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On the Importance of Small Mountain Wetland Systems for Water and Carbon Cycles in the Ukhahlamba-Drakensberg Reserve, South Africa.

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In the light of increasing population pressure and the predicted increase in climate variability in both South Africa and Lesotho, questions arise regarding the sustainability and the degree to which the montane wetland systems are responsible for flow regulation and biogeochemical cycling. Thus an understanding of the hydrological, geomorphic, sediment, carbon and nutrient exchanges is fundamental.

Wetland systems in the Drakensberg region have previously been identified as mesotrophic in that they are partially dependant on rainwater and yet are also being fed to varying degrees by seepage through mineral matter. Many of these systems are ephemeral in nature and dry at least to the point of a mud-pan during the winter months.

It is highly likely that this unique feature of drying and rewetting has had a profound impact on soil redox chemistry. We are determined to present first data of net greenhouse gas dynamics. Furthermore springwater will be measured for carbon (POC, DOC) and nitrate. Soil carbon distribution within the wetlands and related isotope data, adjacent mineral soils and eroded sites will be presented.

To this end the occurrence and morphology was mapped, and the water quality, soil chemistry and organic matter content were investigated. Preliminary investigations show that the water is fairly acidic (pH 3.9 to 6.0), of high quality (mean conductivity 6,8 μS cm-1) and has very low concentrations of dissolved salts. Variations within the systems, however, attest to their complexity. The location as also their morphology attests to the significant role of the local geology in controlling the character of these systems.