



## **Monitoring Climate-Induced Fluctuations in Hydropower Output with Satellite Data: Preliminary Evidence from Malawi**

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Rainfall extremes including droughts and floods can curtail hydroelectricity generation and undermine electricity supply security. This is particularly relevant where - such as in 23 countries of Sub-Saharan Africa - hydropower represents at least half of the installed capacity, and little back-up options are currently available. Here, we assess the ability of TOPEX/Poseidon water level height satellite measurements and of VIIRS Black Marble nighttime light radiance to monitor hydropower output and detect declines in generation during drought events at a monthly scale across a country and its provinces. We refer to the case of Malawi for the period between 2012 and 2018. Field-gauged runoff data for the Shire river and the time-series of effective generation at individual facilities retrieved from EGENCO - the utility responsible for generation - is used to validate the approach. Our results show that with a proper modelling framework, publicly available satellite data can effectively detect climate-induced power output variations.