

Big ecological questions



Big ecological questions

Operating principles

Big ecological questions

Operating principles

- Many questions in fungal ecology are in a larger context, which is important to consider as we frame ecological research directions.

Big ecological questions

Operating principles

- Many questions in fungal ecology are in a larger context, which is important to consider as we frame ecological research directions.
- Time is right for interactions with the genomics community.

Big ecological questions

Operating principles

- Many questions in fungal ecology are in a larger context, which is important to consider as we frame ecological research directions.
- Time is right for interactions with the genomics community.
- We can provide a variety of products to the larger community, including selection of fungi for genome sequencing, standardized methods, and ontology for environmental sequences.

Big ecological questions

Major questions

Big ecological questions

Major questions

- 1. How can we link ecological diversity with phylogenetic diversity and species diversity?**

Big ecological questions

Major questions

1. **How can we link ecological diversity with phylogenetic diversity and species diversity?**
2. **Can we develop predictive ecology** -- making predictions based on genomics, and testing those at the levels of both individual species and *communities*)

Big ecological questions

Major questions

1. **How can we link ecological diversity with phylogenetic diversity and species diversity?**
2. **Can we develop predictive ecology** -- making predictions based on genomics, and testing those at the levels of both individual species and *communities*)
3. **What are the rules of community assembly for multi-lineage communities**, considering stability, restoration, remediation, and temporal and spatial context-dependency?

Big ecological questions

A few related suggestions

1. We should send someone to the NEON meeting in February.

Big ecological questions

A few related suggestions

1. We should send someone to the NEON meeting in February.
2. Large-scale projects: need consistent methods, temporal coherence, and rigor.

Big ecological questions

A few related suggestions

1. We should send someone to the NEON meeting in February.
2. Large-scale projects: need consistent methods, temporal coherence, and rigor.
3. Need to package surveys into something more dramatic, but we can still go after fundamental questions.

Big ecological questions

A few related suggestions

1. We should send someone to the NEON meeting in February.
2. Large-scale projects: need consistent methods, temporal coherence, and rigor.
3. Need to package surveys into something more dramatic, but we can still go after fundamental questions.
4. Can use existing data to address novel, or at least unanswered questions.

Big ecological questions

A few related suggestions

1. We should send someone to the NEON meeting in February.
2. Large-scale projects: need consistent methods, temporal coherence, and rigor.
3. Need to package surveys into something more dramatic, but we can still go after fundamental questions.
4. Can use existing data to address novel, or at least unanswered questions.
5. Should tap into existing frameworks: e.g., 50ha forest dynamics plots, Tilman diversity plots, LTERs.

Big ecological questions

Hypotheses that could be addressed with a new, whole-community approach:

Everything is everywhere (beta diversity)

Latitude and altitude gradients

Diversity is related to stability/resilience/etc.

Microbial/fungal ecology in the context of the biodiversity crisis

- Understanding the microbial associates of endangered species
- Relating the success/eradication of invasive plants and pathogens in their new and original ranges
- Understanding the factors that shape endemism or limit spatial or geographic distributions
- Assessing the microbial effects of land use change, global and local environmental change (CO₂, nitrogen, etc.).

Diversity surveys: hard to sell, but really important

Health: planetary, local (soil), animal, plant

Interactions: at every level

Astrobiology: sure, why not?