Hi Adam,

I hope that you are well, and can largely enjoy this very strange moment. Will you start your new job soon?

The new models are now ready for your and Lindsay’s simulation results. Neither your nor Lindsay’s model fits changed significantly, so I don’t think your take-home messages will change either. My central request for you is to prepare a document for each model like the one attached, where Nadja sets her model’s results into a biological framework, **explaining its emergent BEF patterns with respect to its underlying traits and mechanisms**. To that end, I’m also attaching a document for each model that describes its trait distributions, and how they reflect both monoculture biomass and competitiveness in mixture. You will also find fits for functional dispersion, both for the entire trait space and for each trait individually. **All of the documents can be found in my Dropbox,** [**here**](https://www.dropbox.com/sh/e0nkz4u08a3iiwq/AADCBgt5yleaLVkCKvTb_mlEa?dl=0)**.**

Also, for two of my original questions about Lindsay’s model, you had several competing hypotheses for the mechanisms generating its behavior. I followed up on these, making some graphs that may help you decide which options are true.

My first question was:

“*Why do the slopes of the intra-richness treatments estimates flip between the assembly and disassembly phase?”*

To which you answered:

*This is the question I'm least sure about. Partially, it might be related to one of the take-home's from Lindsay's EL paper - i.e. that one can still get positive overyielding, even if niche differences aren't big enough to allow for coexistence. During the assembly phase, we push in a lot of species that add to over-yielding, but can't coexist. Because, by definition, high-yielding species are more "dominant", they push down the shannon diversity. Another option, though, is that the seed addition routine somehow subtly gives an advantage to K-selected species that otherwise would have had lower biomass (e.g. if the seed addition is somehow artificially inflating the r for K-selected species).*

I don’t have any direct means to test whether the seed addition routine artificially advantages the K-selected species, but I plotted the relationships between monoculture biomass and the species’ traits, as well as the relationship between monoculture biomass and in-mixture biomass. Hopefully, this can illuminate some of the mechanisms involved. If anything else comes to mind that I could put together, I’m happy to oblige.

My second question was:

*“Could you elaborate on why the intra-richness slopes seem to level out with increased initial diversity?”*

To which you answered:

*Mostly, I think this is probably a sign of negative selection effects. That is, species that produce low biomass (i.e. "r-selected") can still persist in mixture, and "take" some resources away from the slower growing K-selected species. Thus, in monoculture, we find the highest possible yield, from a mixture that includes a single very productive species (note, this is slightly different from the results in the original paper, though that paper was for shorter time spans - we also modifie the model a bit from its original form, so we should be careful to mention in the paper that we don't expect the two models to behave identically). Since these negative selection effects basically put a "maximum" biomass constraint on diverse mixtures, it reduces the total possible variability along the y-axis, and therefore also reduces the slope.*

To inform this, I am attaching a markdown that shows how both complementarity and selection effects change within your and Lindsay’s model over time. It turns out that Lindsay’s model is dominated by complementarity effects, with some negative selection effects. I hope that this helps.

We’d like to set a deadline of **26.04.20** to return your thoughts. If that isn’t enough time, let me know and we can arrange something different. In a few days, I will also send a Doodle to everyone in our sub-group to arrange a discussion of the results in preparation to write the manuscript in May.

Don’t hesitate to email me if something is unclear, or you need other graphs from me!

Best,

Mike