

Satellite inspired hydrology in an uncertain future: a H SAF and HEPEX workshop



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Type: **Oral presentation**

Assessment of Snowmelt Run-Off Contribution into the Senqu River

This study attempts to assess the amount of water contribution from snowmelt water equivalent into Senqu River of Lesotho. Cloud free MODIS (terra/Aqua) MOD09A1 images were downloaded for the winter snow-packing period (April-July) and the melting seasons (August –September) for the years 2013-2017. The snow cover areas were mapped using the three conditions, which are Normalised Difference Snow Index (NDSI) with a thresholds reflectance values $\geq 40\%$. Band-4 value $> 10\%$ whilst Band -2 value $> 11\%$ were used to map snow cover areas. Snow cover area mapping results indicated that as much as 90% spatial cover can be achieved as shown for 27 July 2016. SRTM DEM was used to extract the catchment characteristics. The river discharges were modelled using Snowmelt Runoff Model (SRM). It was calibrated using dataset from time-period 2000 and validated by 2013-2014 whilst 2015-2017 data-set was used to substantiate the model performance. The performances was assessed through percentage volume difference (DV) of 56% and coefficient of determination (R^2) of 93%. The model results showed that as much as $9.247 \times 10^6 \text{ m}^3$ of runoff was contribution by snowmelt water equivalent during the year 2016 snowmelt season.

Which session would you like to present in?

1. Remote sensing, hydrological modelling and data assimilation

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