

Effects of Fire Frequency on Shaping Multiple Ecosystem Outcomes in Tallgrass Prairie



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Background Information

- Recovery of grasslands from fire is rapid, especially in Tallgrass Prairie (TGP) (Fig.1; hatched lines) but recovery depends on precipitation levels
- ↑ Precipitation × Frequent Fires = ↑ Plant Productivity
- ↓ Precipitation × Frequent Fires = ↓ Plant Productivity
- Effects of fire have been mainly studied in the context of just one ecosystem outcome at a time

Research Aim and Hypothesis

Aim: Assess the effects of fire return interval on shaping multiple ecosystem outcomes in TGP

Hypothesis: More frequent fires will lead to more successful ecosystem outcomes in wetter sites

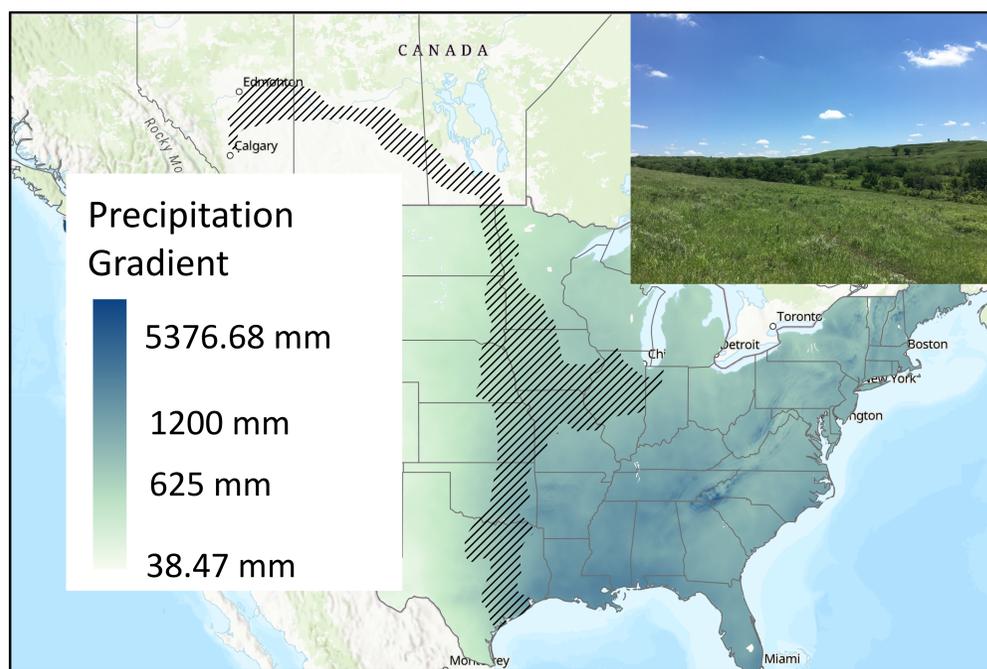


Figure 1. Map of North America with the TGP range hatched in black and the precipitation gradient. TGP receives on average between 625 and 1200 mm of precipitation a year.

Meta-Analysis Approach

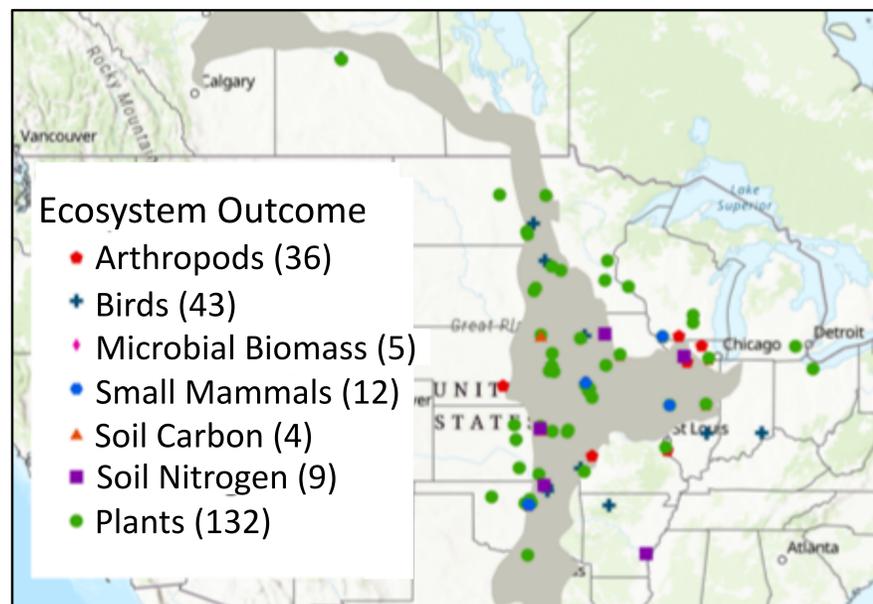
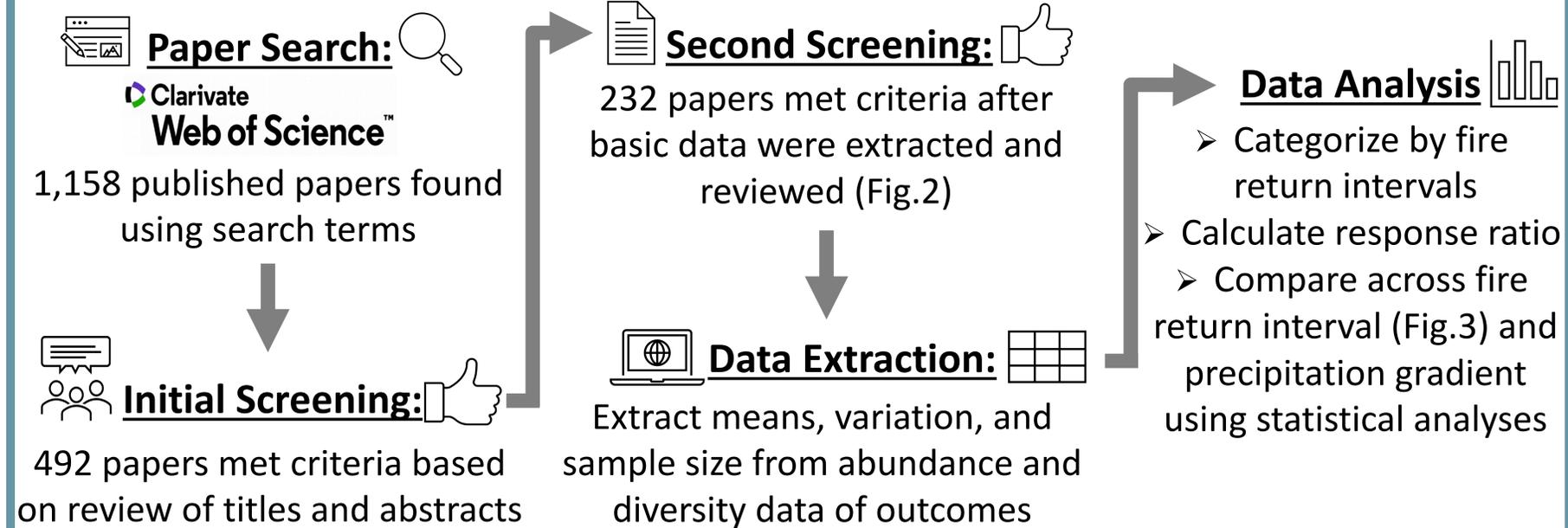


Figure 2. Map of North America with TGP in grey. Points represent a single ecosystem outcome in a study. Numbers represent number of papers that studied each outcome.

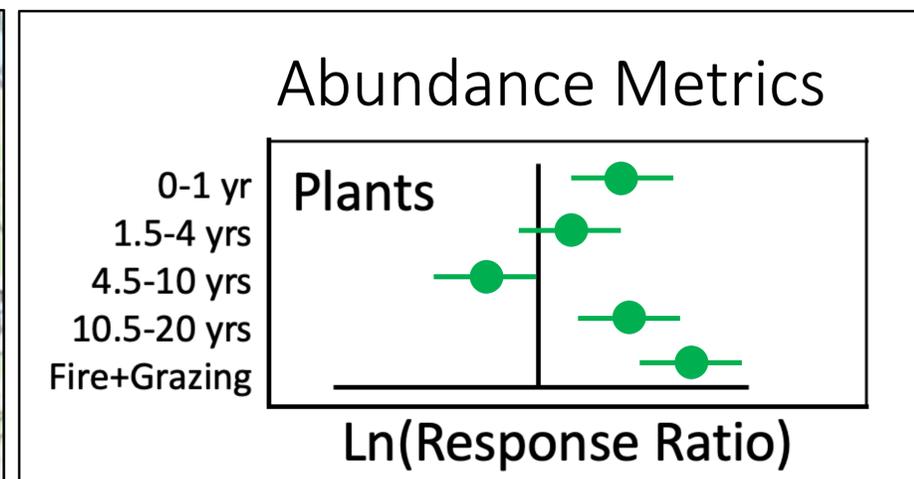


Figure 3. Example figure. The log of the response ratio will be graphed against fire return interval categories. Points to the left and right of the black line indicate a decrease or increase in abundance (e.g., biomass) to that fire return interval range, respectively.

Anticipated Outcomes

- Determine most effective fire return intervals across multiple ecosystem outcomes
- Make land management recommendations based on ecosystem outcomes of interest to land managers
 - Increased sustainability of important ecosystem outcomes in TGP