GPM for Hydropower Reservoir Management in Africa

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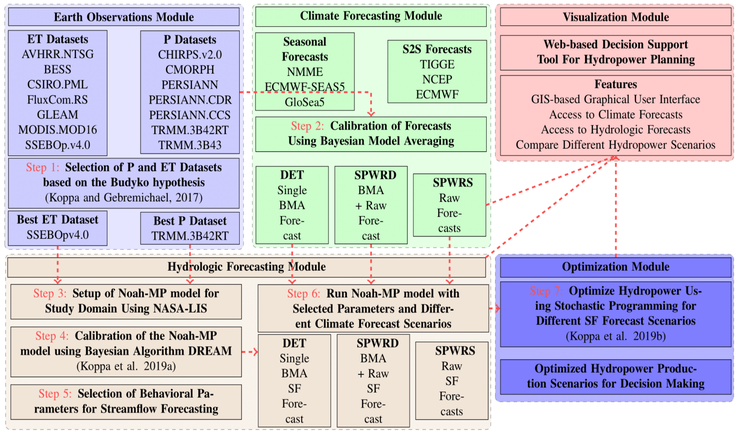
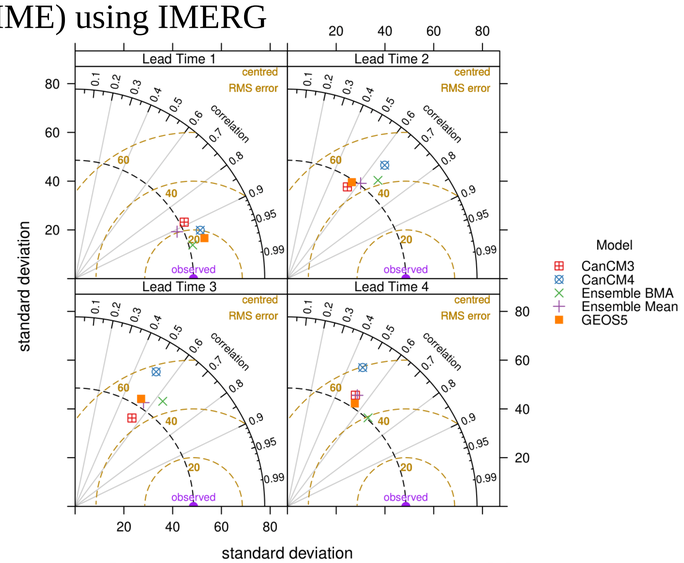
A New Decision Support System (DSS) for Hydropower Reservoir Operation in Africa



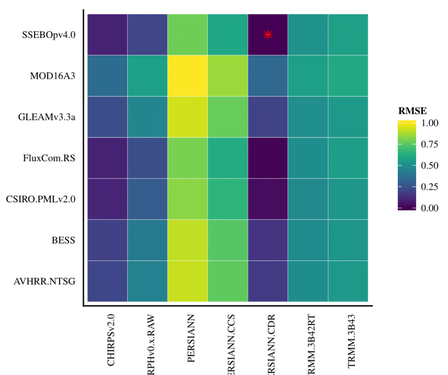
Test Case: Gilgel Gibe basin in Ethiopia

Step 1: Calibration of Seasonal Rainfall Forecasts (NMME) using IMERG



Bayesian model averaging + IMERG-Calibration = improved forecast

Step 2: LIS Model calibration using Satellite ET

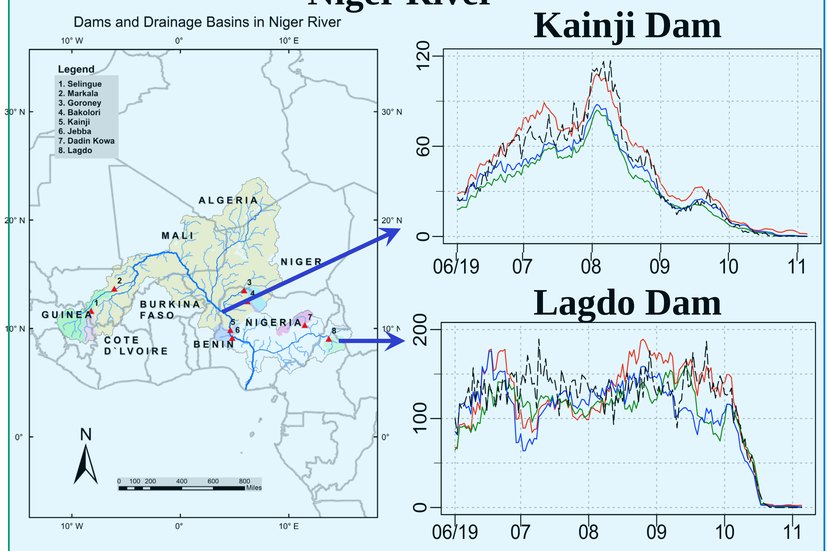


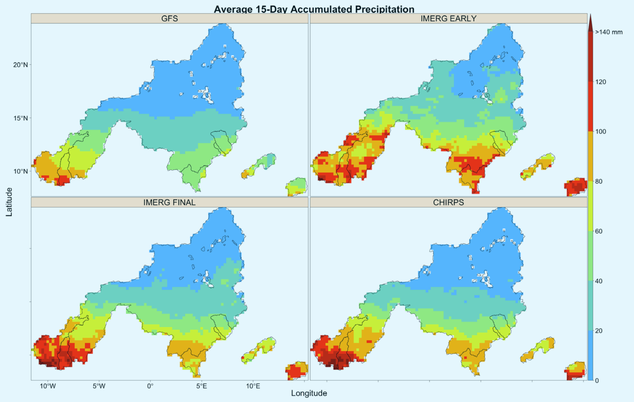
Budyko-hypothesis to choose the best satellite ET & P product

Satellite ET calibrated model performs well

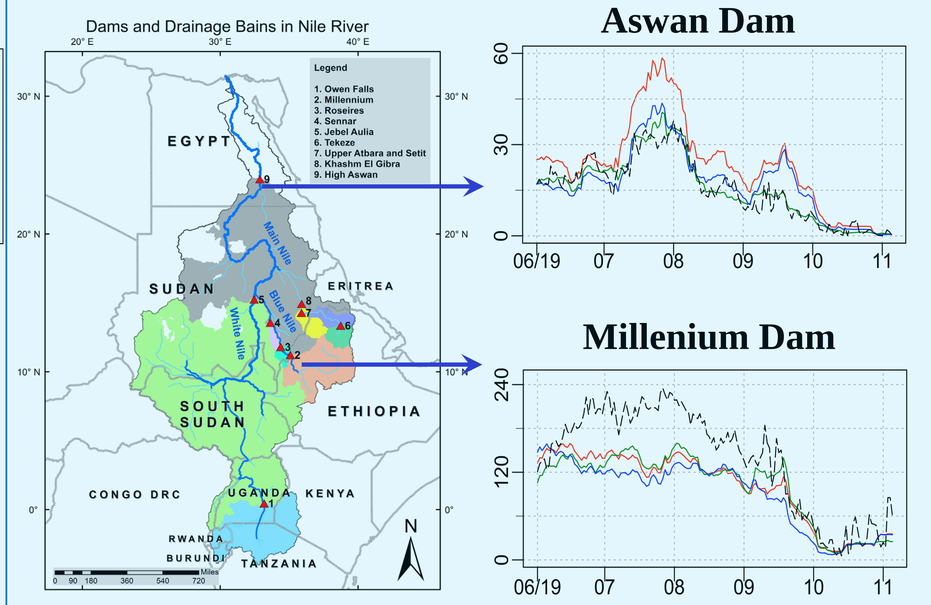
Extension to more African river basins over short time scales: Step 1: Evaluation of Medium-Range Forecasts (15-day Lead)

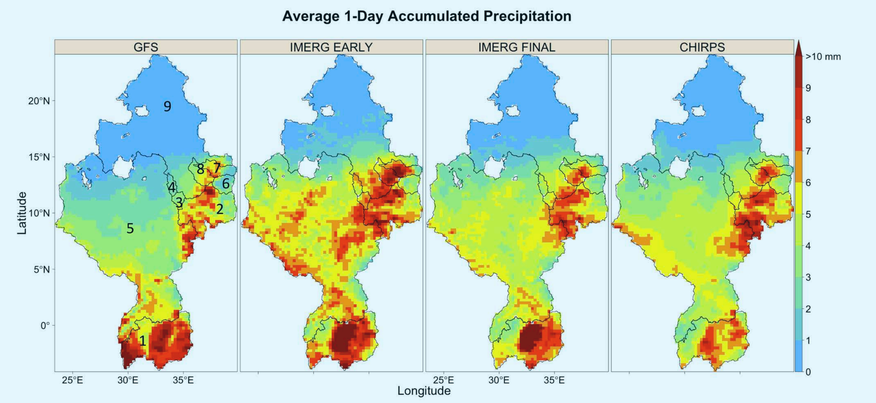
Niger River



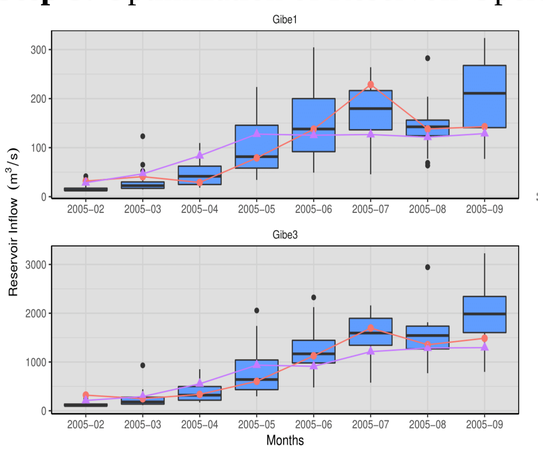


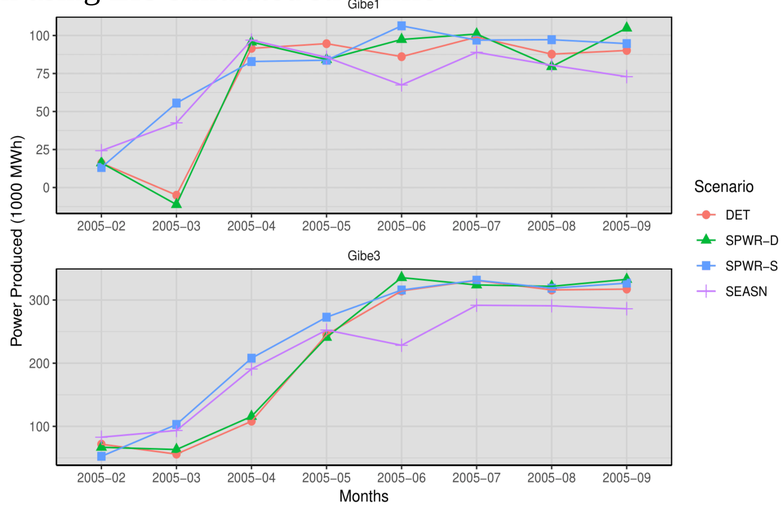
Nile River





Step 3: Optimization of Reservoir Operation using LIS simulated streamflow





Step 4: Validation

Gibe I: Actual power generated vs. Optimized power that could be generated with our DSS (million MWh)

Actual	DET	SPWR-D	SPWR-S	SEASN
0.54	0.68	0.71	0.76	0.54
% increase	28%	34%	43%	2%

Acknowledgement:
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