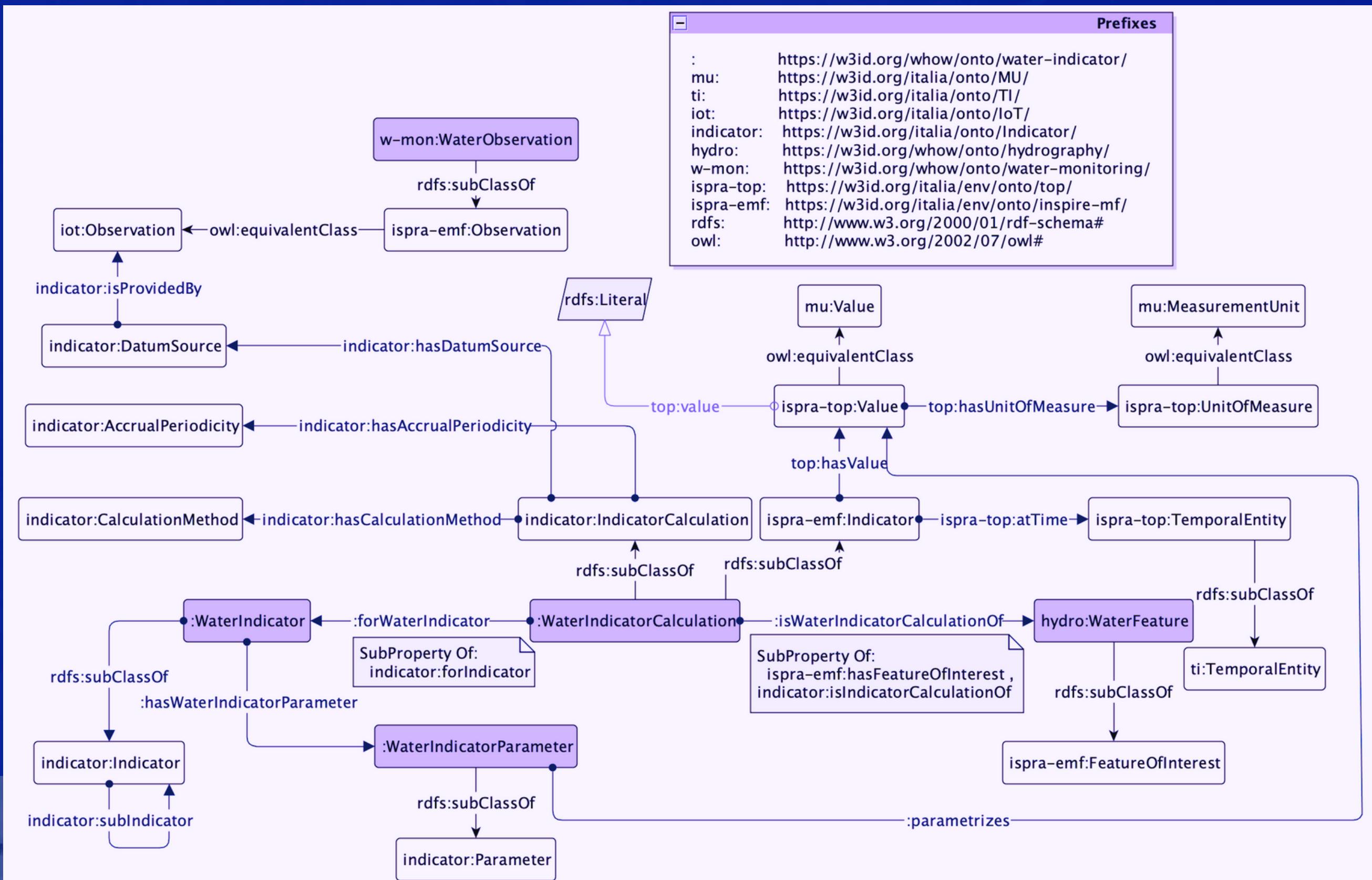
Water observations

Water Monitoring ontology

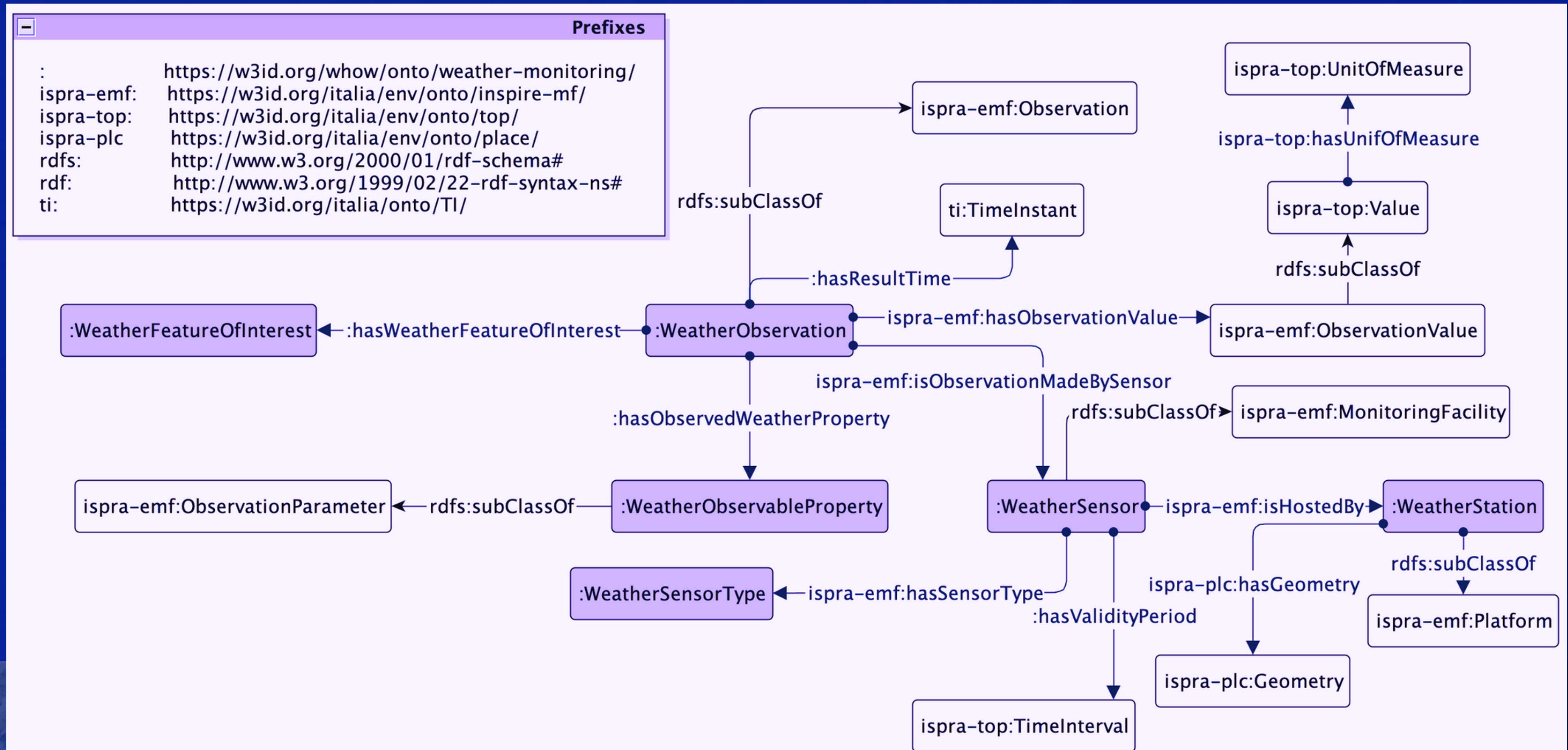


Conceptualization of observable properties and related objects

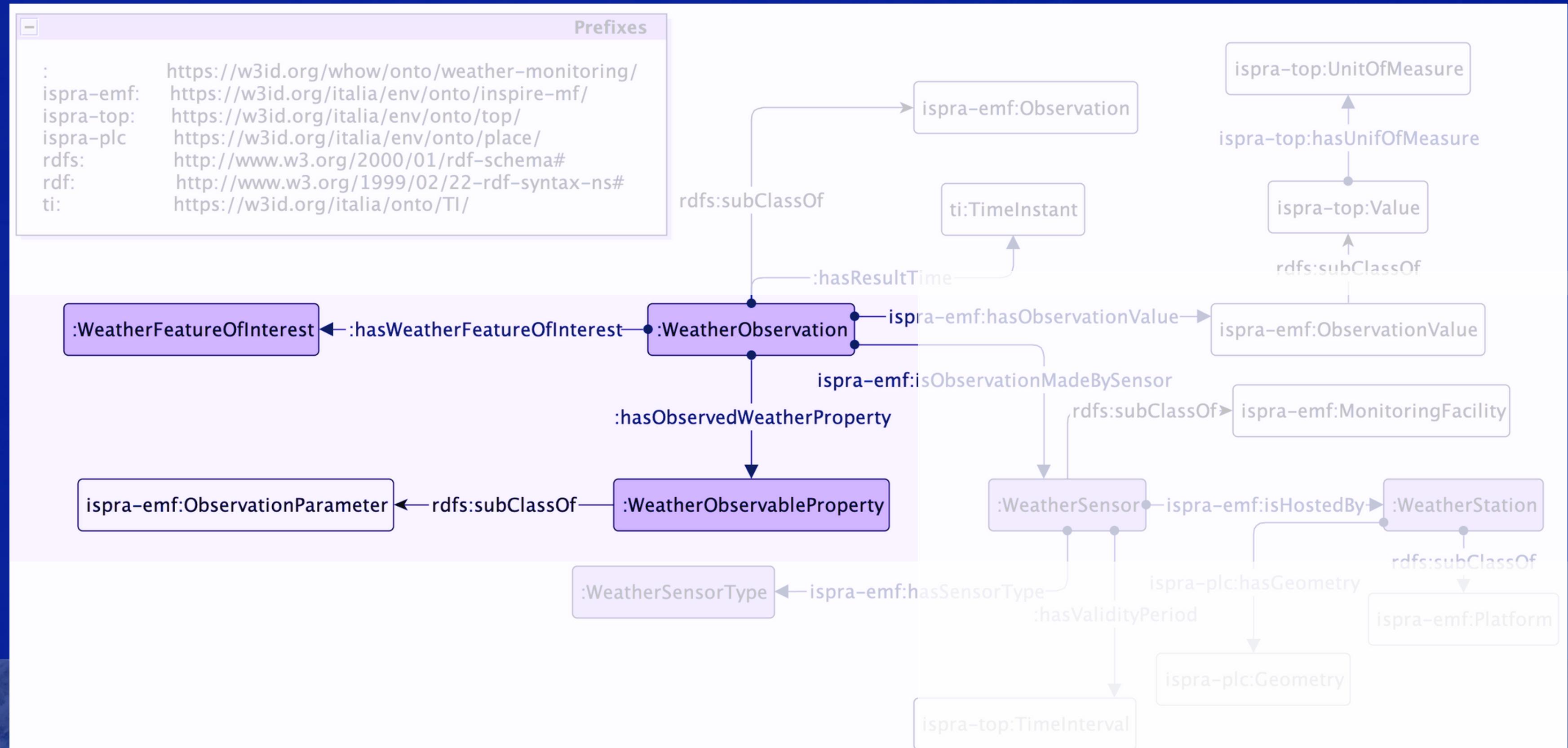
Water Indicator ontology



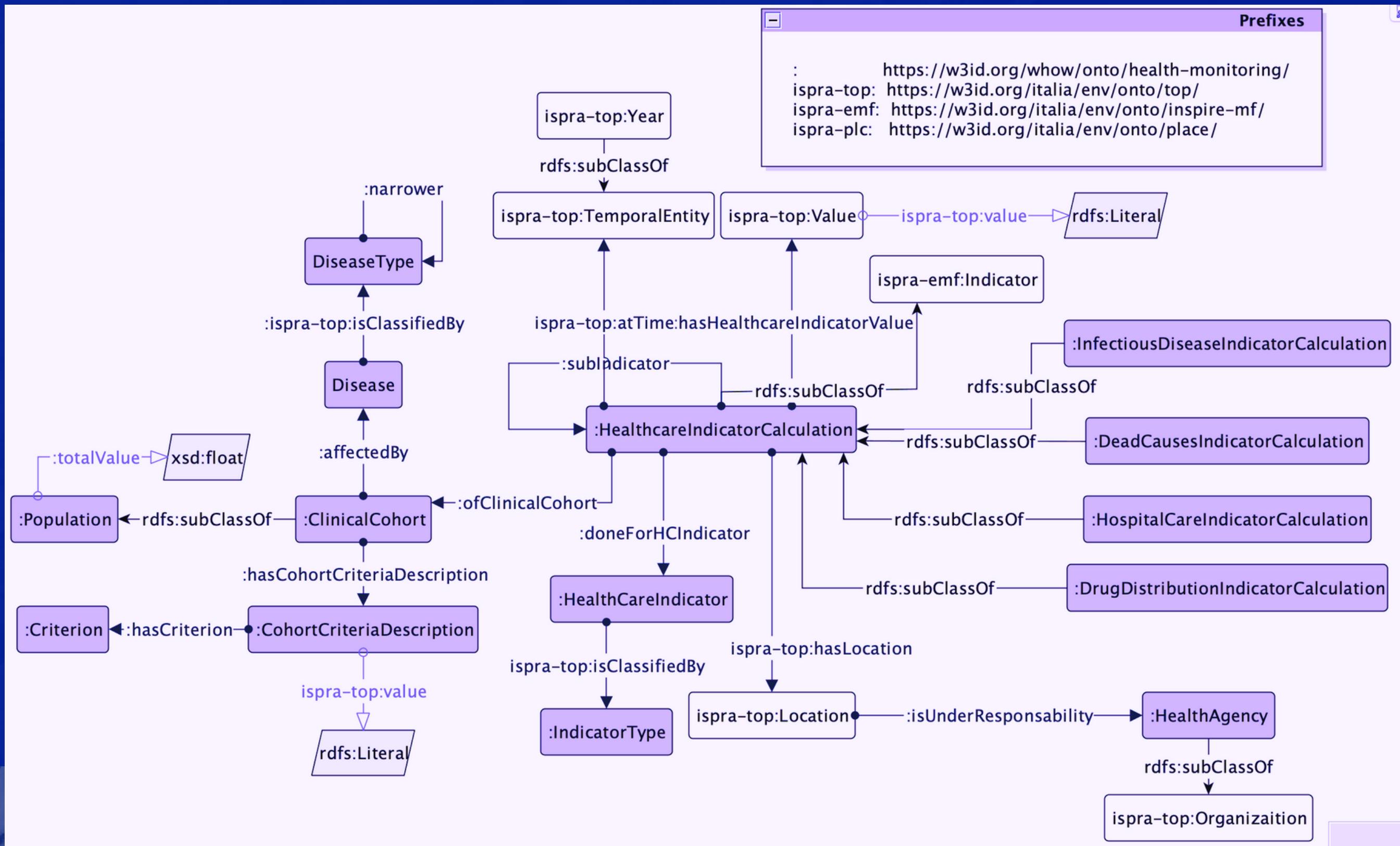
Weather Monitoring ontology



Weather Monitoring ontology



Health Monitoring ontology





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TECHNICAL REPORTS



ONTOLOGY NETWORK



GITHUB REPOSITORY

