

Methodology for estimation of the change in the reserve of the Berg catchment, Western Cape, South Africa

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Water is considered being the most important natural resource worldwide. In South Africa a big concern is the management of water resources especially since water resources in South Africa are scarce. The 'reserve' policy tries to make a balance between the demand on water and a healthy ecosystem. This policy needs detailed environmental, hydrological, hydrogeological and ecological studies to determine this equilibrium between the demand, quantity and quality of water.

The study area, the Berg catchment, Western Cape, underwent many changes in the last years; a dam was built on the river creating a new ecological system behind it; and non-native hill slope vegetation upstream of the dam was cut and replaced by native vegetation. It is thought that evapotranspiration will reduce and recharge be increased due to this change in landuse. The catchment is characterized by a sand stone fractured aquifer; the fractures affect the groundwater recharge of the aquifer and have influence on both groundwater and surface water in the catchment.

Developing a comprehensive methodology with remote sensing input and distributed hydrological modeling to determine the quantitative aspects of the 'reserve' is the main goal of this study. Moreover, we analyzed the effect of land use on the hydrological functioning of the catchment. Hence, a time series of land use maps was created as a basis for further hydrological modeling of the change. Mapping of the lineaments in the catchment and applying it in groundwater modeling of the catchment is one of the other aspects of this study.

Key words: Berg catchment, reserve, hydrological modeling, lineaments.