

How does flower production in tropical forests respond to climate change?

- The structure and function of tropical forests, comprised of a diversity of growth forms, are strongly driven by competition for light.
- However, disentangling the effects of light, temperature, and precipitation has been difficult, in part because quantifying clouds has been a challenge.
- New satellite data was used to quantify cloudiness, and the effects of light, temperature, and precipitation on flower production was investigated using long-term data from Barro Colorado Island, Panama.

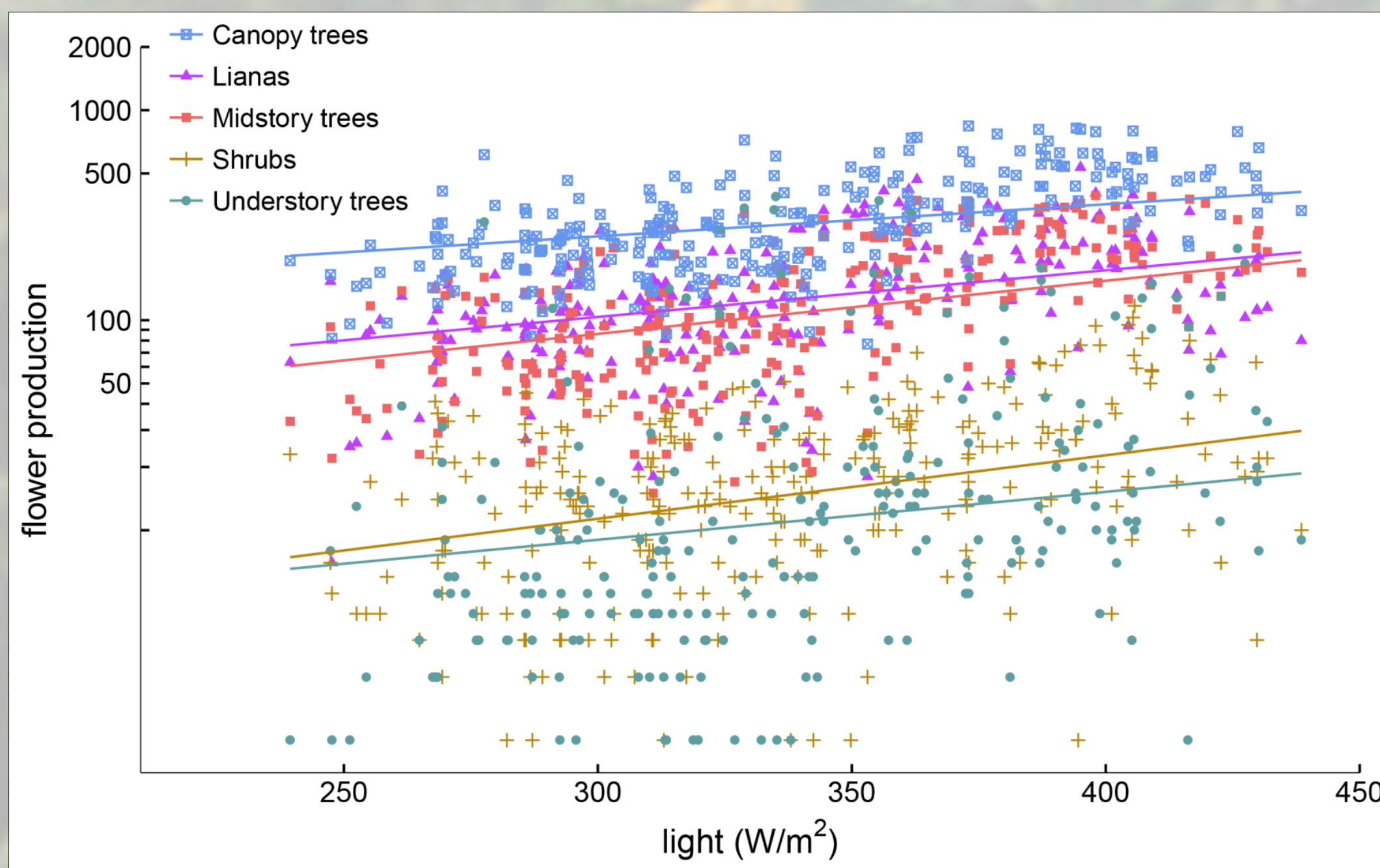


Figure 1. All growth forms except for vines responded positively to increases in light using linear regressions with autocorrelated errors. Canopy trees were marginally significant ($p < 0.06$) based on independent contrasts to test if the slope of each growth form was significantly different than zero.

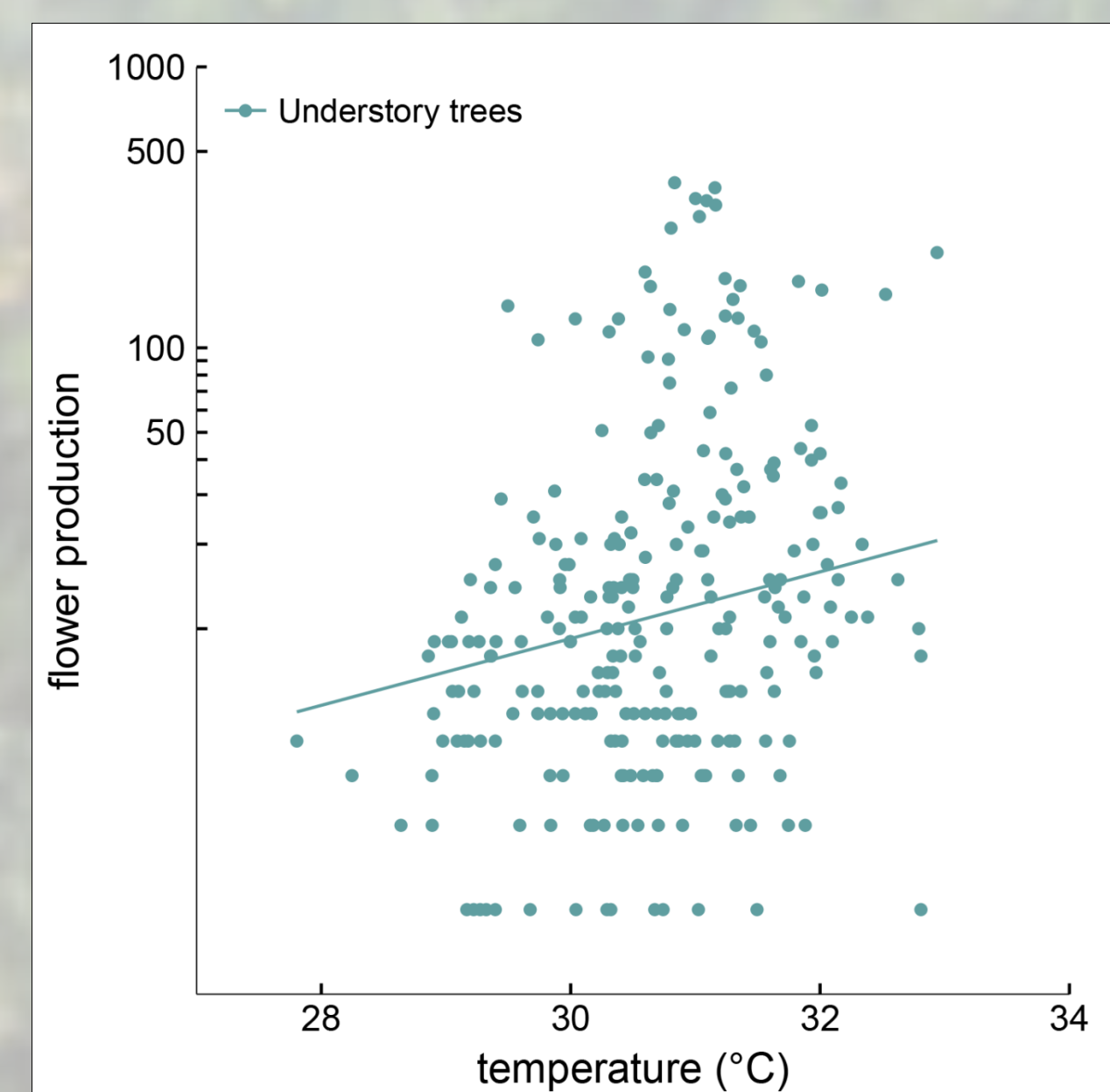


Figure 2. Understory treelets were positively affected by temperature and no other growth forms had a slope significantly different from zero in response to temperature or precipitation.

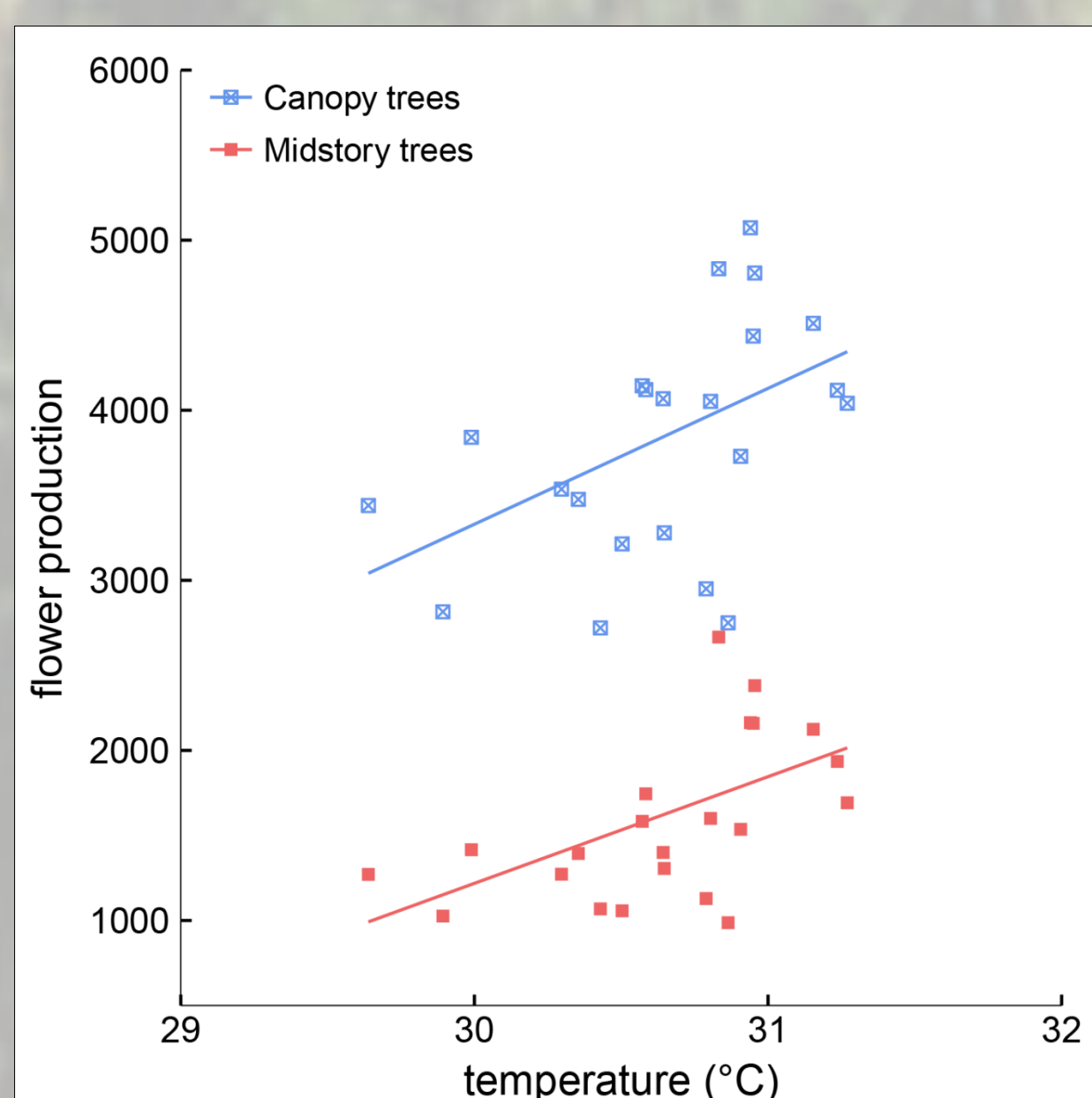


Figure 3. Only canopy and midstory trees responded significantly to year-to-year changes in temperature and no other growth forms responded to temperature or other climatic factors.

- The effect of clouds and light availability is only important seasonally, whereas temperature affects flower production across multiple timescales.
- Although higher latitudes are known to be more sensitive to temperature, this work shows that even small degrees of temperature change has an effect on tropical forests.