

MASTREE+: time-series of plant reproductive effort from six continents

Andrew Hacket-Pain¹, Jessie Foest¹ & members of the MAST-NET project

1. Department of Geography and Planning, School of Environmental Sciences, University of Liverpool. Andrew.Hacket-Pain@liverpool.ac.uk

Significant gaps remain in understanding how forest reproduction responds to environmental change, partly because measuring reproduction in trees requires observations over many years. Such datasets are rarely publicly available. Here we showcase MASTREE+, a new open-access dataset of reproductive time-series from across the globe. MASTREE+ can be used to address many questions including understanding variation in reproductive strategies, changes in resource allocation to reproduction over space, time and between species, and the response of seed and fruit production to environmental change.

MASTREE+

- >70,000 georeferenced observations of annual reproductive output
- Comprise >6,000 population-level time-series
- >1,000 species, mainly trees, all major vegetated biomes
- Mean time-series length = 12 years, with hundreds of multi-decade time-series
- Data compiled from the literature and unpublished datasets, all harmonized and validated

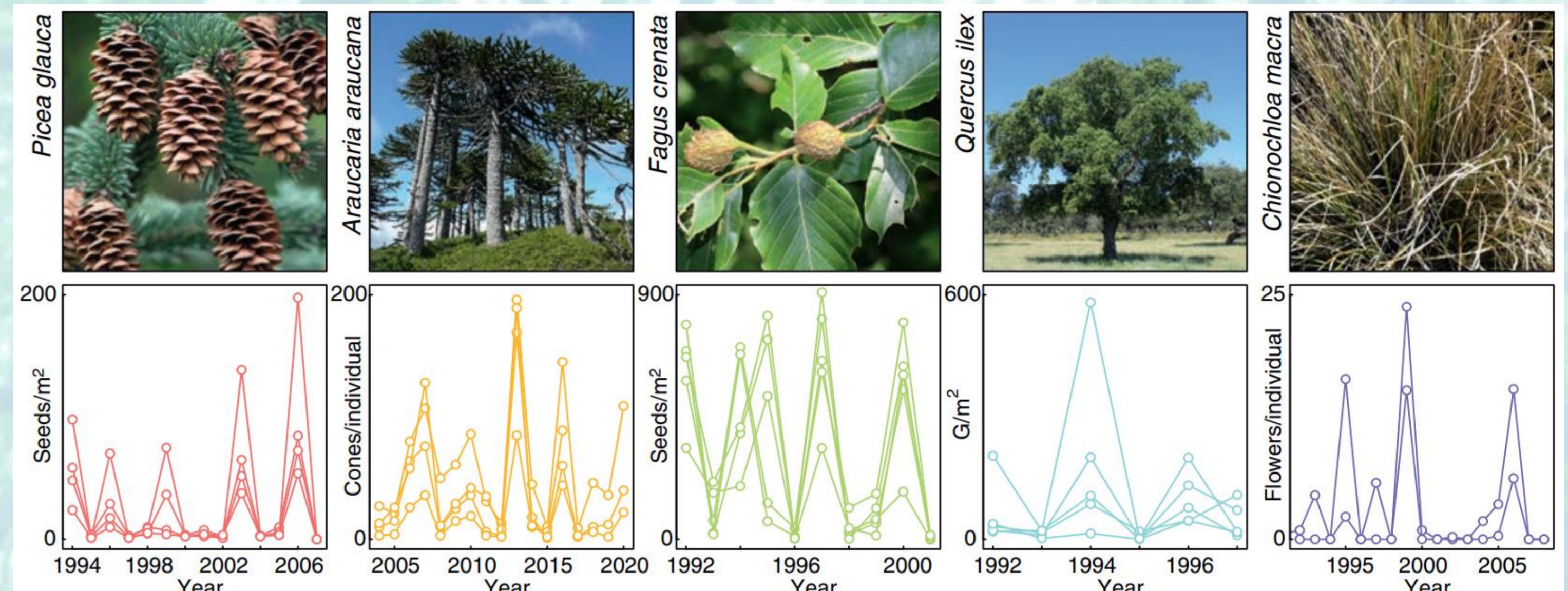


Figure 1. What does the data look like? Example data from MASTREE+. For each species, local population-level time-series are plotted, illustrating the range of spatiotemporal variation in reproduction. Note that for many species, reproductive failure is the norm, and large reproductive events occur only occasionally

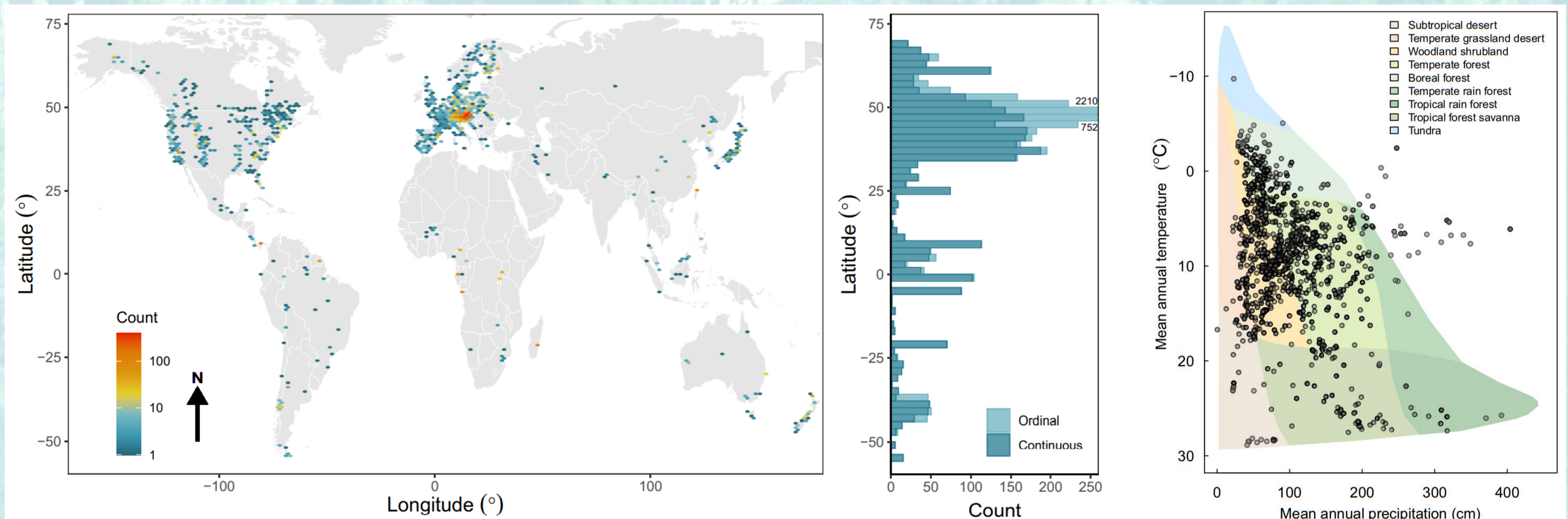


Figure 2. Where does the data come from? MASTREE+ includes >6,000 population-level time-series of annual reproductive effort from six continents. Data is sourced from six continents, with a bias to temperate regions in the northern hemisphere. Tropical data includes fewer locations, but many more species.

All data can be explored and freely downloaded using an online tool:

<https://mastreeplus.shinyapps.io/mastreeplus/>

Outlook and future research

- The response of long-lived plant reproduction to environmental change
- The role of plant reproduction as a driver of ecosystem dynamics, including forest demographics, C and N fluxes, wider cascading effects of resource pulses on food webs
- The ecology and evolution of plant reproductive strategies

All data is open access

Do you have data that could be added to v2.0?
Please get in touch!