

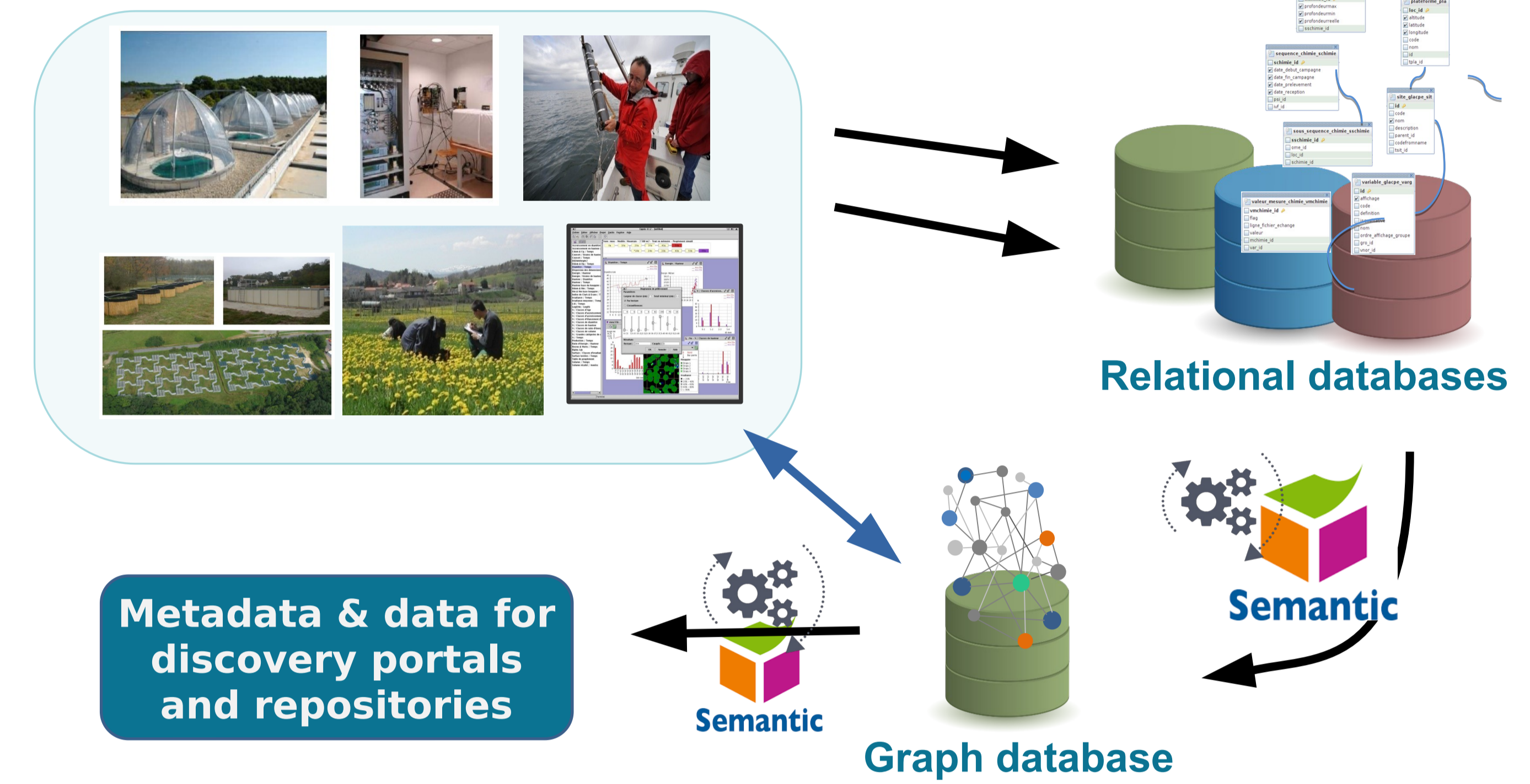
## Context and objective

The AnaEE-France (Analysis and Experimentation on Ecosystems) Research Infrastructure offers experimental facilities for studying ecosystems and biodiversity. The data generated by the AnaEE platforms are most often managed in relational database.

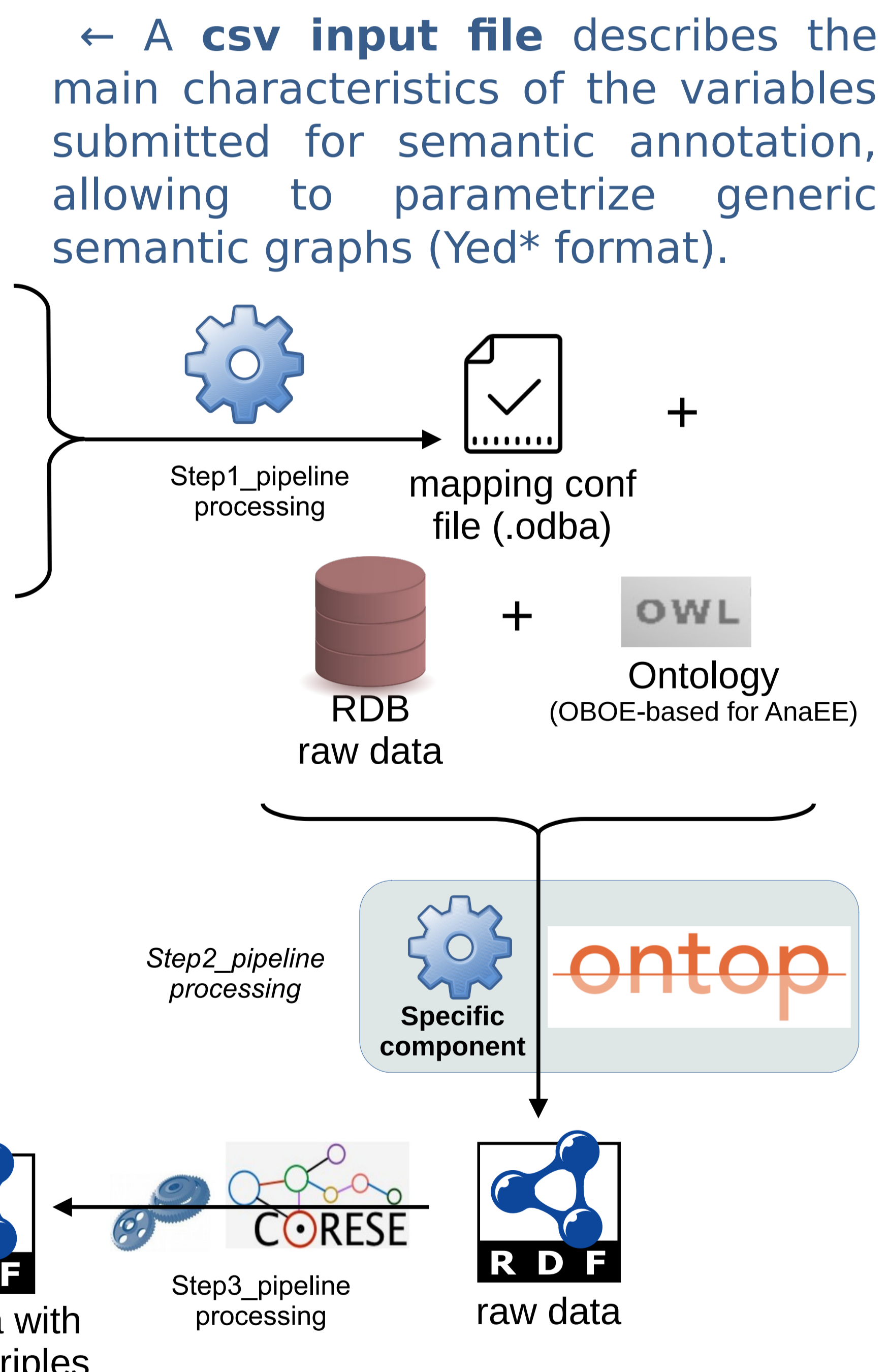
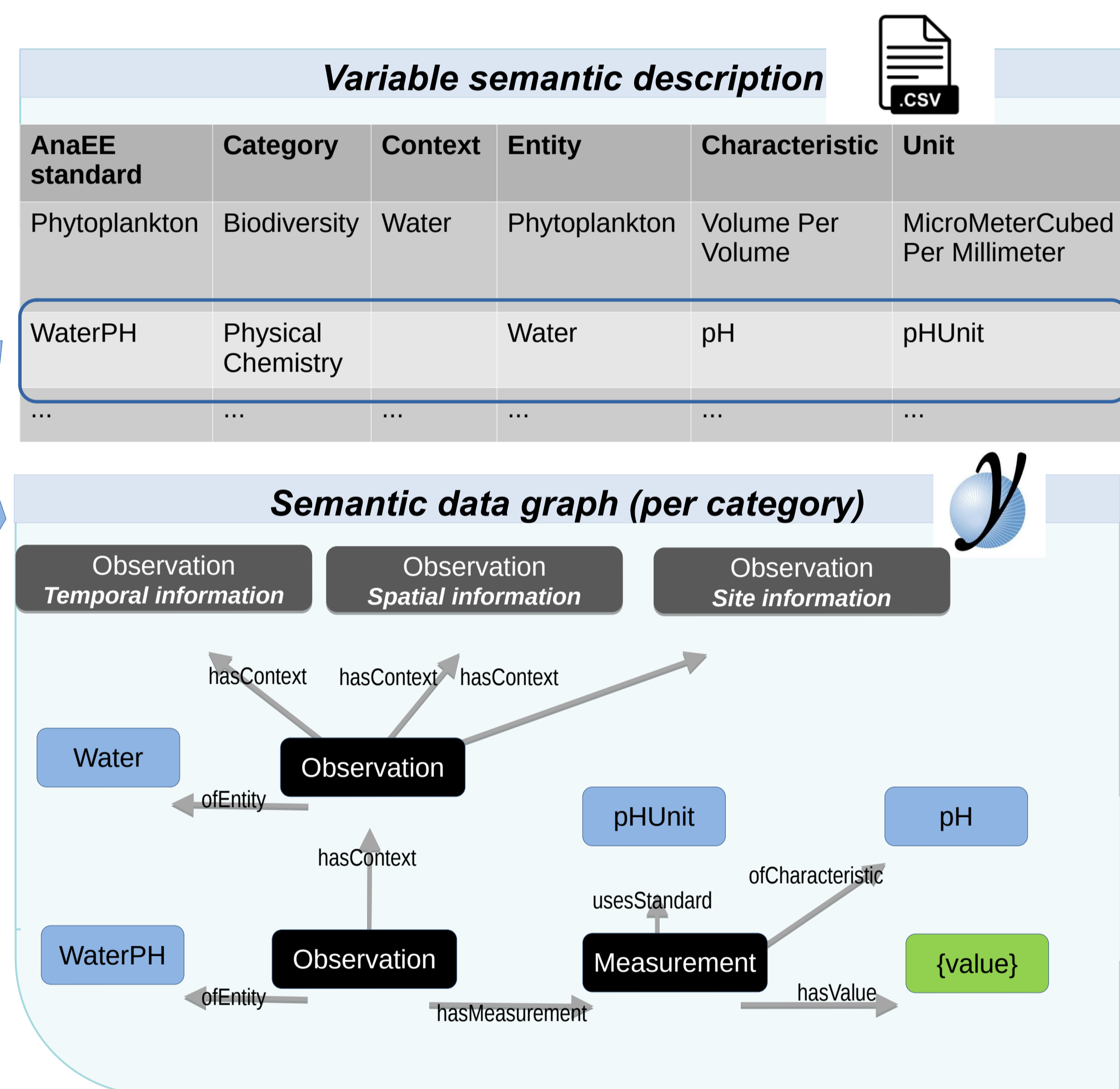
A distributed Information System (IS) is developed, based on semantic interoperability of its components and using common vocabularies (AnaeeThes thesaurus and OBOE-based ontology). Discovery and access portals are fed by information (rdf triples) produced by the semantic annotation of the resources that also generate metadata and datasets.

Two pipelines are developed for facilitating the semantic annotation and exploitation processes which may represent a huge conceptual and practical work.

### Experimental, analytical and modelling platforms



## Semantic data generation from a pipeline for database annotation



The **annotation pipeline** can be used in different contexts of ontologies and databases.

It includes shell scripts and specific java developments and requires the Yed, Ontop, Corese and Blazegraph softwares. It is deployed as a classical scripted application or as a dockerised one.

- The annotation pipeline consists in 4 steps:
1. generation of the mapping files to be used by Ontop\*\* (database connexion parameters, sets of sql queries and of the corresponding triples)
  2. production of the initial triples (ttl files) by a specific program and Ontop tool.
  3. production of inferred triples by Corese\*\*\* from the ontology rules
  4. uploading of the ttl files within the Blazegraph\*\*\*\* software and initialisation of the end point

Current developments will allow data annotation from several relational database software (PostgreSQL, MySQL, ...) and csv flat files.

\*<https://www.yworks.com/products/yed>  
 \*\*Diego Calvanese, Benjamin Cogrel, Sarah Komla-Ebri, Roman Kontchakov, Davide Lanti, Martin Rezk, Mariano Rodriguez-Muro, and Guohui Xiao. Ontop: Answering SPARQL Queries over Relational Databases. In: Semantic Web Journal 8.3 (2017), pp. 471-487.  
 \*\*\*<http://wimmics.inria.fr/corese>  
 \*\*\*\*[https://wiki.blazegraph.com/wiki/index.php/Main\\_Page](https://wiki.blazegraph.com/wiki/index.php/Main_Page)

## Semantic data exploitation by a pipeline for metadata and datasets generation

Outputs of the annotation pipeline are used by an **exploitation pipeline** for:

1. generation (through a SPARQL query on raw data) of synthetic data that feeds the discovery portal,
2. generation of standardised GeoDCAT and ISO19115/19139 metadata records,
3. generation of data file (NetCDF as first format) from selected perimeters (e.g years, experimental sites, variable categories...). In that case, the annotation pipeline is launched using a dedicated webservice.

Metadata and data products are transferred to a Dataverse repository

