Results of the SFI Working Group:
Coupled grassland and mammalian community dynamics over ecological and evolutionary timescales :: Sept 29 - Oct 02, 2015

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Our coupled grasslands working group at SFI decided to focus on three distinct working topics that will likely result in 5-6 research papers over the next 2-3 years. Our research topics span three key areas: 1) the dynamics of grassland woodland transitions in systems with rich herbivore assemblages, 2) the influence of grasslands on community dynamics throughout the Cenozoic, and 3) the ecological and evolutionary effects of C3 vs. C4-photosynthetic grasses on mammalian communities, with a particular emphasis on the origin and radiation of the genus *Theropithecus*.

<u>The specific goals of these projects include the following questions and aims:</u>

What are the effects of herbivores on grasslands on different time scales?
Define what are the abiotic determinants of open vs closed habitats.
Model the effect of fire and herbivores with climate as a background factor.
Infer the proportional contribution of fire and herbivore (and interactions between both) to open-closed dynamics.

What are the Macroevolutionary effects of grassland expansions?
Use data on fossil mammals (maybe starting with horses) to estimate shifts in diversification.
Separate forest vs open habitat lineages.
Use grasslands (general) and C4 expansion as a independent variable.

Are there fundamental differences in the dynamics of modern and past open and closed systems?
Use environmental data to reconstruct the landscape.
Use modern data to find interaction rules across trophic levels.
Reconstruct the paleontological food webs using probabilistic models.
Use generalized models to infer dynamics properties and extinction sequences.

The working group subunits that are separately focusing on these three key areas of research will reconvene for a followup working group in Dartmouth College in May. The manuscripts that result from these research topics will be published independently instead of a special issue, due primarily to the diversity of theoretical and empirical approaches that will be used, resulting in very different timescales over which the papers will likely be completed.