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Keywords

- mangroves
- Mozambique
- SRTM
- biomass
- Landsat

Index Terms

- Biogeosciences: Ecosystems, structure and dynamics
- Biogeosciences: Plant ecology
- Biogeosciences: Remote sensing
- Biogeosciences: Wetlands

Abstract

Landscape-scale extent, height, biomass, and carbon estimation of Mozambique's mangrove forests with Landsat ETM+ and Shuttle Radar Topography Mission elevation data

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Mangroves are salt tolerant plants that grow within the intertidal zone along tropical and subtropical coasts. They are important barriers for mitigating coastal disturbances, provide habitat for over 1300 animal species and are one of the most productive ecosystems. Mozambique's mangroves extend along 2700 km and cover one of the largest areas in Africa. The purpose of this study was to determine the countrywide mean tree height spatial distribution and biomass of Mozambique's mangrove forests using Landsat ETM+ and Shuttle Radar Topography Mission (SRTM) data. The SRTM data were calibrated using the Landsat derived land-cover map and height calibration equations. Stand-specific canopy height-biomass allometric equations developed from field measurements and published height-biomass equations were used to calculate aboveground biomass of the mangrove forests on a landscape scale. The results showed that mangrove forests covered a total of 2909 km^2 in Mozambique, a 27% smaller area than previously estimated. The SRTM calibration indicated that average tree heights changed with geographical settings. Even though the coast of Mozambique spans across 16 degrees latitude, we did not find a relationship between latitude and biomass. These results confirm that geological setting has a greater influence than latitude alone on mangrove production. The total mangrove dry aboveground biomass in Mozambique was 23.6 million tons and the total carbon was 11.8 million tons.

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