



Use of simple hydrological response functions in hillslope transects containing forest and wetland patches in the Eastern Cape Province, South Africa.

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Sustaining forest plantations in areas zoned as marginal for afforestation in the northern Eastern Cape Province in South Africa, requires quantification of the sources and pathways of streamflow components. This is particularly important since cultivated forests have been identified as a Streamflow Reduction Activity (SFRA) by managers of South African water resources. In addition, afforestation may not occur within predefined distances of wetlands. The afforested basin in the northern Eastern Cape Province is thus a mosaic of forested, wetland and grassland zones. In order to assess the impact of afforestation and to develop guidelines for future afforestation an experimental catchment has been established within the basin and the land use, soils, and topography of the basin have been carefully mapped. The mapped distribution of the forested, wetland and grassland zones has been used to define their positions on the hillslopes. Based on the hydrological processes defined from observations in the experimental catchment (1.2km²), simple hillslope response functions are derived and used to illustrate the importance to the hydrological response of the location of the wetlands, (whether plateau wetland, hillslope wetland or valley bottom wetland); the impact of the water uptake in the forested zones and the sources of overland flow, near surface soil water flow and groundwater flow in simulations of the forested Mooi river basin (307km²).