

TreeCo: Neotropical Tree Communities database

The Neotropical Tree Communities database (TreeCo) is a project that aims to compile, store and synthesize the existing knowledge on the structure and diversity of neotropical tree communities (both forests and shrublands). The overarching goal of TreeCo is to support studies on the patterns and processes shaping neotropical communities and how these communities respond to human-induced impacts and global change. Another goal is to contribute to the academic formation of grad students, particularly in South America.

The TreeCo database was established in 2014, with an initial focus on the Atlantic Forest (Argentina, Brazil, Paraguay). In a joint effort of technicians and grad students, the database expanded to include data on other extra-Amazonian domains in eastern South America, namely the Cerrado, Caatinga and Pantanal. Due to the wide variety of studies compiled, sampling protocols are quite variable. But, the majority of the surveys available relate to single-census studies conducted with ~1ha (range: 0.1-40 ha) and diameter at breast height ≥ 5 or 10cm. Surveys were conducted a wide range of climatic and edaphic conditions and forest types span from lowland rain forests to dry deciduous forests, including cloud, swamp, and white-sand forests, as well as savanna and high-altitude rocky shrublands. TreeCo contains data on secondary, disturbed and old-growth vegetations. Most surveys were published after 1995, but some date back to the 50s and 60s.

Currently, TreeCo contains over 2000 surveys with descriptions of the sampling methods and the main descriptors of the studied communities (e.g. observed density, biomass, species richness and diversity). It also has meta-data associated with each survey, including climate, soil, landscape metrics, and forest disturbance level. TreeCo contains data on species functional traits as well. TreeCo is currently led by Dr. Renato Lima at the Naturalis Biodiversity Center, the Netherlands, in association with Profs. Paulo Inácio Prado and Alexandre A. Oliveira at the University of São Paulo, where the data and metadata are stored. The implementation and maintenance of the database were supported by the São Paulo Research Foundation (FAPESP) and the European Union's Research and Innovation program.

Project phases

- Phase 1: systematic review of studies containing quantitative tree community surveys
- Phase 2: scanning studies to get the site information, surveys methods and main results
- Phase 3: validating site geographical coordinates, soil type and fragment size
- Phase 4: obtaining environmental information for each site (e.g. precipitation and temperature) based on verified survey coordinates
- Phase 5: extracting values of species abundances and basal area per site (mainly surveys with >0.1 ha and $DBH > 5$ or 10cm)
- Phase 6: validating species names and updating species identifications based on specimens vouchers
- Phase 7: obtaining information on tree species functional traits (e.g. seed size, wood density, etc) from the taxonomic literature
- Phase 8: establish partnerships and conduct new inventories (FUTURE)
- Phase 9: make database available online (FUTURE)

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