

Evaluation of SWAT+ for Evapotranspiration using RS derived Products:

An application for the Blue Nile Basin

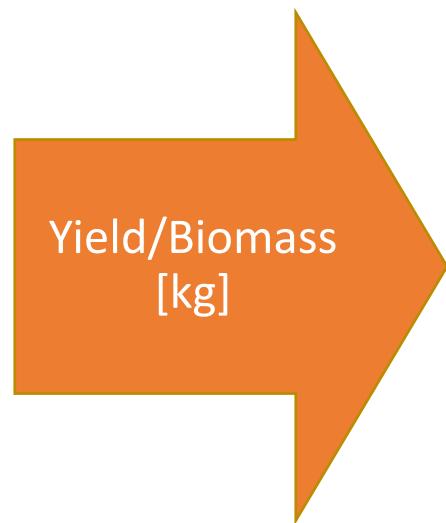
Preview

- The need for simulating ET using hydrological models
- Estimation of ET using SWAT+ by examining water balance (blue Nile case)
- Evaluation of ET SWAT+ results using RS derived products

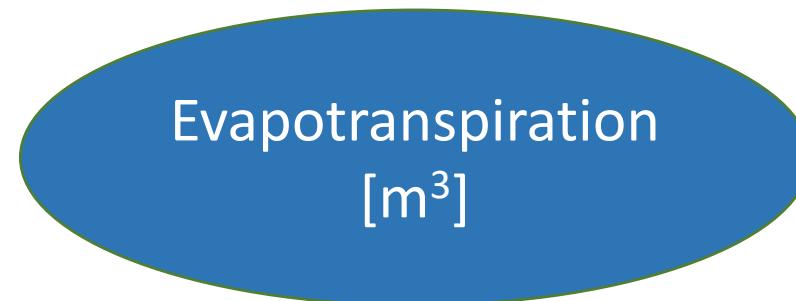
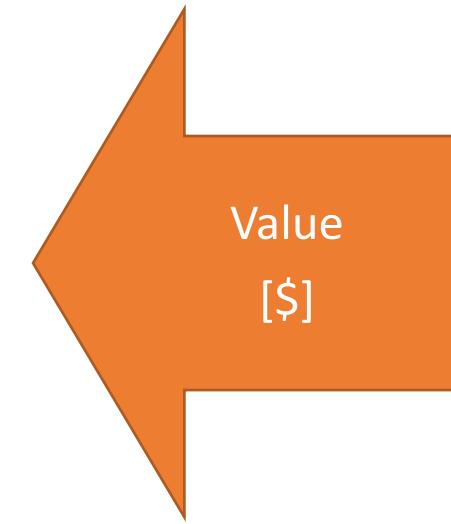
Water Productivity Estimations

important for basin performance on agriculture and water utilisation

Physical Quantity



Economic Value



Unit Water Consumed

Need for simulating ET

using hydrological models



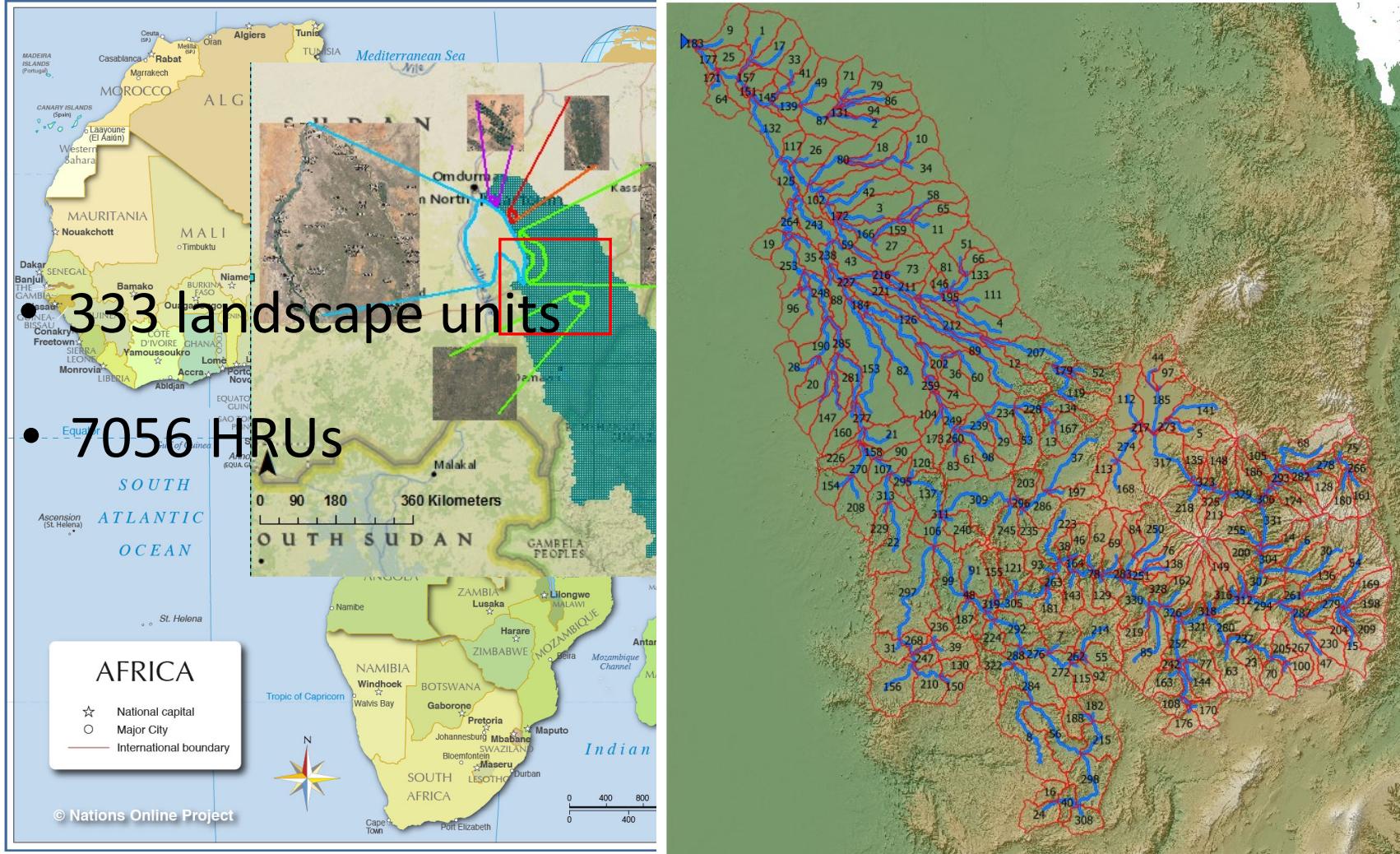
Scenario Analyses

Land use change

Climate change

Management options

Setting up of SWAT+ model using soft calibration technique



Setting up of SWAT+ model using soft calibration technique

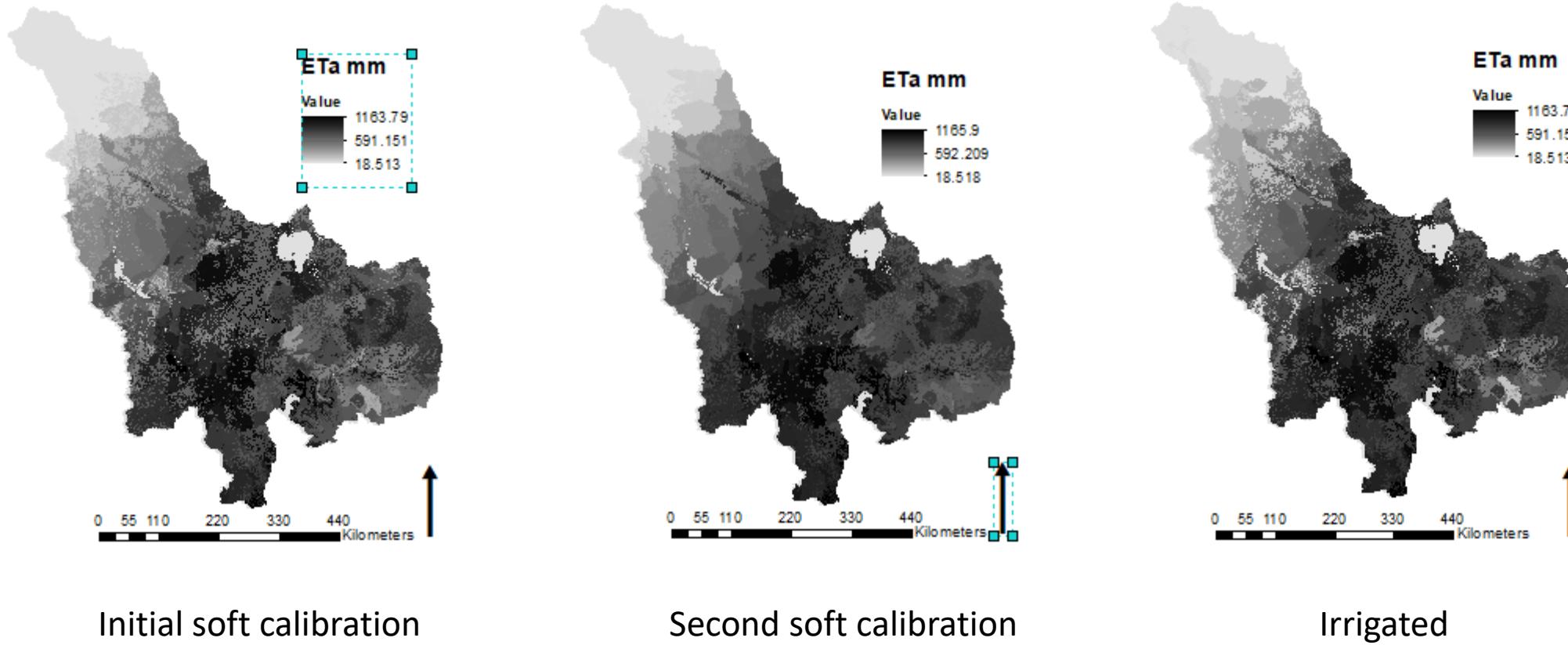
	ET	SR	LR	PC
Desired Ratios	0.60	0.07	0.07	0.26
Default Simulation	0.62	0.02	0.02	0.35
Soft Calibration	0.61	0.06	0.02	0.31

Estimation of ET using SWAT+ examining water balance

90% of P is ET

	ET	SR	LR	PC
Desired Ratios	0.60	0.07	0.07	0.26
Default Simulation	0.62	0.02	0.02	0.35
Soft Calibration 1	0.61	0.06	0.02	0.31
Desired Ratios	0.90	0.02	0.02	0.06
Soft Calibration 2	0.66	0.01	0.01	0.32

Estimation of ET using SWAT+ examining results

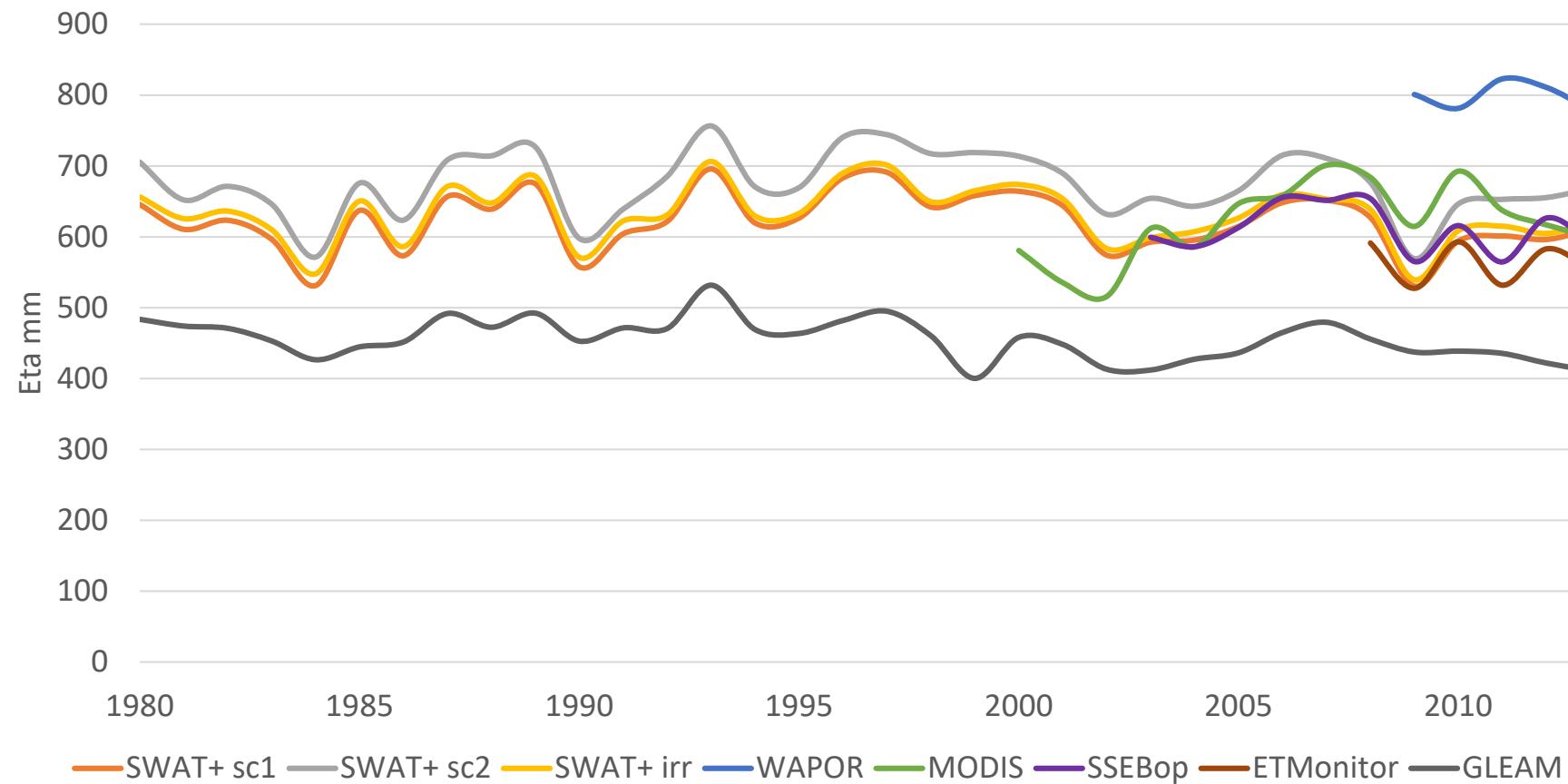


Remote Sensing ET Products

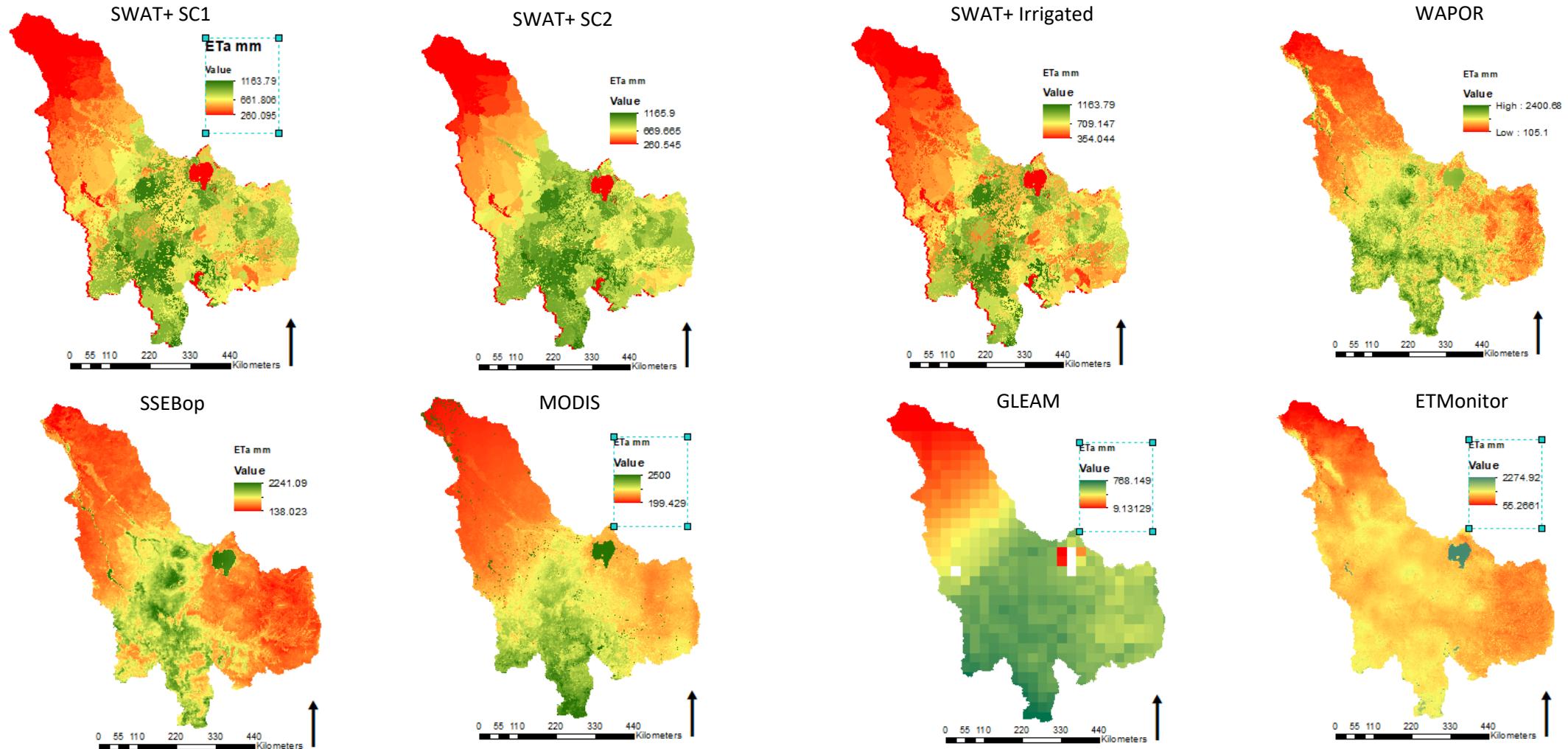
WAPOR, MODIS, SSEBop, ETMonitor, GLEAM

ET PRODUCT	Spatial Resolution	Temporal Resolution
WAPOR	250 m	Yearly
SSEBop	1 km	Monthly
MODIS ET (MOD16)	1 km	8-day
GLEAM	25 km	daily
ETMonitor	1 km	daily

Evaluation of SWAT+ ET Estimations using RS ET products – annual mean



Evaluation of SWAT+ ET Estimations using RS ET products – spatial distribution



Conclusions

Soft Calibration and Irrigation inputs to SWAT+
can improve ET estimation

RS products vary greatly in ET estimation
with SWAT+ estimations being more or less average

WAPOR ET product may be used to evaluate ET estimation
based on general water balance of basin

Next Steps

Hard calibration

based on evapotranspiration and biomass

Improve irrigation distribution
automate using WAPOR data

Look at separated evaporation and transpiration

And evaluate using RS products and different algorithms to separate ET