

ABSTRACT

Pinus caribaea forests are replacing indigenous forests in the catchment areas of the reservoirs feeding Kingston, Jamaica. Certain aspects of the consequences on streamflow and sedimentation are determined by comparing two small basins (<50 ha.), in the headwaters of the Wagwater River at Mt. Airy, covered with each forest type. The physical characteristics are described, the main differences lying in area, altitude, relative relief, and channel characteristics.

The water balance for each basin is determined for the year Nov. 1977 to Oct. 1978, and the loss accredited to evapotranspiration. Losses for the basins range between 53 and 57%, and do not vary significantly between the basins. Monthly patterns are considered to determine temporal variation in water use by the forests. The accuracy of the method is discussed, and comparisons are made with potential evapotranspiration rates. The main difference between the forest type lies in direct evaporation from the soil surface, potentially greater under the pines because of lower humidity levels due to a less complete canopy cover.

Storm runoff characteristics are similar. Peak flow rates are slightly higher from the pine covered basin and occur more rapidly after storm commencement, than in the basin

(ii)

covered with Lower Montane Rainforest, suggesting a higher flood risk. The implications of this are discussed.

Slope wash is significantly greater under the Lower Montane Rainforest, measured as $2.25 \text{ cm}^3/\text{cm}/\text{yr}$. Under the pines, it is $0.35 \text{ cm}^3/\text{cm}/\text{yr}$. Stream load is greater from the channel in the pine forest suggesting erosion rates of $13.88 \text{ tonnes}/\text{km}^3/\text{yr}$. Siltation of the streams occurs mainly from the contribution played by forestry roads.

Further needs for research in this field in Jamaica are identified and recommended.