ch2 - Shifts in the individual size distribution decouple the long-term trends of abundance, biomass, & energy use of N. American breeding bird communities.

scope

Ok, so here we're going to take a more synthesis-oriented view of how changes in community ~~fraction~~ ~~affect~~ structure modulate the long-term dynamics of different dimensions of community function. ~~Specifically,~~ we're ~~going~~

Δ abund

Specifically, we're going to look at the long-term changes in ~~a~~ community-wide abundance for bird communities across North America: overall, are we seeing declines, increases, ~~no change~~ or no clear overarching directional change in abundance? ~~and how does~~ and does this signal depend on how we measure abundance?

community scale.

Working at the community scale ~~This~~ can help slot into an important niche in our ~~~~ ~~~~ appreciation for how biological diversity is changing. ~~Most work in this space~~ In a contrast to focusing on the trajectories of individual populations, or continent-wide or even global changes in abundance, at the community scale we see the interaction between population trends and community ~~ecology~~ level properties — such as competition and compensation, or shifts in composition to track changing conditions, in an echo of the phenomena we dealt with in ch 1 — that can buffer community abundance against changes at other scales. We're going to explore the consequences of these community-level changes for how we think about the relationship btwn different ~~currencies~~ ~~for~~ dimensions of ~~abundance~~ change in abundance.

community properties.

currencies

~~~~ There are different ways of ~~~~ quantifying community-wide abundance. We can think in terms of the total number of individuals, or in terms of total biomass or total metabolic flux. These tell us about slightly different ~~dimensions~~ of If nothing else changes about a community over time, we'd ~~naturally~~ expect the long-term dynamics of
~~~~

currencies.

these currencies to fluctuate proportional to each other.
However, if the ~~species composition~~ distribution of body sizes of individual organisms in the community changes, the dynamics of N, M, B may become de-synchronized. For example, a ~~systematic~~ community-wide shift favoring larger species → ~~an~~ potentially no Δ in total biomass, even if N ↓.

Decoupling

Changes in the size structure can be indicative of important functional shifts in a community. Body size is strongly correlated with numerous ~~of~~ functional traits, and so jump near. ~~We~~ ~~This~~ ~~has~~ ~~been~~ ~~observed~~ ~~in~~ ~~…~~ ~~The~~ We've seen this, for example, at our field site where the rodent community has shifted in favor of small bodied species due to a major habitat transformation. Similar principles also crop up in, for example, fisheries management where the relationship between abundance and biomass is used as an indicator of ecosystem status.

Decoupling can signal functional Δ!

So we are interested in how these currencies change ~~relative to~~ ~~each other~~, both bc they tell us different things on their own, and bc nuances in how they change relative to each other may be indicative of more extensive Δs within a community.

thesis-y stmnt. why currencies, why decoupling.

While there's a deep history of this work in aquatic and tree communities, we know relatively little about how N, B, E, and the size structure behave for terrestrial animals.

Gap & why.

data, stats

Here, we [solve those], using recent ~~…~~ stat dev, modern compute, and BBS.