

Characterizing the Root Structure of Red Mangrove Communities within Biscayne Bay Coastal Wetlands



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BACKGROUND

Sea level rise threatens the health of red mangrove ecosystems. Mangrove root and soil characteristics can be used to predict the ecosystem's response to increased water levels. However, research in this area is not well defined.

This project serves as a starting point for studying mangrove root and soil structures. In particular, this study analyzes root and soil content for different red mangrove communities near the L-31E canal system.

METHODS

1. Soil cores were collected from dwarf mangrove sites and tree islands
2. Live dry root content and organic matter content were calculated for each core.
3. Results were assessed across tree sites, soil types, and soil core depth

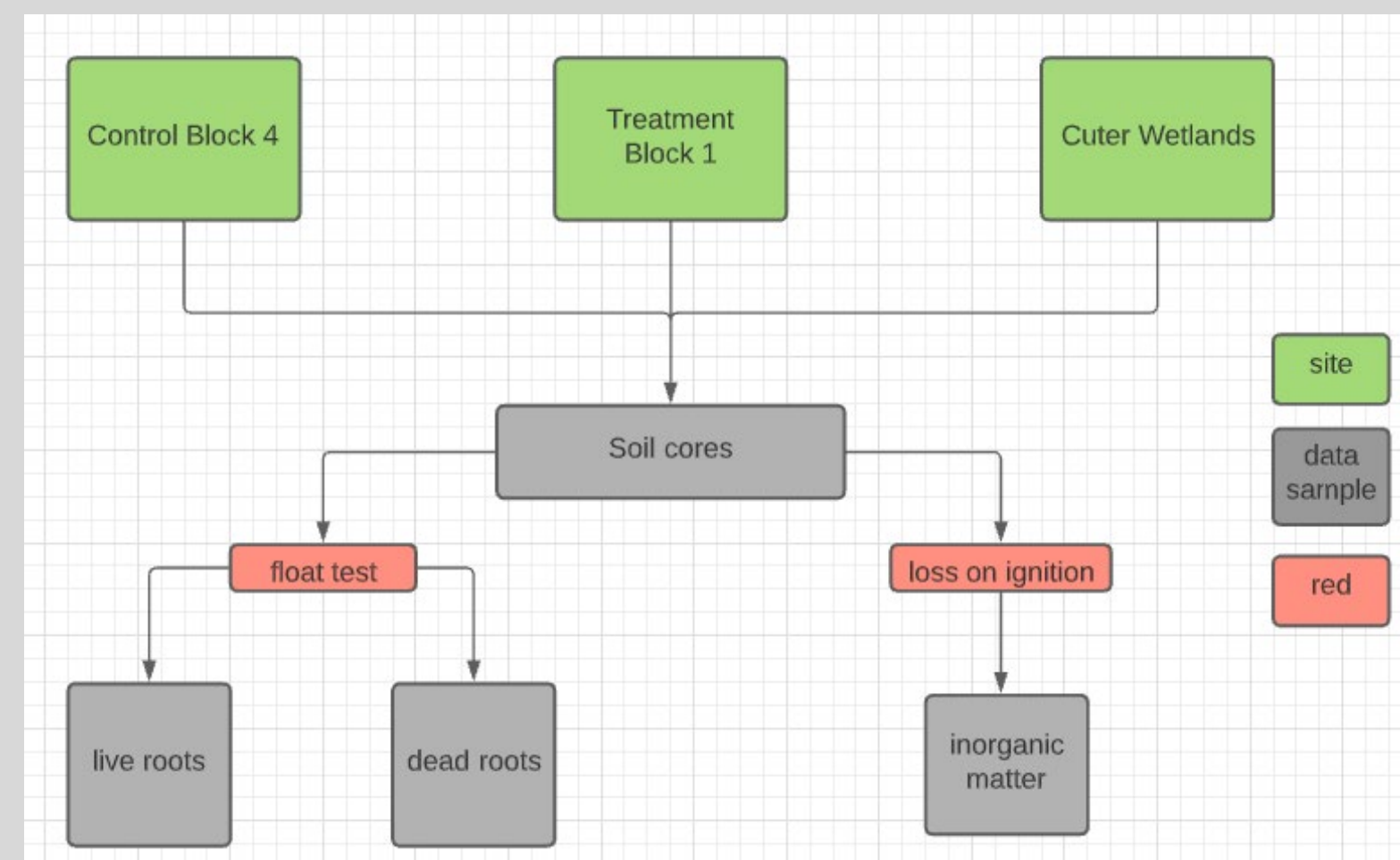


Figure 1: Flow chart of sample collection and analysis

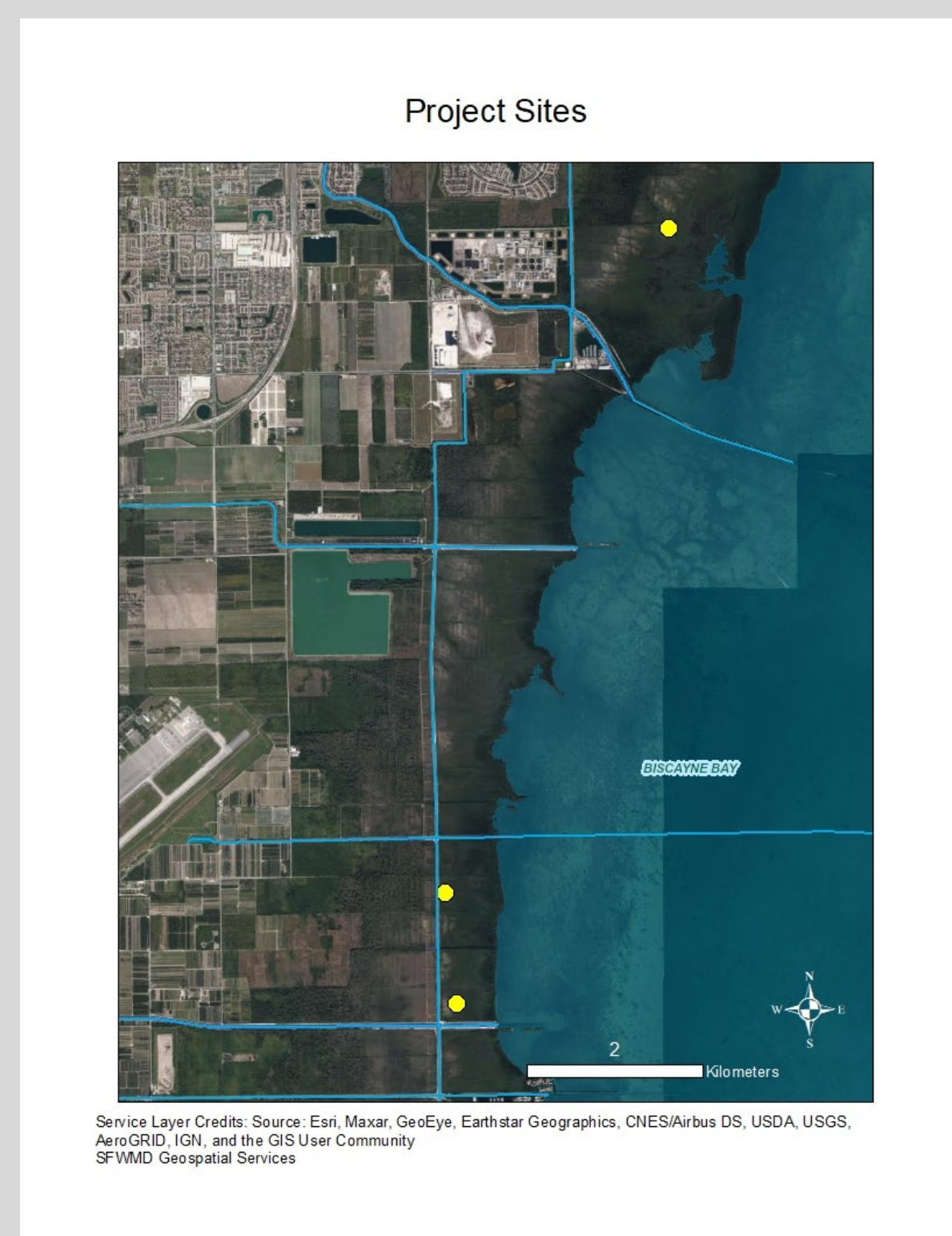


Figure 2: Map of three mangrove sites where soil cores were taken. Yellow dots indicate sites, blue lines represent the L-31E canal system.

In soils of red mangrove communities, live root content trends are independent of organic matter trends.

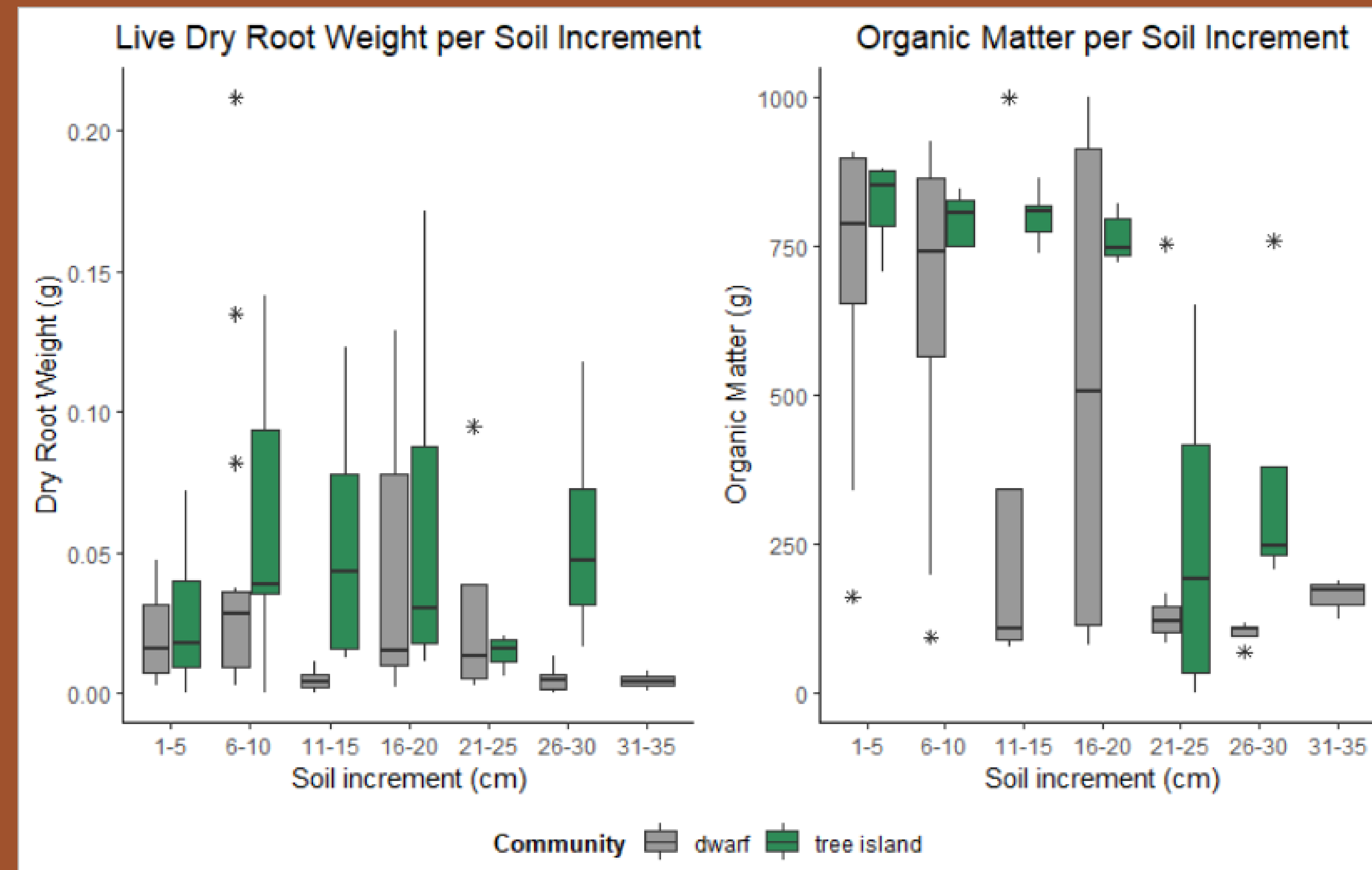


Figure 3: Boxplots depicting the live dry root weight and organic matter content per soil increment. Outliers are denoted by black stars. While a general decrease in organic matter was seen at greater depths, no trend was seen in the dry root matter content.



Figure 4: Soil cores taken from a dwarf (left) and tree island site (right). Soil composition and measurements are shown next to each core.

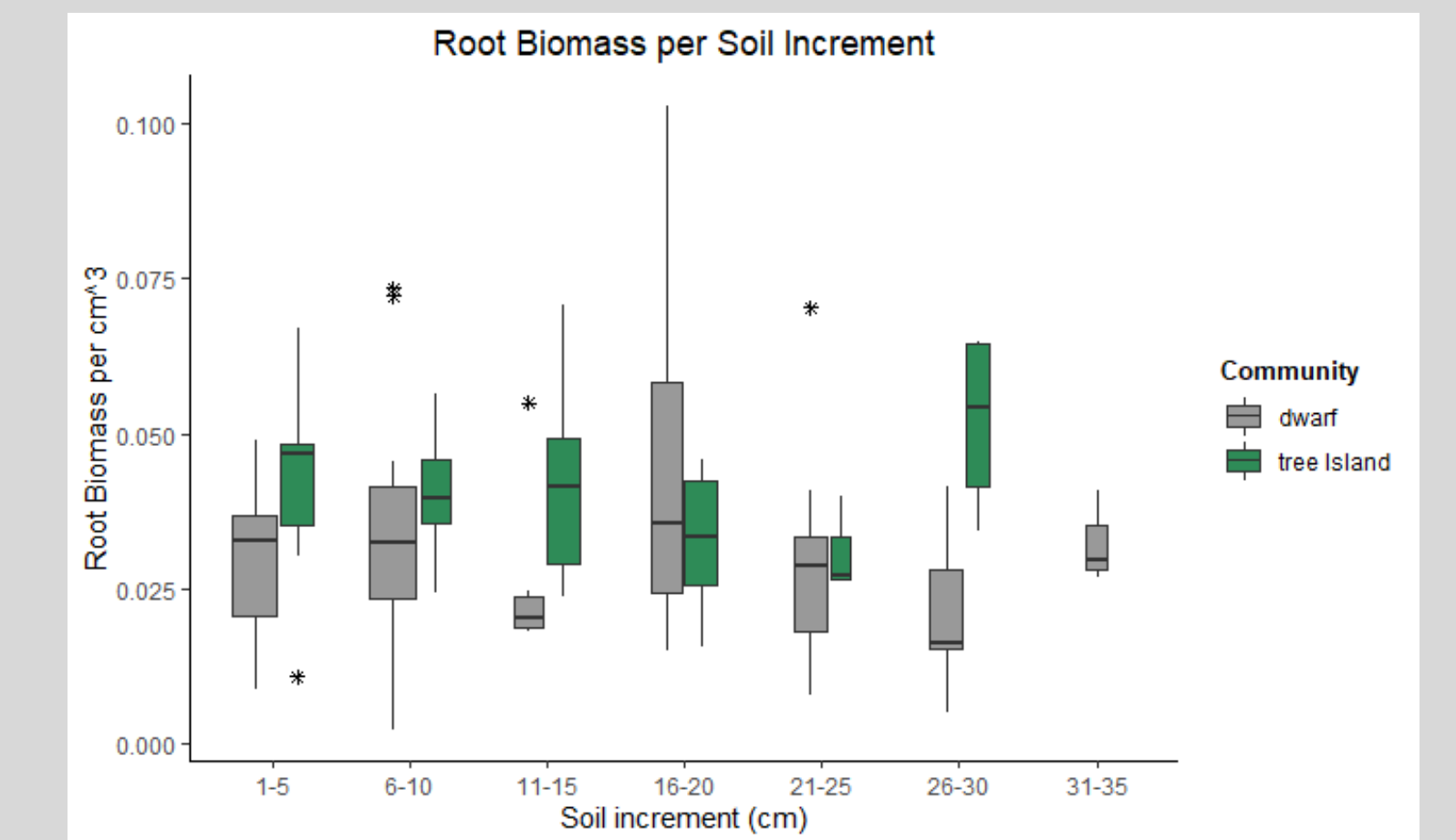


Figure 5: Root biomass volume for each red mangrove community per soil increment depth. Outliers are shown with black stars. Total root biomass was similar across all communities and increments.

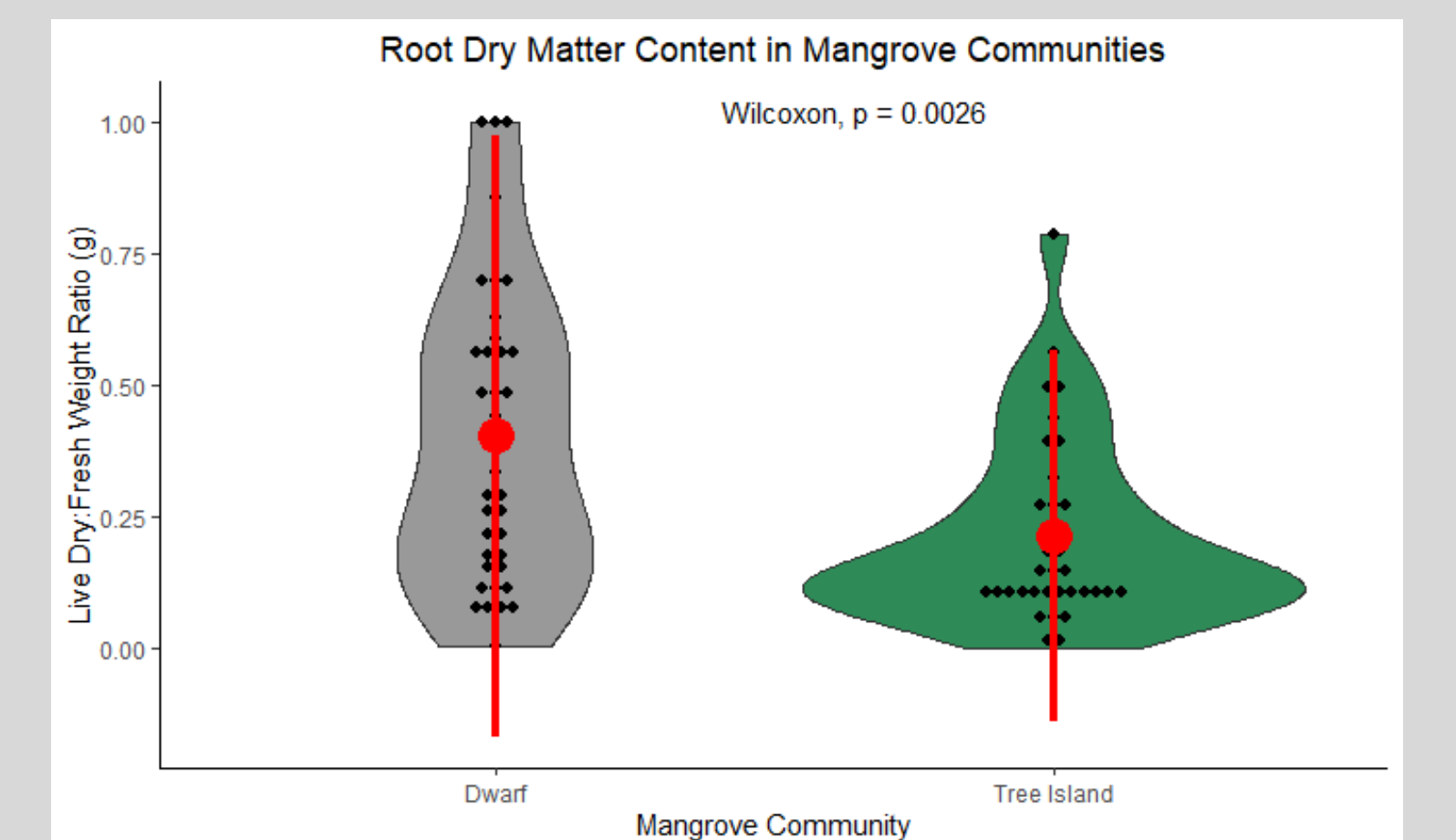


Figure 6: Root dry matter content of dwarf and tree island red mangrove communities. Ratio of live root dry weight to wet weight was used to measure root dry matter content. The red line represents the interquartile range. The red point signifies the mean, while the black points signify individual points. Higher root dry matter content is typical for more conservative plants.

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