

# ***BEST***

*Building biodiversity into an ecosystem service-based approach for resource management*

## **How does land use affect multiple ecosystem services?**



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# Focal questions

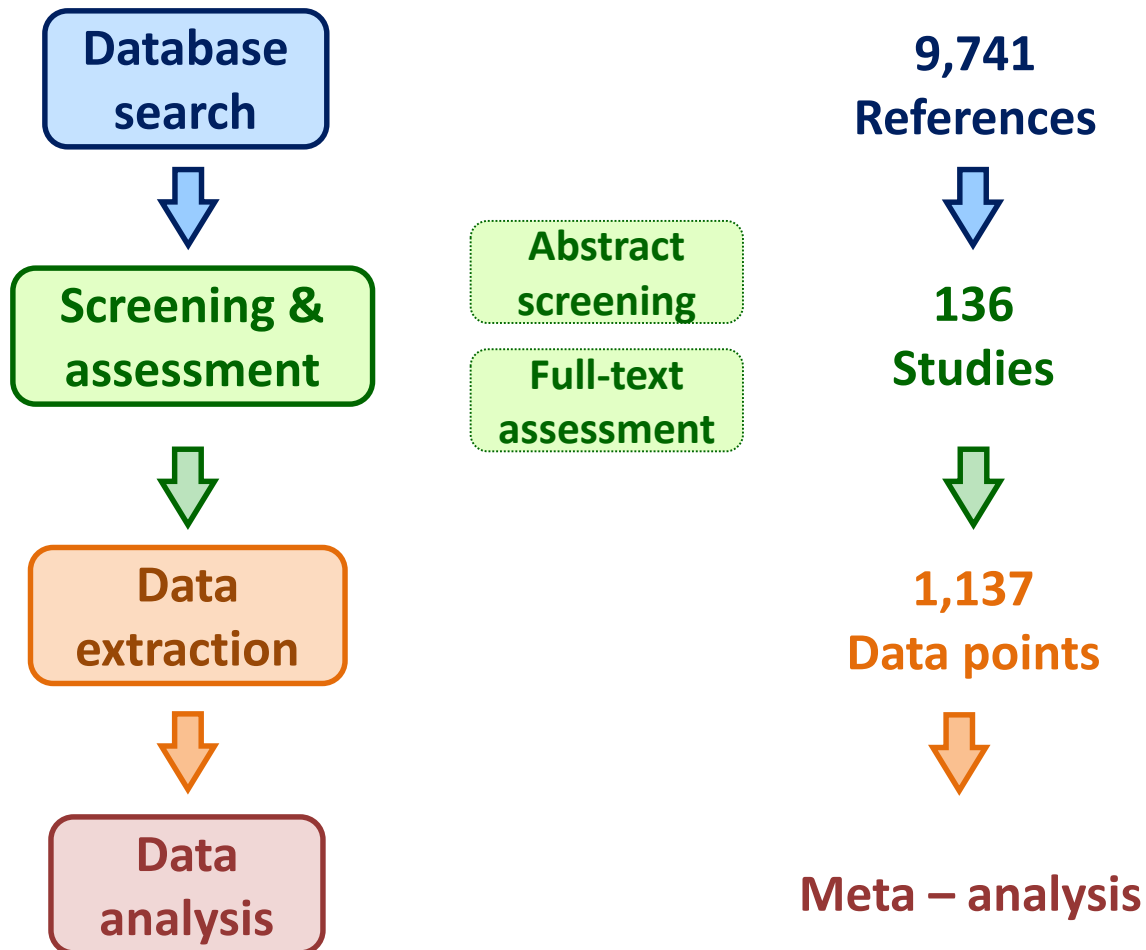
- How does service provision correlate across land uses?
- How do you maximise flows of all services and their resilience at broad (e.g. catchment) scales?
- Does biodiversity tell us anything about services that land use doesn't?

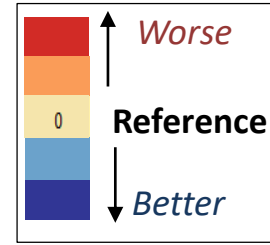
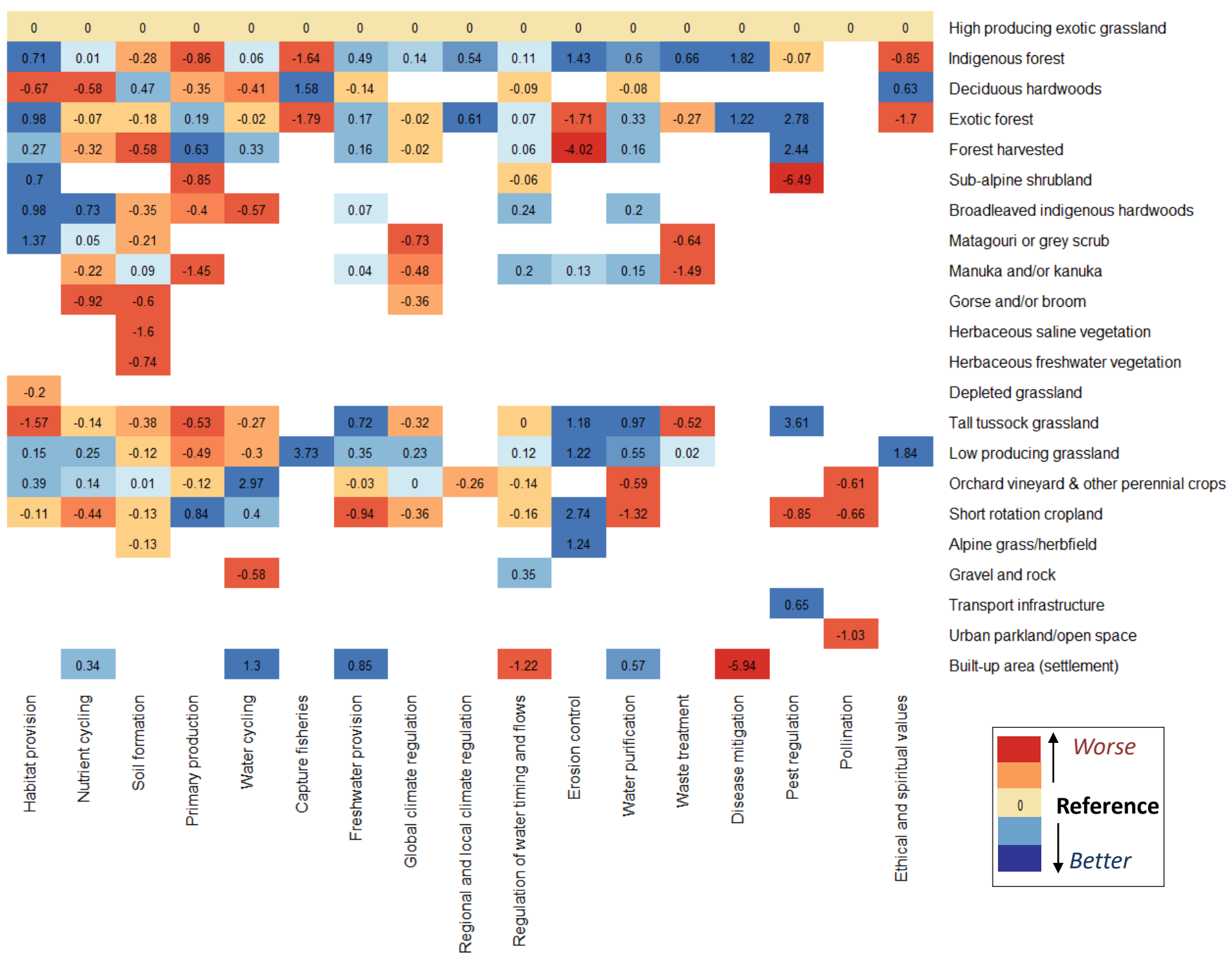
# Literature survey & meta-analysis

**Land cover effects on ecosystem service provision in New Zealand  
(1970 – 2015)**

# Literature survey & meta-analysis

Land cover effects on ecosystem service provision in New Zealand  
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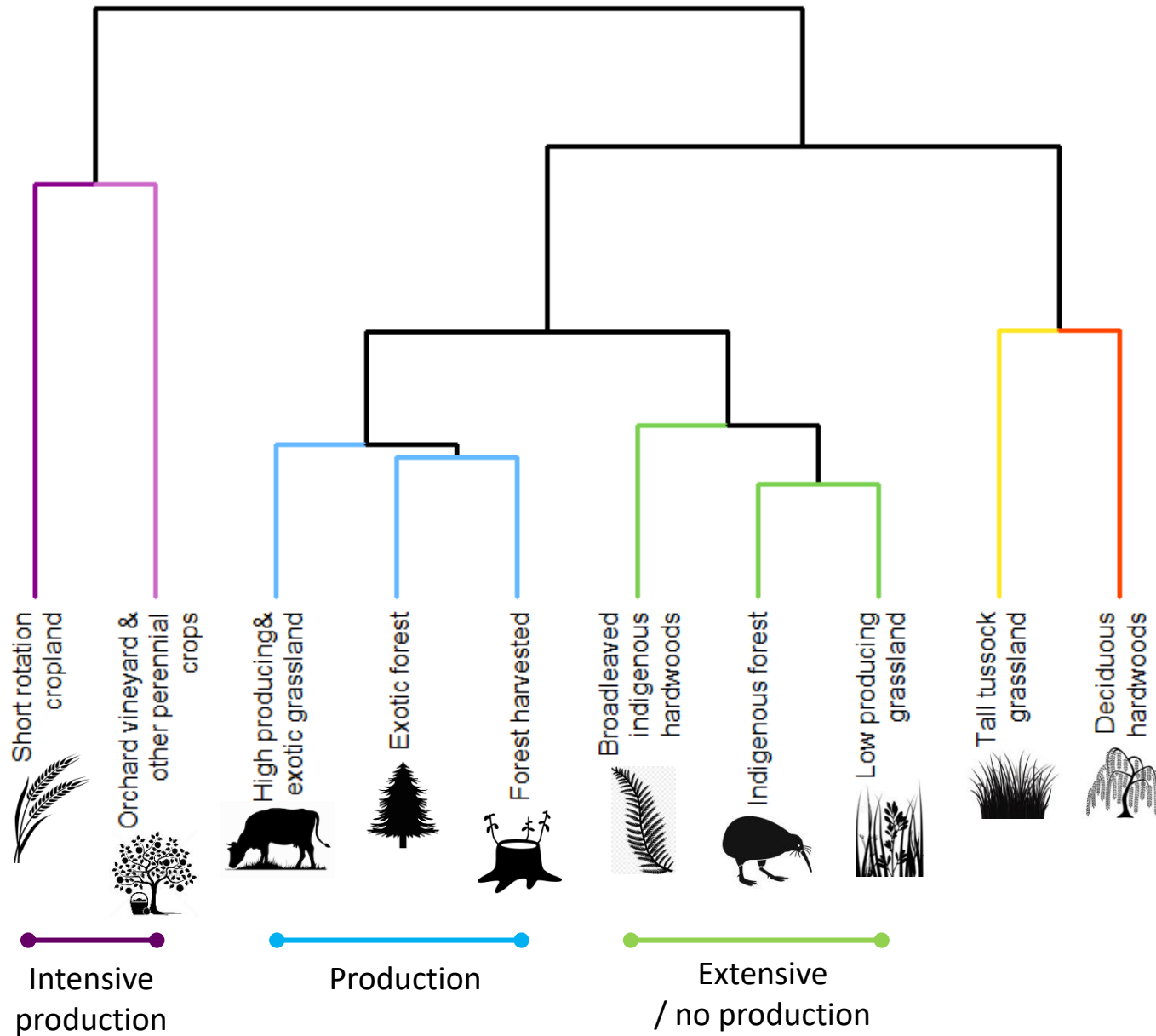


# First take-home messages

- No “silver bullet” land cover to provide all ecosystem services
- Trade-offs are always present
- Provisioning of multiple services requires a mosaic of land covers in the landscape

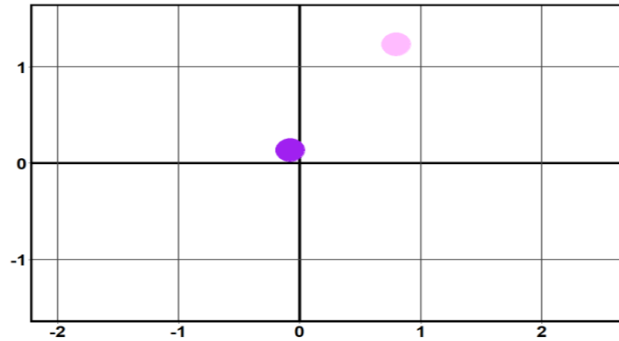


# Land cover differences in ecosystem services

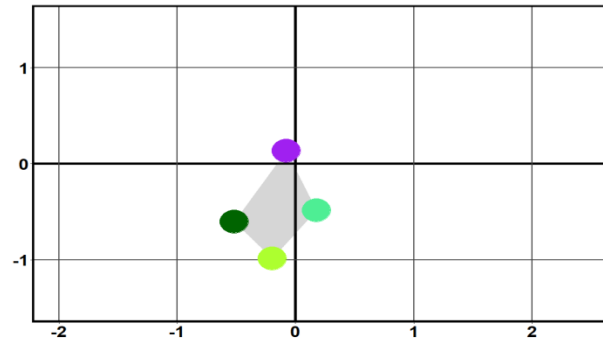
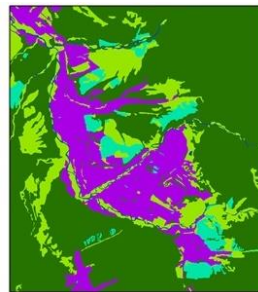


# Multiple service provision across landscapes

Case 1



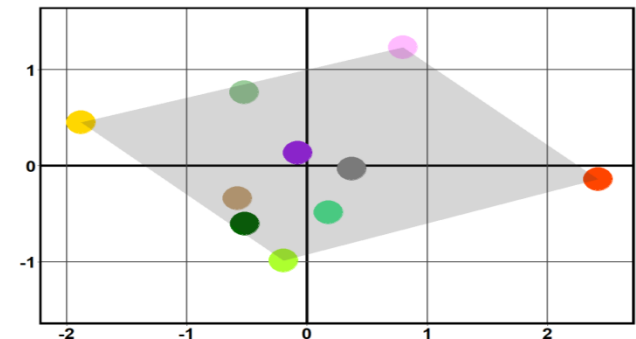
Case 2



## Land covers

- Broadleaved indigenous hardwoods
- Deciduous hardwoods
- Exotic forest
- Forest harvested
- High producing exotic grassland
- Indigenous forest
- Low producing grassland
- Orchard, vineyard & other perennial crops
- Short - rotation cropland
- Tall tussock grassland

Case 3





# Second take-home messages

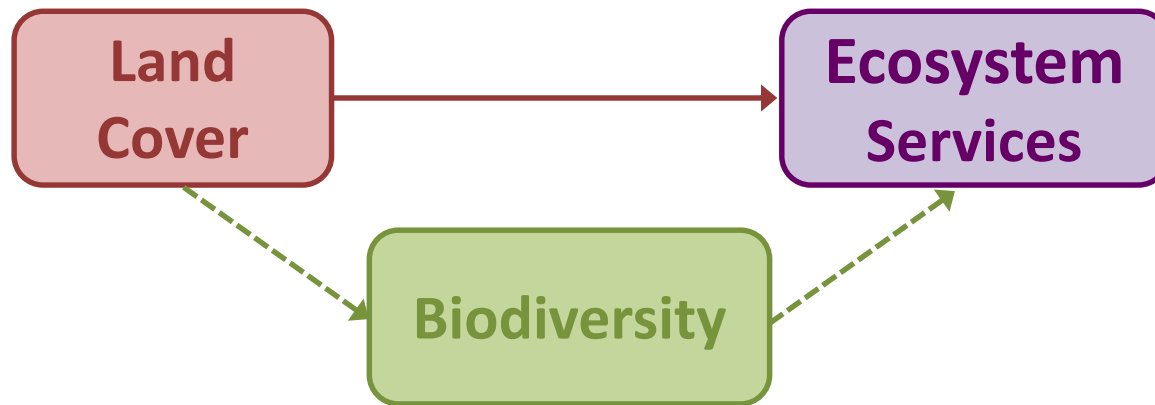
- Land covers provided similar services if they had the same:
  - Production intensity (presence of native vegetation cover) ✓
  - Forest cover ✗
- A balance between **diversity** and **redundancy** of land covers is needed to supply multiple services



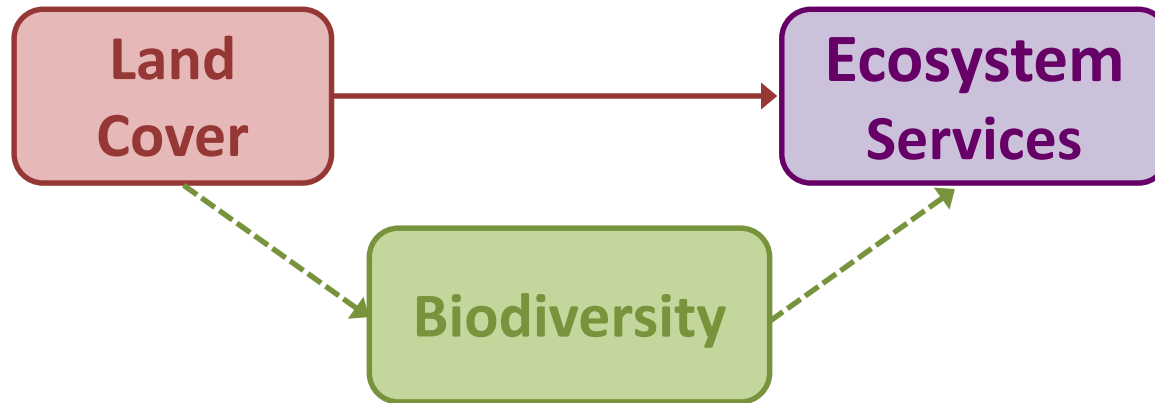
# Does biodiversity tell us anything that land cover doesn't?



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**11 studies also had biodiversity data  
(species richness)**



# Third take-home messages

- Land cover often provides a **good surrogate** measure for the effect of biodiversity on ecosystem service provision
- **Exceptions** to this are:
  - Habitat provision
  - Regulation of water timing & flows
  - Erosion control
- Improving biodiversity could **alleviate** or **intensify** land-cover impacts on:
  - Habitat provision
  - Water cycling
  - Nutrient cycling



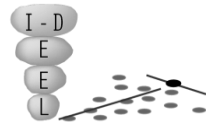
# Special thanks to:

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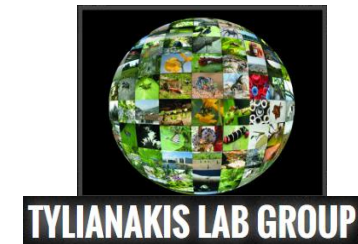


INTER-DISCIPLINARY  
ECOLOGY AND  
EVOLUTION  
LAB



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the  
**Stouffer  
Lab**

complexity  
in ecology

**& many thanks to you...**

