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Estimation of Net Primary Production in the Transition Forest of South East Amazon

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Abstract

The calculation of Net Primary Production (NPP) in tropical forests is of great importance for the estimation of the global carbon budget. While wet lowland forests are studied intensively little information is available on Amazon- Savannah transition forests despite their great ecological importance. We want to fill this gap with the investigation of non flooded (dry) and temporary flooded forest stands in the transition zone in South East Amazonia in Tocantins State, Brazil.

On an area of 2.25 ha 1227 and 1102 trees from dry and flooded forest respectively were included in the study. NPP was calculated from sum of increment of surviving trees, increment of recruits and quantity of fine litter fall. The increment of trees (>6.3 DBH) was calculated by measuring height and diameter at two inventories with a time lag of five years. From this data we calculated the wood volume using allometric equations and converted this to biomass with specific wood densities. The litter fall was measured during this period monthly with 30 litter traps,

The biomass increment in dry forest areas was 70% higher comparing to flooded areas. In both study areas the biggest part of total aboveground NPP was represent by litter fall and was 4.73 in the dry and 4.02 Mg C ha⁻¹ year⁻¹ in the flooded forest. The total aboveground NPP in the dry transition forest is calculated to 8.64 Mg C ha⁻¹ year⁻¹ what is 47% higher compared to the flooded forest type. The quantity of NPP in dry transition forest from South East Amazon is comparable with the NPP in Central Amazon forests. The conservation of transition forest is important for regional and national forestry policies and total carbon budget.

Keywords: Carbon budget, net Primary Production, Transition Amazon Forest , Tropical forest