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The skill of ECMWF long range Forecasting System to drive impact models for health and hydrology in Africa

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As the quality of numerical weather prediction over the monthly to seasonal leadtimes steadily improves there is an increasing motivation to apply these fruitfully to the impacts sectors of health, water, energy and agriculture. Despite these improvements, the accuracy of fields such as temperature and precipitation that are required to drive sectoral models can still be poor. This is true globally, but particularly so in Africa, the region of focus in the present study. In the last year ECMWF has been particularly active through EU research founded projects in demonstrating the capability of its longer range forecasting system to drive impact modeling systems in this region. A first assessment on the consequences of the documented errors in ECMWF forecasting system is therefore presented here looking at two different application fields which we found particularly critical for Africa - vector-born diseases prevention and hydrological monitoring.

A new malaria community model (VECTRI) has been developed at ICTP and tested for the 3 target regions participating in the QWECI project. The impacts on the mean malaria climate is assessed using the newly realized seasonal forecasting system (Sys4) with the dismissed system 3 (Sys3) which had the same model cycle of the up-to-date ECMWF re-analysis product (ERA-Interim). The predictive skill of Sys4 to be employed for malaria monitoring and forecast are also evaluated by aggregating the fields to country level. As a part of the DEWFORA projects, ECMWF is also developing a system for drought monitoring and forecasting over Africa whose main meteorological input is precipitation. Similarly to what is done for the VECTRI model, the skill of seasonal forecasts of precipitation is, in this application, translated into the capability of predicting drought while ERA-Interim is used in monitoring. On a monitoring level, the near real-time update of ERA-Interim could compensate the lack of observations in the regions. However, ERA-Interim suffers from biases and drifts that limit its application for drought monitoring purposes in some regions.