

Climate change vulnerability index for South African aquifers

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Abstract

South Africa is viewed as a water-stressed country with an average annual rainfall of 500 mm and any climatic change could have adverse impacts on water resources of the country. The potential impacts of climate change on water resources and surface hydrology for Africa and Southern Africa have received considerable attention from hydrologists during the past decade. Very little research has been conducted on the future impact of climate change on groundwater resources in South Africa. Climate change can affect groundwater levels, recharge and groundwater contribution to baseflow. To assess these impacts a climate change vulnerability index was developed. This vulnerability-index method is known as the DART index. The parameters considered in the DART method are as follows: depth to water-level change, aquifer type (storativity), recharge and transmissivity. The DART index is used as a regional screening tool to identify areas that could experience possible changes in their groundwater resources as a result of climate change. The current DART index does not account for adaptation and migration occurrences.

Keywords: groundwater, climate change, vulnerability index, South Africa, DART