Ontology

of

Ecological Affordances:

What, Why and How

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Why?

Why?

What fundamental questions are we trying to answer?

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Filling out the Biodiversity Knowledge Graph

Modeling ecological interactions

Extension of biogeography to traits

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Why Ontology ?

Why Ecological ?

Why Affordances ?

Why?

What fundamental questions are we trying to answer?

Why Ontology ?	**Filling out the Biodiversity Knowledge Graph**
Why Ecological ?	**Modeling ecological interactions**
Why Affordances ?	**Extension of biogeography to traits**

Bonus Goals I:

Principled Trait Selection

Relevant Functional Traits

Dimension Reduction

Bonus Goals II:

- Framework for Modeling Interactions
  - Organisms and Environments
  - Mutualism
  - Organism as Environment

What?

What?

Ontology

An ontology encompasses a representation, formal naming, and definition of the categories, properties, and relations of the concepts, data, and entities that substantiate one, many, or all domains.

What?

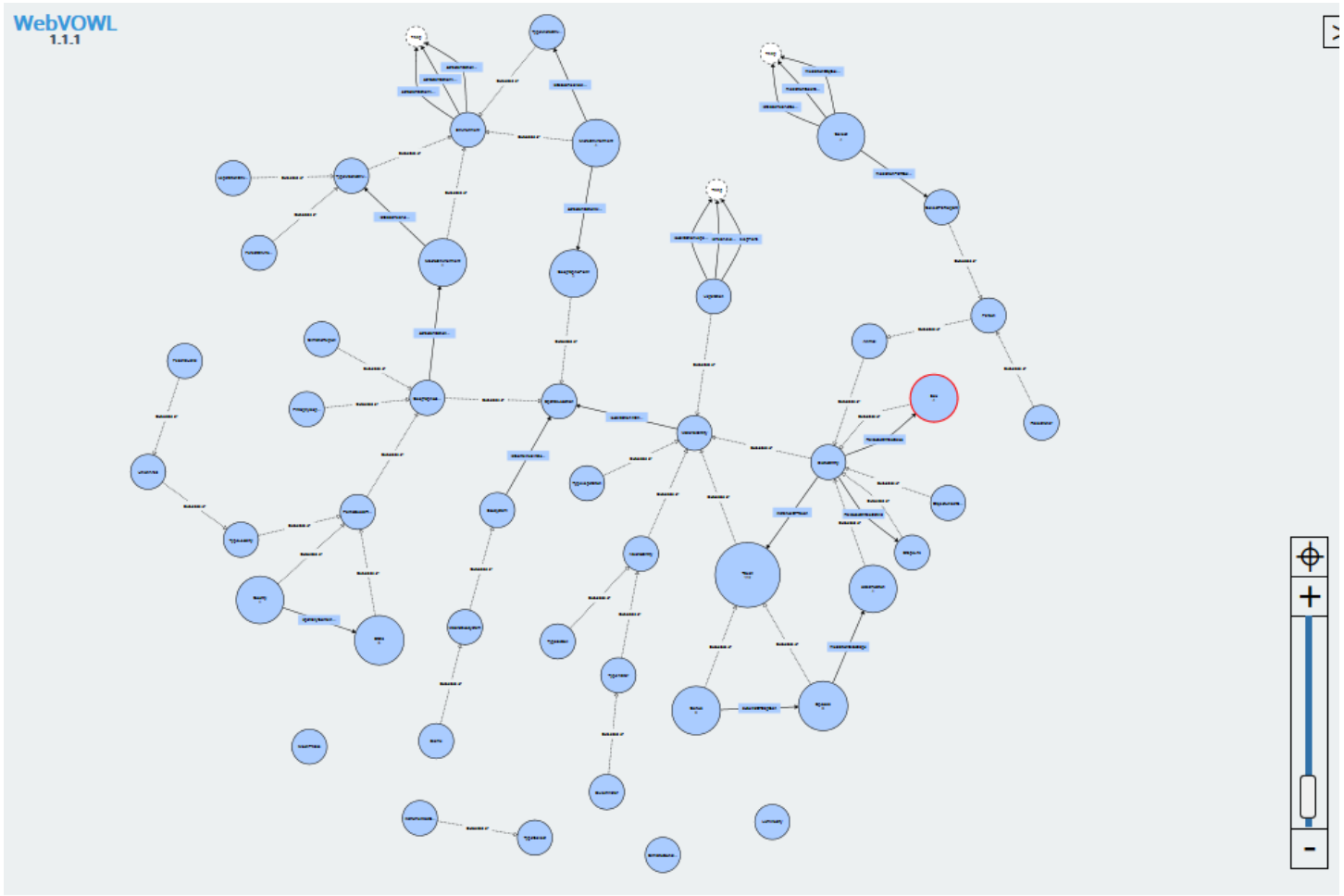
Affordance

The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. The verb to afford is found in the dictionary, the noun affordance is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment.

— Gibson

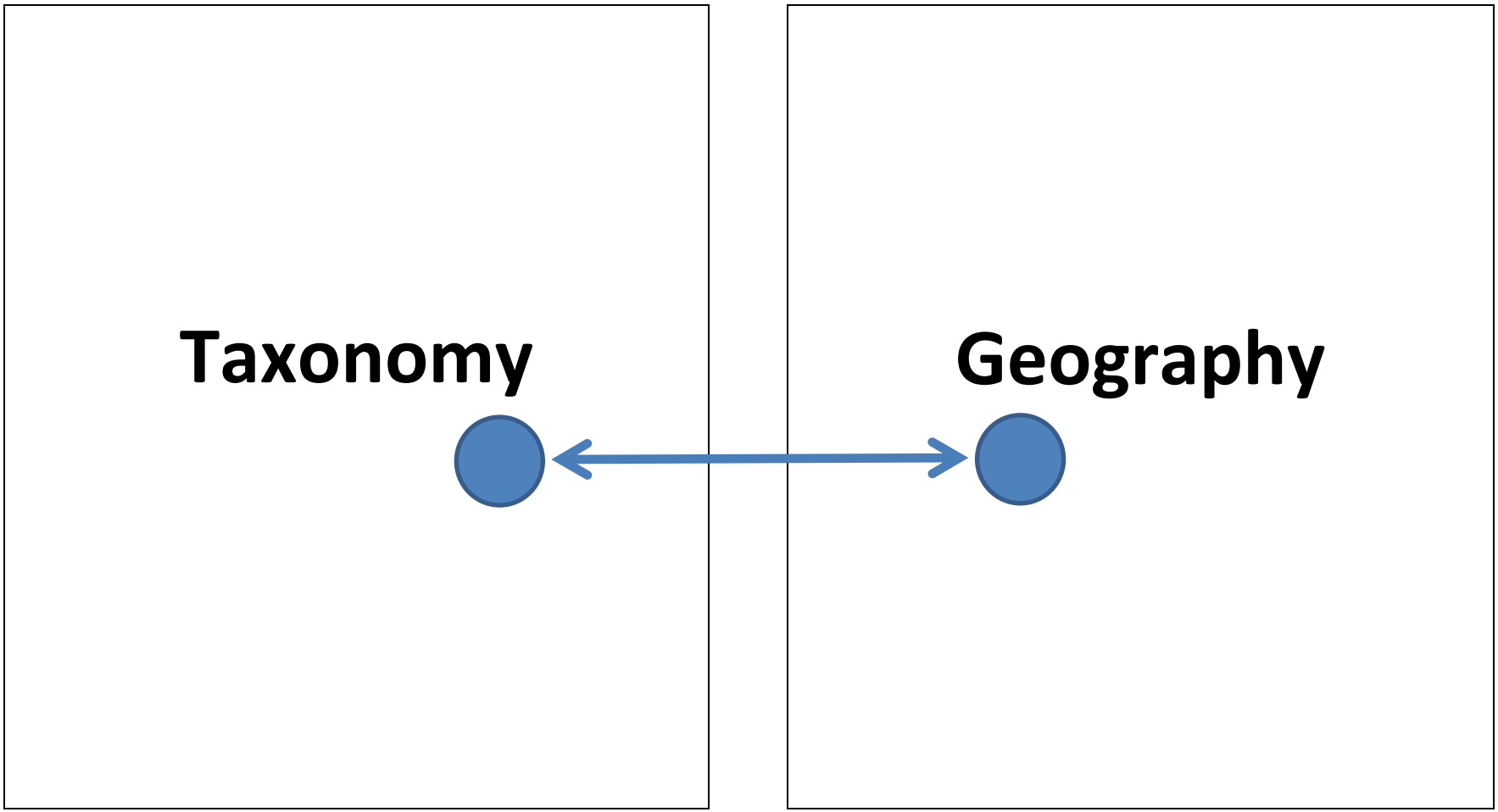
What?

Integrated with Biodiversity Knowledge Graph



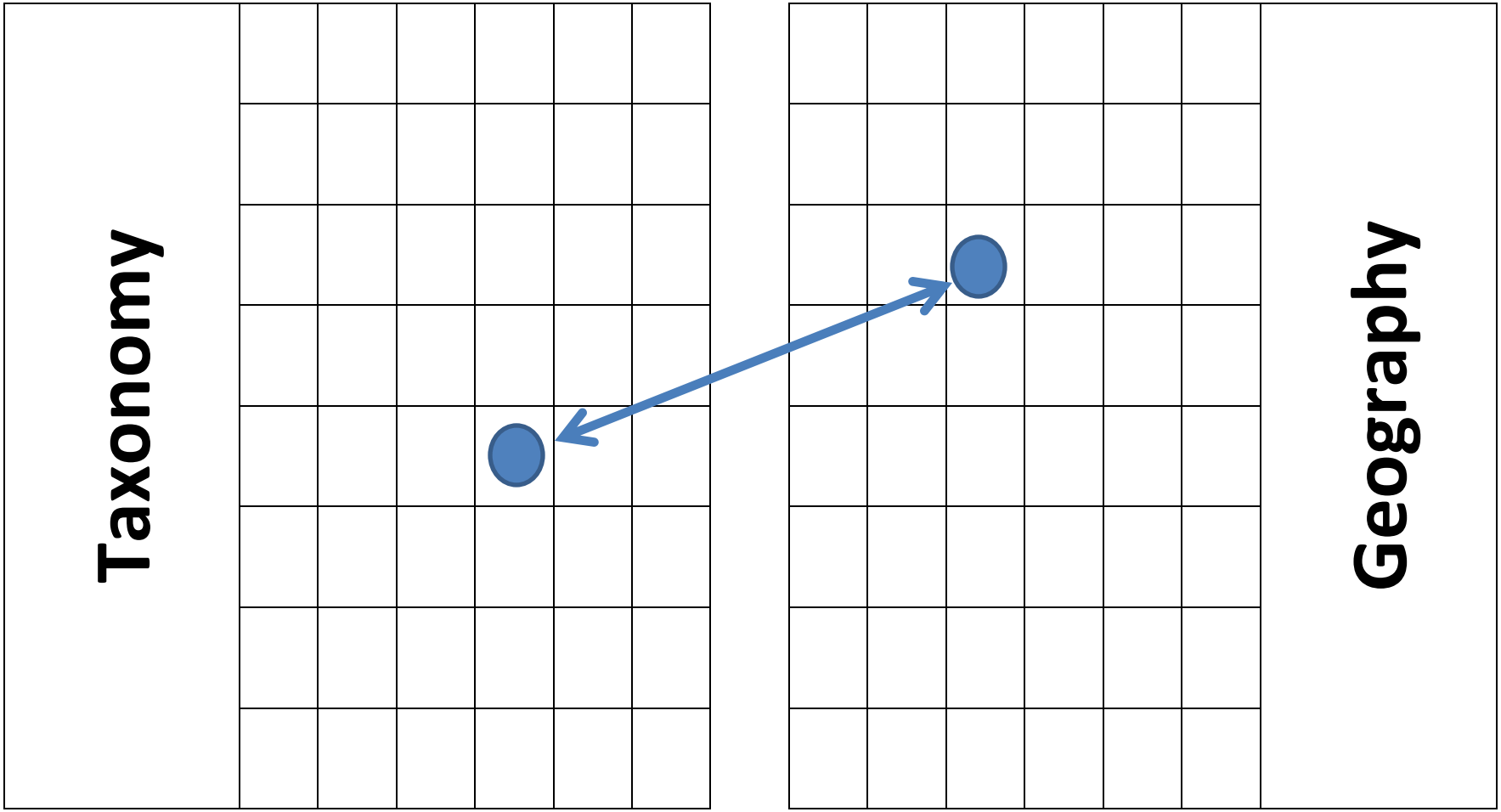
What?

Integrated with Biogeography



What?

Integrating Traits with Biogeography



How?

How?

Ontological Engineering

How?

Ontological Engineering Resources

Open Biological and Biomedical Ontology (OBO) Foundry

www.obofoundry.org

National Center for Biomedical Ontology (NCBO) BioPortal

bioportal.bioontology.org

Semantic Web

Web Ontological Language (OWL)

How?

- **Modular Ontologies**
  - **Namespaces**
  - **Base (“Top Level” or “Foundational”) Ontology**
  - **Domain Ontology**
  - **Granularity / Strata**
  - **Interface Ontology**

Rebasing

Stitching

Pruning

Candidate Ontologies

- Base (“Top Level” or “Foundational”)
- Domain
- Strata
- Interface

Issues I: Affordance as

Occurrent

Event

Continuant

Dependent Continuant

Quality

Of Organism Perception

Of Environment

Of “Animal – Environment System”

Disposition

Relation to Function

Issues II: Measuring Affordance

Working Definition

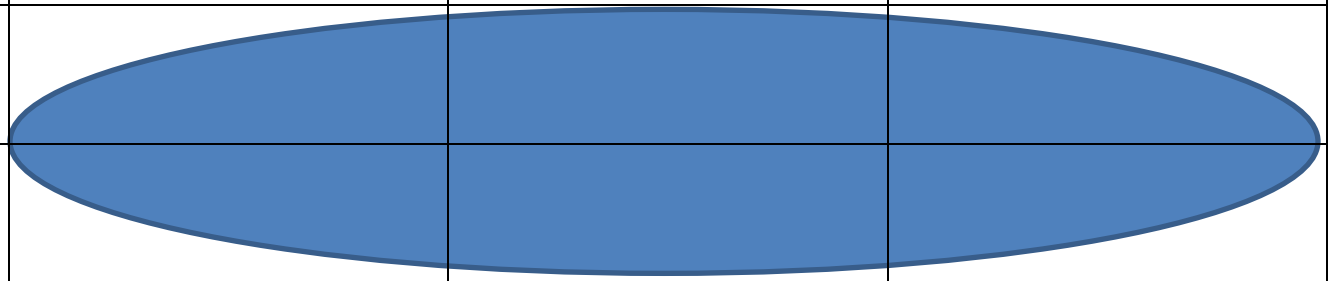
Affordance:

A relation indicating a joint disposition among organisms and their environments.

Visualization

Ontology Components

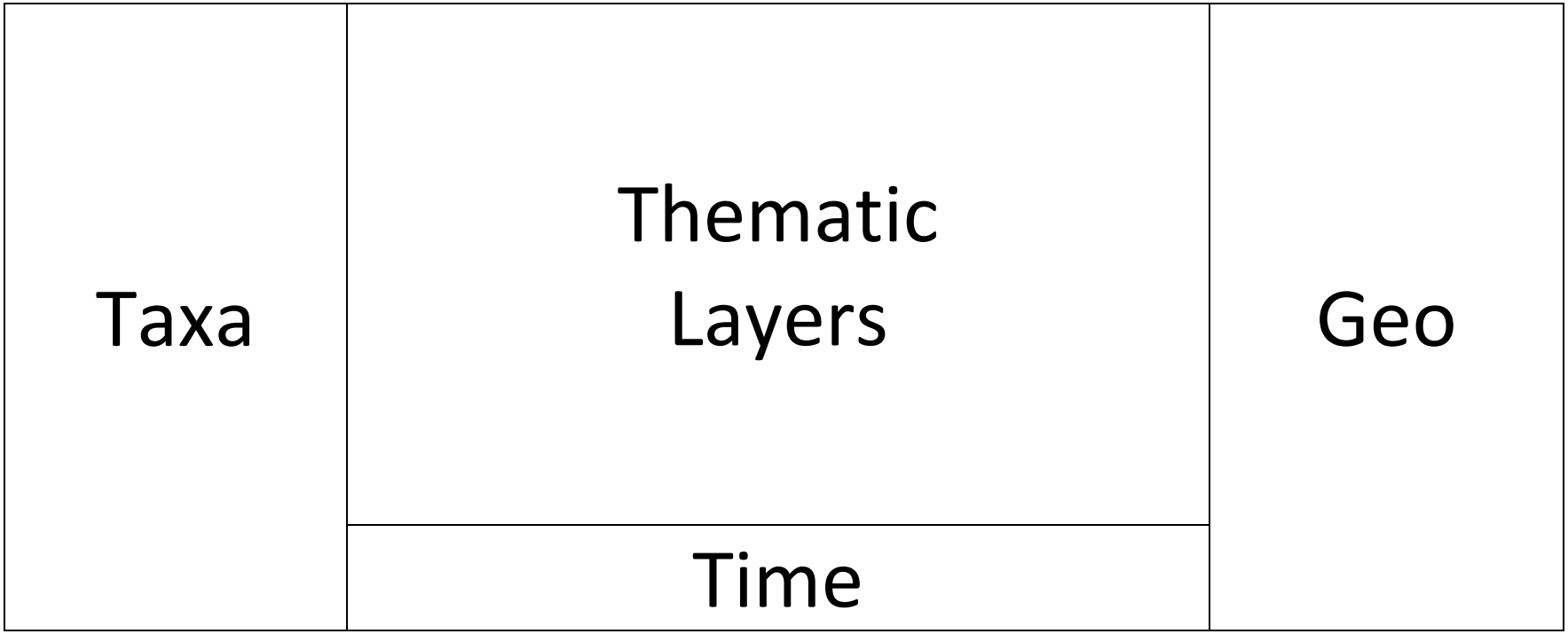
	Continuant		Occurrent
	Independent Continuant	Dependent Continuant	
Ecosystem			
Organism			
Cell			
Molecule			



Visualization

Biodiversity Knowledge Graph

Overview **Zoom and Filter** **Details on Demand**



Thank you!

Quick Questions?

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