

Variation of air temperature on conserved and impacted mangroves: preliminary results on the Southern coast of São Paulo State, Brazil

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Abstract

Mangrove ecosystems have suffered significant changes, by natural and anthropogenic pressures. These changes alter the vegetation cover and consequently the microclimate. The air temperature influences the vegetation growth and development. The aim of the current study is to analyze the variation of air temperature in two areas of Cananéia-Iguape Coastal System, located on the Southern coast of São Paulo State (Brazil): an impacted mangrove forest; and a conserved mangrove forest in a protected area. Data have been obtained from a meteorological tower since 2008 in the impacted area and since April 2011 in the conserved area. In both areas have been used sensors CS215 - Campbell Scientific, recorded every 10 minutes during three periods: from 02 to 26 May; from 28 June to 22 July; and from 02 to 26 August 2011. In both areas, data were obtained at 2m high, below the canopy. Data were tested using Pearson linear correlation, with a significance level of 5%, obtaining positive correlations with $r = 0.865$. The impacted mangrove forest showed extreme values, with the maximum absolute temperature of 33.0 °C at 3 p.m., whereas in the conserved mangrove forest the maximum absolute temperature was 30.2 °C, both registered in August. On the other hand, the minimum temperature in the impacted area recorded was 6.5 °C, and in the conserved area it was 11.3°C, both registered in June. The results indicated the amplitudes were lower in the conserved environment, showing less variation in air temperature. During the three monitored periods, in conserved area the values were 12.5 °C, 18.5 °C and 24.4 °C, while in the impacted mangrove were 14.8 °C, 18.9 °C and 26.7 °C, to May, June-July and August, respectively. The conclusion was the state of mangrove canopy conservation contributes to reduce the thermal amplitude, minimizing energy losses in microclimate. This monitoring has been done to provide mid-term information in order to improve the understanding of the mangrove forest microclimate and finally to assist this (sub)tropical wetland conservation.

Keywords

conservation status, canopy, microclimate data, monitoring