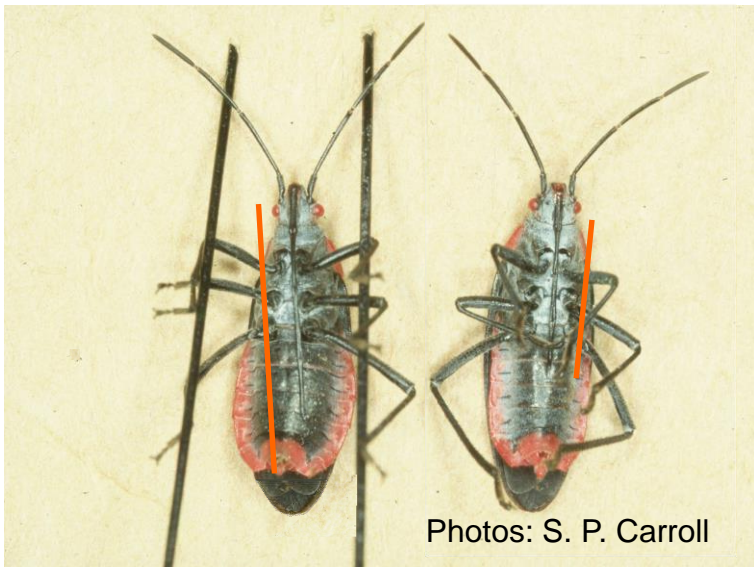




Adaptation



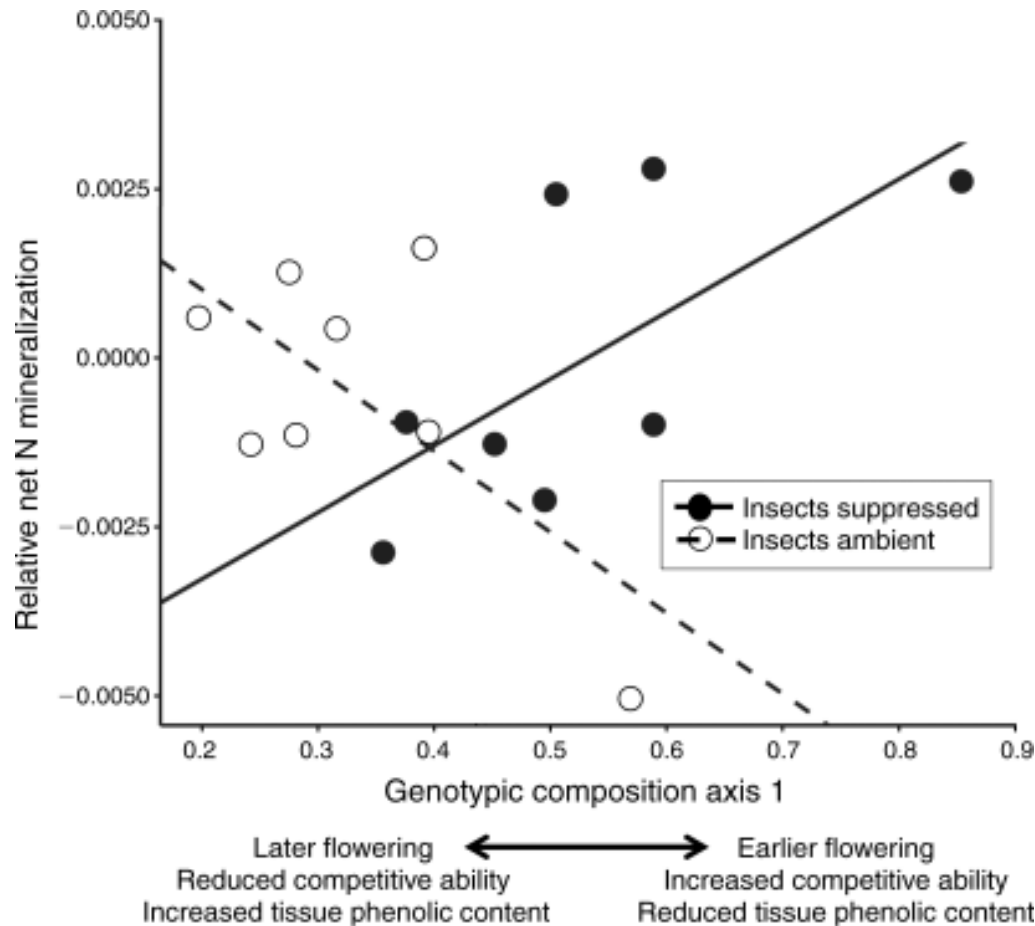
Evolution can be rapid...



Photos: S. P. Carroll

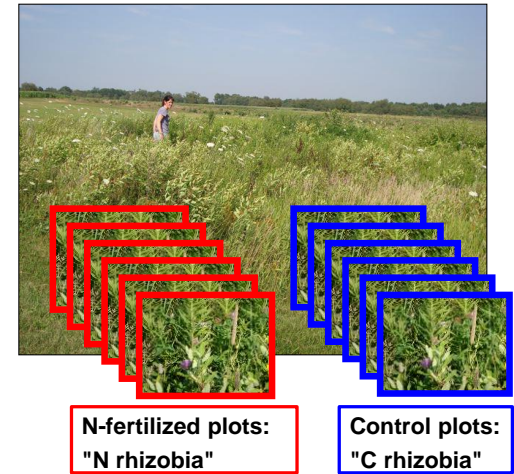
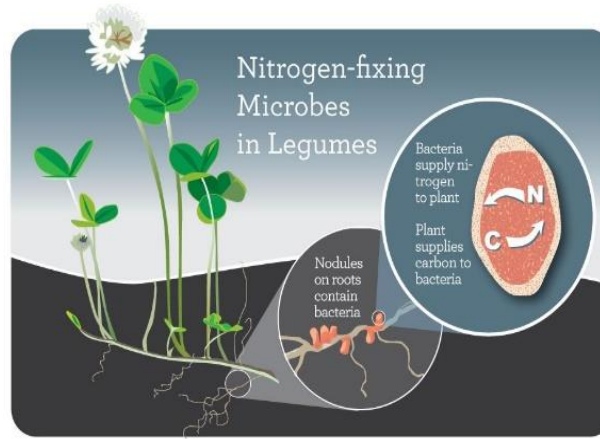


And rapid evolution can affect ecosystem functions.

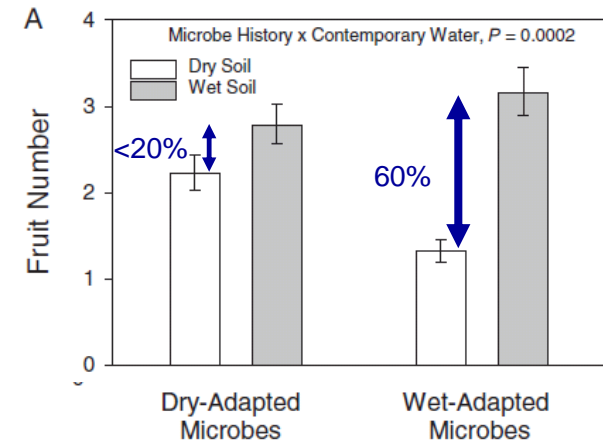


To what extent will rapid evolution stabilize ecosystem functions in the face of climate change?

A) Does the evolution of key microbes influence the resilience of ecosystem functions (e.g., N-fixation)?



B) Do diverse soil microbial communities "adapt" to drought in ways that influence the resilience of ecosystem functions?

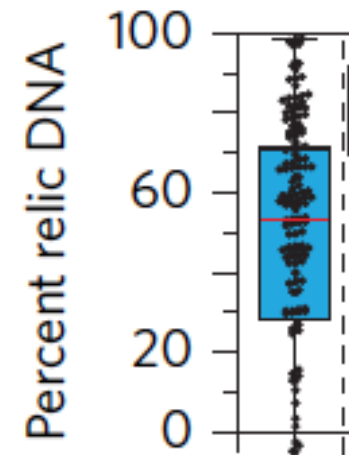
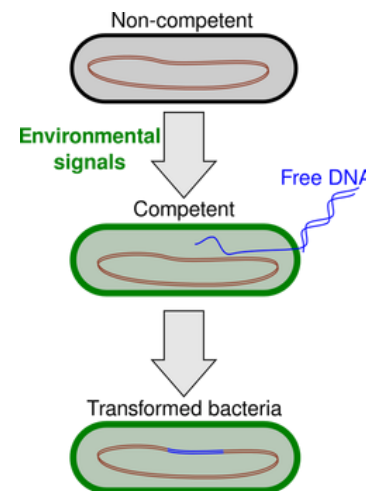


How do land use/management and climate change influence the mechanisms of evolution and constraints on evolution?

A) Are evolutionary responses more likely in less complex communities?



B) How do environmental conditions (nitrogen, drought) influence the frequency of horizontal gene transfer?



Many other opportunities...

Stabilizing

- Evolutionary rescue
- Coevolution

Destabilizing

- Evolution of herbicide resistance
- Evolution of pesticide resistance

What data/samples do we take now to prepare for future questions on how evolution → resilience?