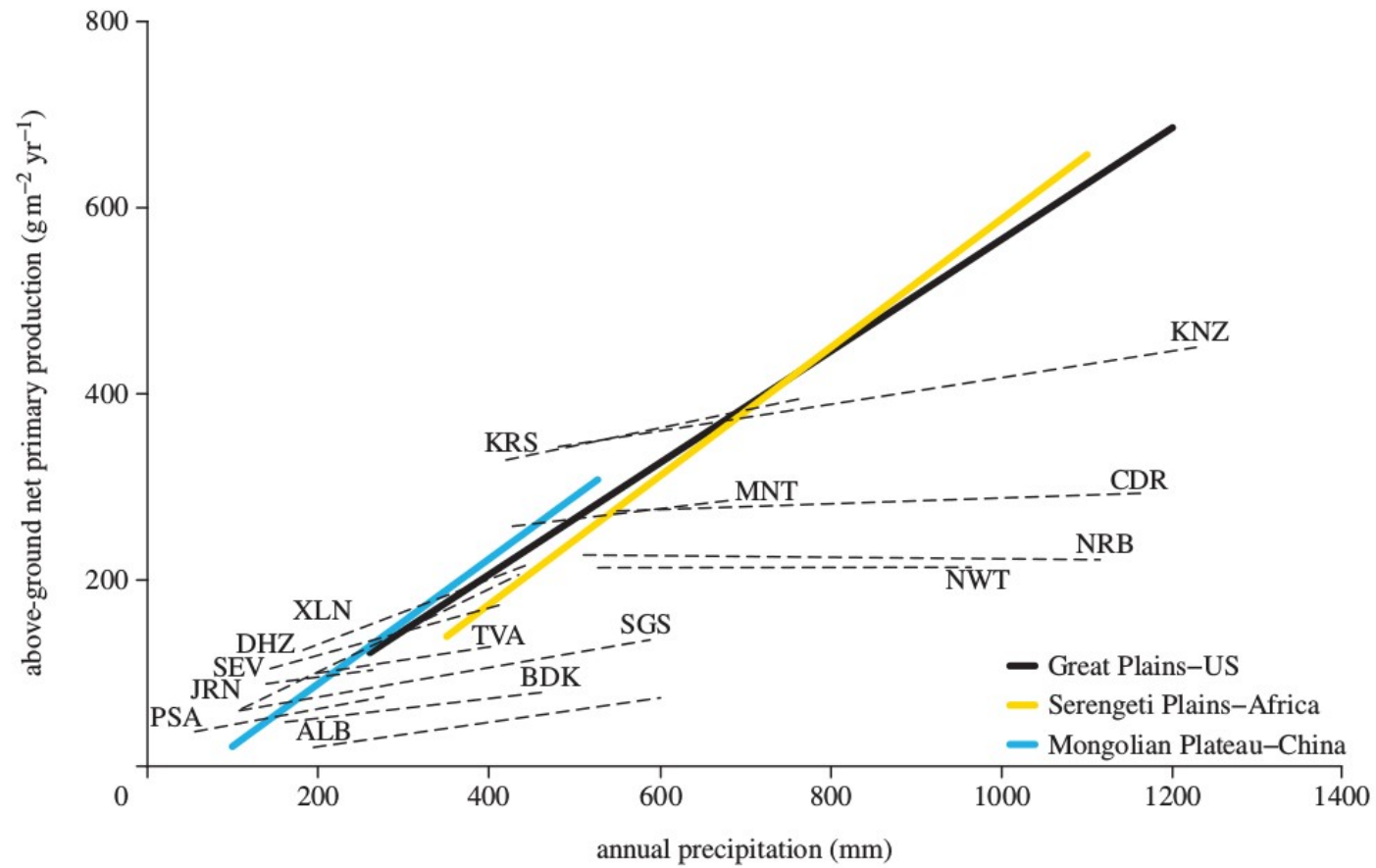


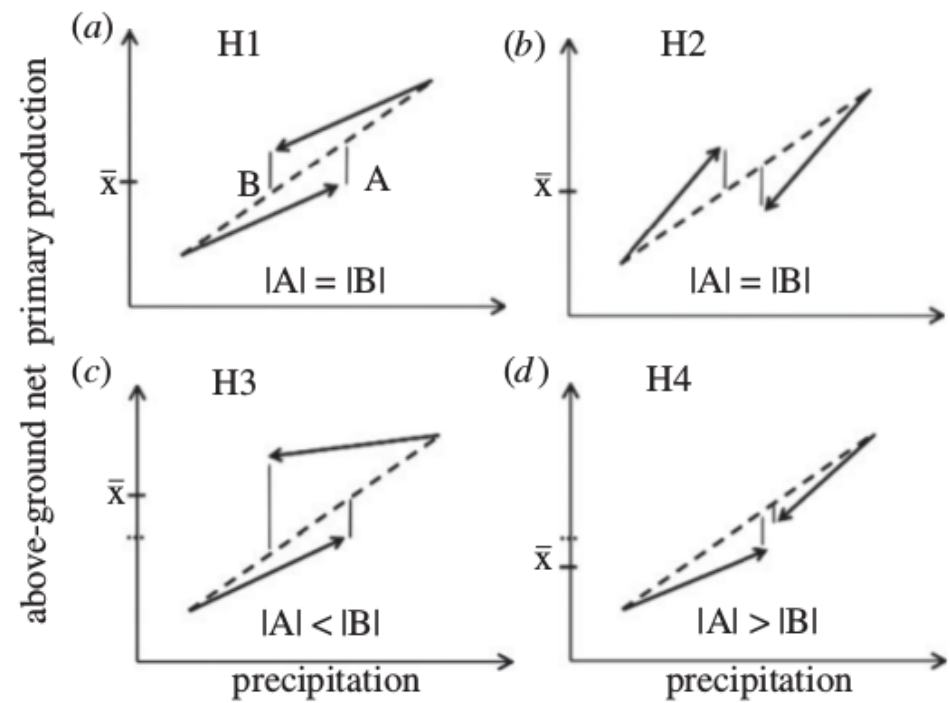
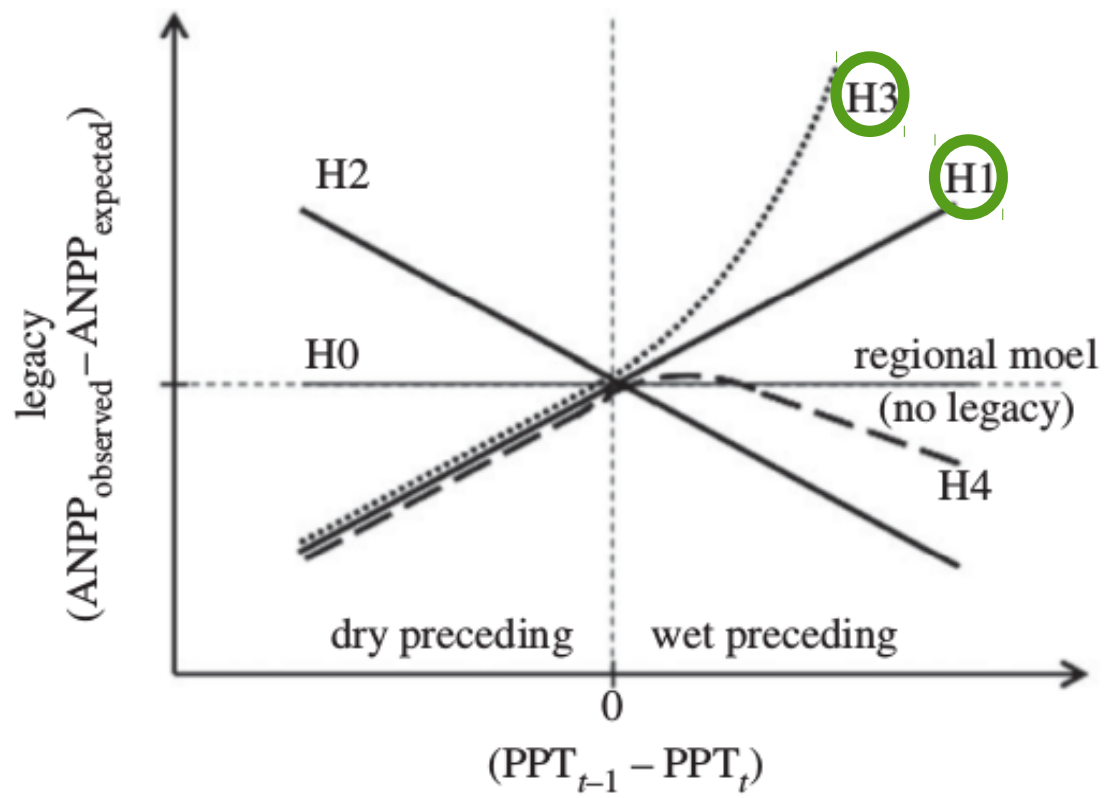
Legacy effects of Precipitation in LTER Experiments.

Siddharth Iyengar
Eric Seabloom
Elizabeth Borer

WG Outline

- Science ideas – legacies and memory.
- A method – stochastic antecedent modelling.
- Some data.
- Brainstorming ideas.





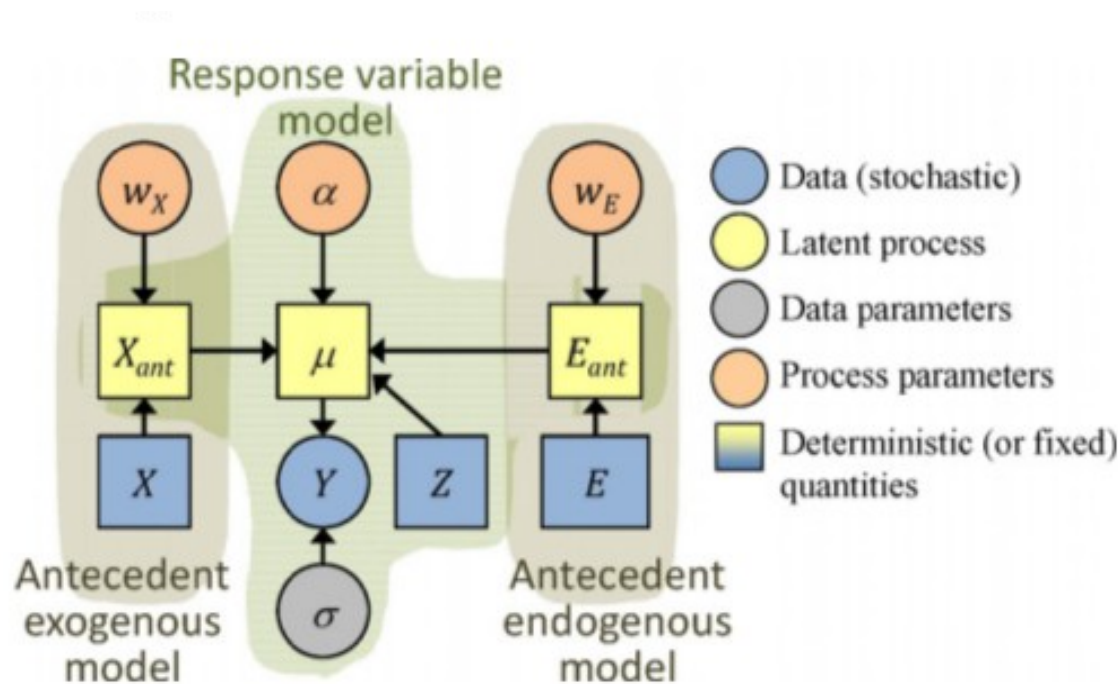
Mechanisms of Legacies

- Structural: Stolon Density (Reichmann et al 2014)
- Compositional: Seed bank
- Biochemical: Soil N availabilities
- Soil water carryover
- Litter feedbacks
- ...???

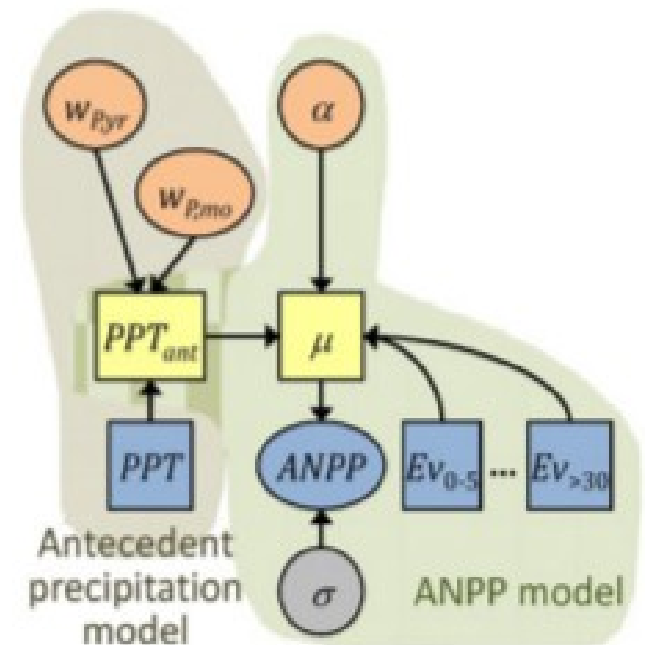
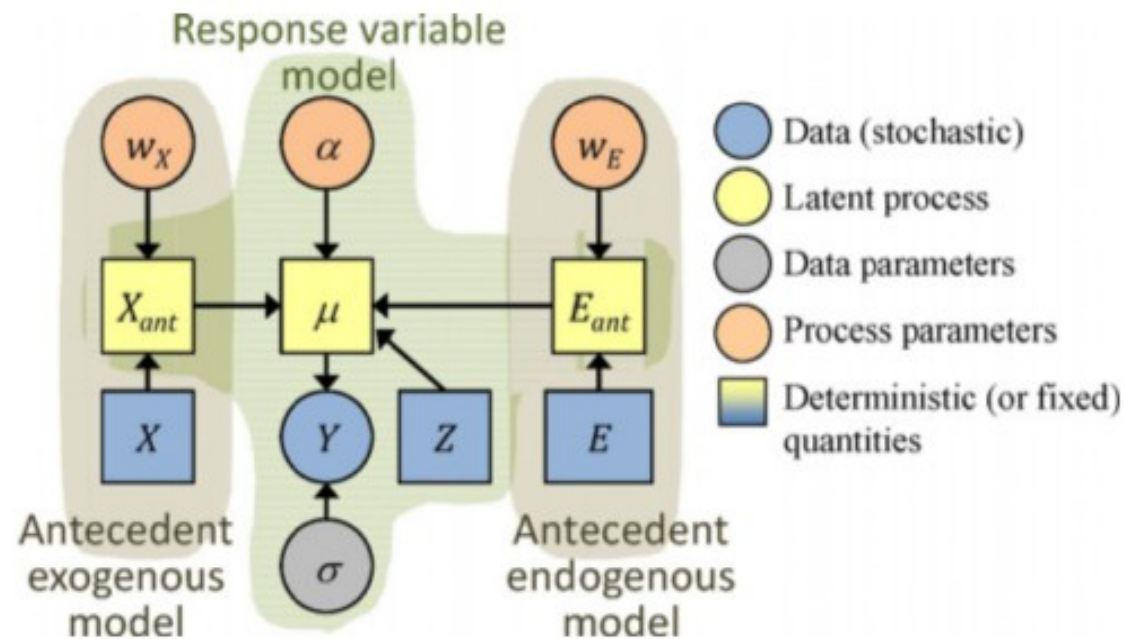
How do experiments change legacies?

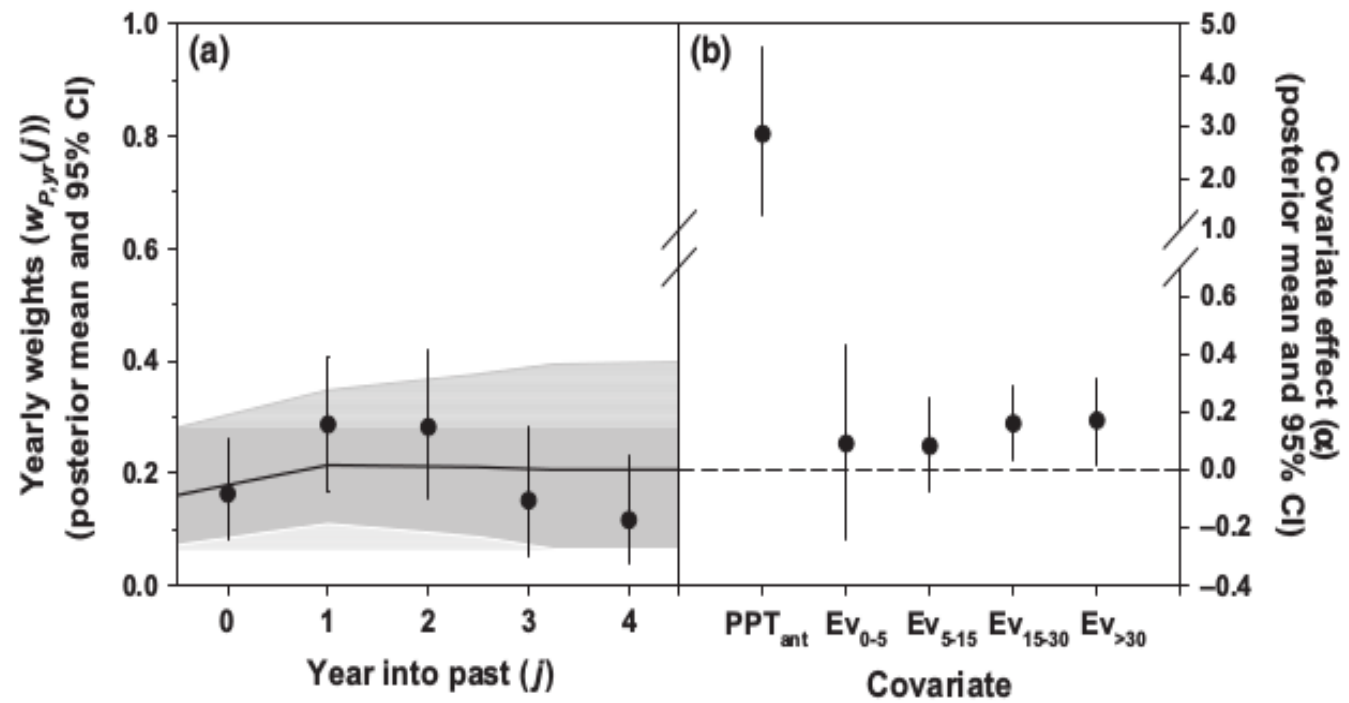
- Nutrient addition alleviates limitation.
- Haying, grazing and fire reduce/remove litter legacies (but also confound).
- ...?

Stochastic Antecedent Modelling



Stochastic Antecedent Modelling



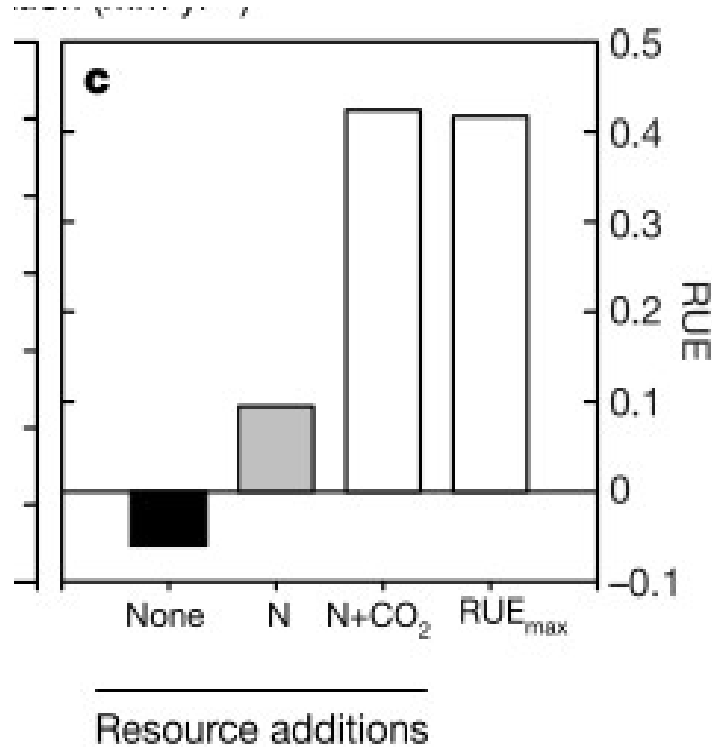


So what do we do with this

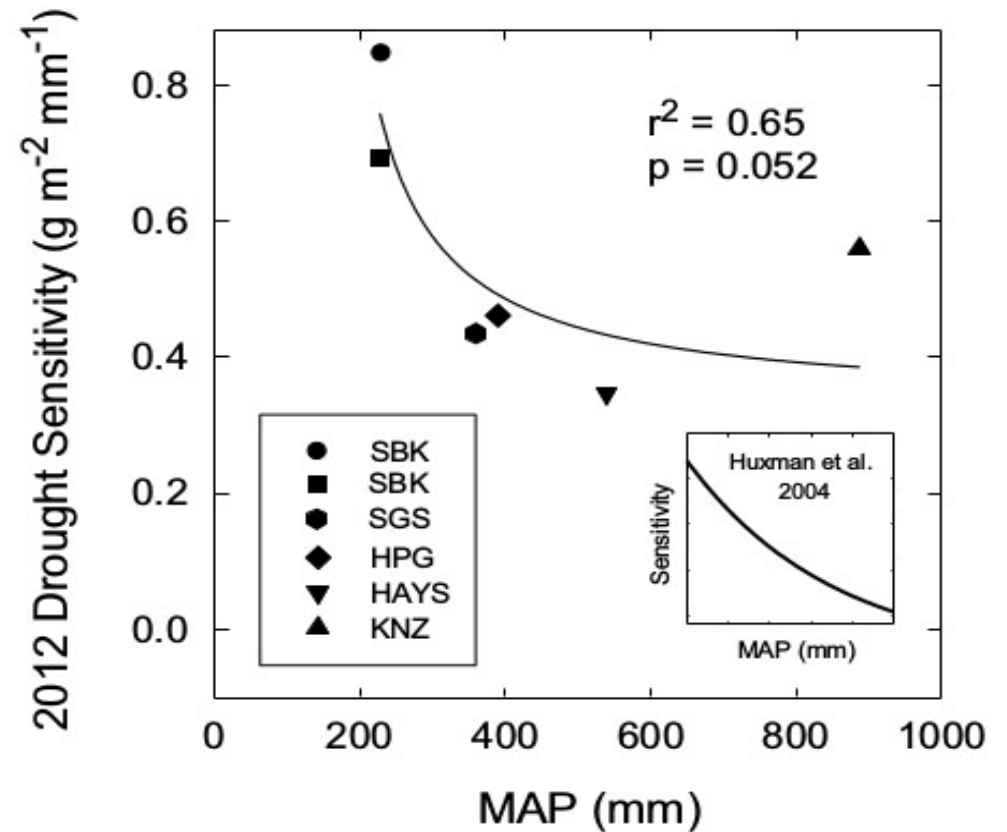
- Fertilization should lead to a closer coupling of ANPP and precipitation.
- ...

Framework of multiple limitation →

Greater sensitivity of arid sites to drought.



Huxman et al 2004



Knapp et al 2015

Data!

- LTER experiments
- Global dataset of 82 resource addition experiments assembled by Kim La Pierre et al.
- Global dataset of ANPP and precipitation records (>10 yrs) assembled by Lau Gherardi and Osvaldo Sala.
- The Nutrient Network (after a few more years)

Brainstorming!!

- Mechanisms of legacies, ecological memory in your system.
- What things other than ANPP do you think are interesting in these approaches? - Community composition?
- Experimental manipulation → Differences in memory/feedback → insight into biotic buffering mechanisms.
- What about places that are not grasslands?

References

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- Sala, O.E., Gherardi, L.A., Reichmann, L., Jobbágy, E., and Peters, D. (2012). Legacies of precipitation fluctuations on primary production: theory and data synthesis. *Philosophical Transactions of the Royal Society of London B: Biological Sciences* 367, 3135–3144.
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- Reichmann, L.G., and Sala, O.E. (2014). Differential sensitivities of grassland structural components to changes in precipitation mediate productivity response in a desert ecosystem. *Funct Ecol* 28, 1292–1298.