Objectives

- Develop a evolutionary semantic framework for data discovery
- Derive semantic functionality rules required for data computation discovery
- Adaptive learning rules and metrics for the sustainability of the Seas data discovery

Description of work

Task T1.1: Develop evolutionary semantic algorithms to investigate data extraction and transformation in ontologies (M1-M18) *Leader: **EBD-CSIC**. Contributors: 1*

Evolutionary driven ontologies will be mapped to a graph-based data architecture flexible enough to get high scalability (i.e. Neo4j) and to infer multilayer metrics (T1.2). Currently software tools for mapping and linking the terms between different ontologies are still to be developed [5] and/or avoid adaptive algorithms for doing data extraction and transformation (refs ++, add as ref Semantic Web technologies are included in programs such as the U.S. National Science Foundation's proposed CyberInfrastructure). T1.1 provides adaptive algorithms to allow WP2 and WP3 to implement this feature in causal knowledge discovery and discovery in federated networks. Miguel: Keep elaborating

Task T1.2: This task extends T1.1 into multilayer network metrics for general principles of data discovery (M1-M18) *Leader: **IFISC-CSIC**. Contributors: 2*

Multilayer network metrics [10, 12] for evolutionary semantic algorithms will focus on large pools of data heterogeneity to explore how data configurations, privacy requirements, formats, dimensions, biases and spatiotemporal resolution affect data discovery [2–4, 6]. Victor, Emilio: Keep elaborating

Task T1.3: Based on the framework developed in T1.1 and T1.2, ICREA will derive automation rules for data discovery (M15-M21) *Leader: **ICREA**. Contributors: 3*

Automation rules [20] for evolutionary semantic algorithms and multilayer network metrics search and rules transformation for data discovery. Roger: Keep elaborating

Task T1.4: Reproduce (M15-M21) *Leader: **SDSC**. Contributors:*

In this task the SDSC will merge the work done in T1.1 and T1.2 into reproducible and replicable data knowledge graphs

Task T1.5: Visualize (M15-M21) *Leader: **SME**. Contributors:*

In this task the partner SME will apply visualization algorithms to the work done in T1.1 and T1.2 Charles and Miguel: Keep elaborating

Task T1.6: All participants apply results from evolutionary semantic algorithms and multilayer network metrics into a fully automated, reproducible and animated sustainability exploitation of the Seas case study (M15-M24) *Leader: **EBD-CSIC**. Contributors: 1,2,3,4,5*

Evolutionary semantic algorithms and multilayer network metrics will search and transform many source-data (i.e., Fishery data using the (global fishing watch), species interactions, environemental data and social and stakeholders groups with different interests within each of the countries, etc, together with the sustainability of the Seas database started in 1965 contains around 9 million entries, 1612 species, 20 countries and 11 sampling methods (Figure 2).

Deliverables

D1.1 Software evolutionary semantic rules for data discovery **(M18)**
D1.2 Report on definition of multilayer network metrics applied to data discovery **(M18)**
D1.3 Automated demonstrator of evolutionary semantic rules for data discovery **(M21)**
D1.4 Reproducible demonstrator of evolutionary semantic rules for data discovery **(M21)**
D1.5 Visualization demonstrator of evolutionary semantic rules for data discovery **(M21)**
D1.6 Demonstrator all parts for the sustainability exploitation of the Seas case study **(M24)**

Work package number 2	**Lead beneficiary** TARTU	
Work package title	**Causal knowledge discovery**	
Participant number	6	7
Short name of participant	EAWAG	TARTU
Person month per participant	9 (Provisional)	6 (Provisional)
Start month	7	
End month	30	