At each sampling location, 1,000 – 2,000 ml of soil were removed from the first 0-15 cm of soil with a small trowel and stored in a sealable plastic bag. Because the coarse-textured nature of atoll soils makes traditional coring difficult, we followed the water method for sample volume (Page-Dumroese et al., 2010), which determines volume by lining the sample hole with a thin plastic layer and recording the volume of water needed to fill the hole to the reference surface. Hardpan depth at each site was measured with a soil probe. After collection, soil samples were passed through a 2 mm sieve, air-dried, and then the <2 mm fraction was shipped to a laboratory for carbon analysis.

The samples collected in 2016 were analyzed for both organic carbon and total carbon percentage. Although the 2019 samples were analyzed for total carbon only, the organic carbon fraction for the 2019 samples were estimated based on the relationship between total carbon and organic carbon derived from the 2016 samples and samples collected at another atoll in the tropical central Pacific.

Wood was collected at 18 different locations. As the location at Palmyra was not expected to influence the variation of wood density, the sites were not stratified by islet. Instead, they were collected opportunistically to coincide with soil sampling locations. A single woody branch approximately 10 cm in length was removed from each tree and cut into discs at each sampling location.

To standardize sampling in a remote location with limited facilities, woody density was measured (disc diameter and width) at the fiber saturation point (Diana Smith, 1954) (discs were submerged for 24 hours at ambient pressure) and the anhydrous state (measured and weighed). We could not estimate fiber saturation point and volumetric shrinkage in the field. These values were calculated as the mean of values reported for 50 tropical tree species by the Inter-American Institute for Cooperation on Agriculture (IICA) (Cordero, 1971), except for *P. grandis*, for which genera-specific values were reported. The ranges for both values were narrow, and final BWD estimates were insensitive to variation within reported ranges. With these coefficients, we calculated BWD for native trees at Palmyra according to Vieilledent et al. 2018 making them comparable to CIRAD values. BWD values for Palmyra natives fell within the range reported for congeners in CIRAD. These values are reported in Longley-Wood et al. 2022.

About this Data Package

The zip file has all the necessary files for spatial analysis of this data. This means all shapefiles to identify the exact locations of the samples.

Additionally, the .csv files has all the detailed information about the samples (eg vegetation community type, islet name, etc.)