Notes on progress in analyzing NutNet data:

* LRR may not work well for data with high variance – likely due to the fact that the LRR with a positive control response ratio dampens the overall effect.
  + Subtracting correction from both sides of response (LRR\_N – LRR\_Control x LRR\_P – LRR\_Control) constrains relationship to a 1-1 line, even if there is no temporal trend, but just random noise.
* I also think that we may not be looking for the right signal of a tradeoff. While in theory the single tradeoff axis makes sense, I think it’s important to remember that this change is realized in a community context, rather than on a pure species-by-species basis. For example, it’s difficult to quantify the R\* for a given species if its not grown in monoculture. The presence of a single, uniform tradeoff axis for two nutrient addition treatments would result in perfectly negatively correlated community change between two species assemblages.
* We know that nutrient addition causes decreases in species richness / reduction in SAD evenness. If nutrient use trade-offs may be the driver behind observed multiple nutrient addition effects on plant diversity, what sort of figures would that produce?
  + For species to exist on a single, negatively correlated axis, responses would have to be entirely different depending on what nutrient is added. While this is perhaps a way we could measure tradeoffs in individual biomass change when grown individually, it ignores the effects of **competition.**
  + Instead of a simple linear response, I predict that we will see a “diamond” response in contexts where a tradeoff exists. When comparing two different nutrient addition treatments, I think we can divide species responses into 4 main categories:
    - **Uniform decreasers:** With most fertilization treatments, nutrient enrichment reduces plant diversity – increasing the abundance of a few species comes at the expense of the many. These are the many. Whether these species are better colonizers, rely on temporal mechanisms of coexistence, etc., a majority of species responses to nutrient enrichment should be negative, regardless of nutrient identity.
    - **Uniform increasers:** Species that increase in response to both added nutrients. Can occur in situations where there are too few species to produce a consistent tradeoff, multiple nutrient limitation of a dominant species, etc.
    - **Conditional increasers:** *These* are the species that I think are most interesting. If there are nutrient use tradeoffs, this is the primary axis on which they will be distributed, and is particularly relevant to our desire to understand how multiple nutrient limitation controls patterns of diversity loss.
* **How do we quantify?**
  + Community site scores – is change on the aggregate community level correlated with nutrient enrichment? Do sites converge or diverge with nutrient identity?
    - Custom PerMANOVA contrasts – are groups compositionally distinct?
    - Multivariate angles of compositional change – is change occurring in the same direction?
  + Then, delve into species-level responses – what species most drive differences between N and P enriched communities? Indicator species values?

