Geo-Semantic framework will serve three use cases:

Use case I: Semantic annotations and resource alignment

- Add a dataset
- Link Prediction
- Annotates

Use case II: Linked Standard Names and knowledge integration

- Knowledge base layer: it stores the Standard Names graph and semantically enabled models.
- Knowledge management layer: it is responsible for reasoning, logic ingestion, semantic processing, and indexing of new resources.
- Application layer: it provides the different web services.

Use case III: Knowledge discovery

- Knowledge integration service
- Search resources
- Spatial annotation predicates
- Temporal annotation predicates

Goal and Vision

Develop a decentralized knowledge-based platform that allows semantically heterogeneous systems to interact with minimum human intervention.

We will build on two existing technologies:
- SEAD (Sustainable Environmental Actionable Data): it supports the full life cycle of long-tail data including collection, curation, discovery, sharing, and preservation.
- CSDMS (Community Surface Dynamics Modeling System): it supports the conversion of existing models into a plug and play system for interoperable integration.

We will also integrate with ongoing EarthCube initiatives including GeoSoft, Earth System Bridge, SEN (Sediment Experimentalist Network), and eWELL (Workforce Education and Learning Library).

Contributions

- Scientific contribution:
  - Geosemantics framework will directly augment the multidisciplinary interaction between different geoscience communities by minimizing the human intervention in semantic mediation between resources and their context ambiguity, and supporting the "crosswalks" among geoscience Standard Names.
- Technical contribution:
  - Graph knowledge base for storing linked Standard Names.
  - GeoSemantics Wiki system for geoscience communities to annotate their Standard Names.
  - Knowledge Discovery Service for retrieving the graph of a data node and infer the contextual association between resources.
- Semantically enabled models as a foundation for advancing Model-as-a-Service.
- Resources Alignment Service for handling the semantic mediation between model and data resources.
- Semantic Annotation Service for annotating resources with standard names, encapsulated Standard Names, and incorporating semantics into development of models.
- Knowledge Integration Service for ingesting Standard Names, reasoning over their definition, and code the inferred relationships using SKOS vocabularies.

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Contacts

- Feedback: http://workspace.earthcube.org/geo-semantic
- Source code: https://opensource.ncsa.illinois.edu/stash/projects/EGCS
- Geosemantics Wiki: http://eecs-dev.ncsa.illinois.edu/wiki