

# Closing Thoughts

In some respects, we have some very sophisticated modeling. And we have a framework now in which we can easily extend/incorporate some classes of biogeographic processes.

But in other respects, the field is still very primitive:

- Incorporation of lineage-dependent ecologies: lineages have different dispersal/extinction or even speciation capabilities due to distinct ecologies (*actually, this is a little bit of setup: we currently have some work submitted that does exactly this, including allowing for the ecologies to evolve over time!!!*)
- “Colonization saturation” /incumbant-advantage conditioning colonization probabilities.
- Handling of multi-scale dispersal dynamics (e.g., within-archipelago, between archipelago).
- Incorporation of effects of population size (maybe as correlates of areas-of-occupancy size) and other “micro-evolutionary” processes.

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We have only visited a very narrow field of questions, mostly to do with areas of origin, ancestral areas, and dispersal patterns out of those areas (in fact, the very focus of the earliest biogeographical *analyses*)!

What other questions can we ask?

Are we limited by lack of methods (e.g. because we are not modeling lineage ecologies and evolution, we cannot ask questions about lineage ecologies)?

Or lack of imagination?

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The “big data” revolution in phylogenetics ... how much of an impact on biogeography?

Sure, our trees are better (in particular, *lots* of room for improvement in time estimates), but otherwise?

Anticipating tomorrow's discussion, IMHO, for biogeography we need better models, not more data.

Though I am not going to turn down more data!