



# Experiences Gained Under WATPLAN FP7 Project

Prof Wim Bastiaanssen

with inputs from

Remco Dost

Caren Jarmain

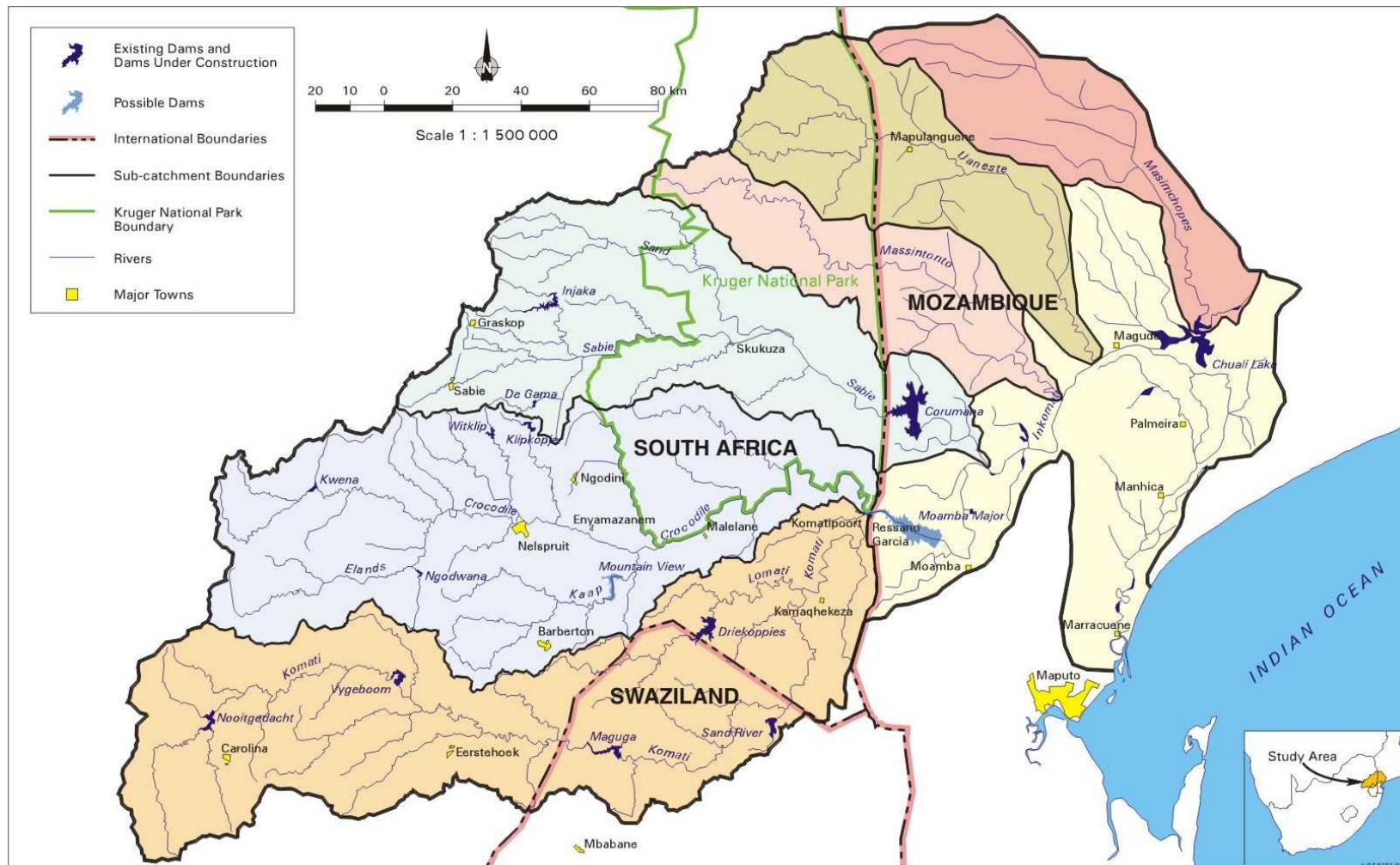
Fanie Fereira

eleaf.com





# Location of Incomati Basin



 CONSULTEC

## BKS ACRES

JOINT INKOMATI BASIN STUDY

## General Map of the Basin

**Fig 1**





# Operational Monitoring Product for Water

Objectives:

Provide an operational data service to water user groups in the Incomati Basin for acquiring a better knowledge on hydrological processes and renewable water resources to support their decision making process.

**WATPLAN**  
managing water use

**WATPLAN**

Operational Monitoring Product for Planning and Water Allocation in the International Incomati Basin (WATPLAN)

WATPLAN is a collaborative project under THEME [SPA.2010.3.2-03] of the European Community's Seventh Framework Program

This project focuses on water resources allocation, the identification of current water use, and high resolution monitoring of the

act / login

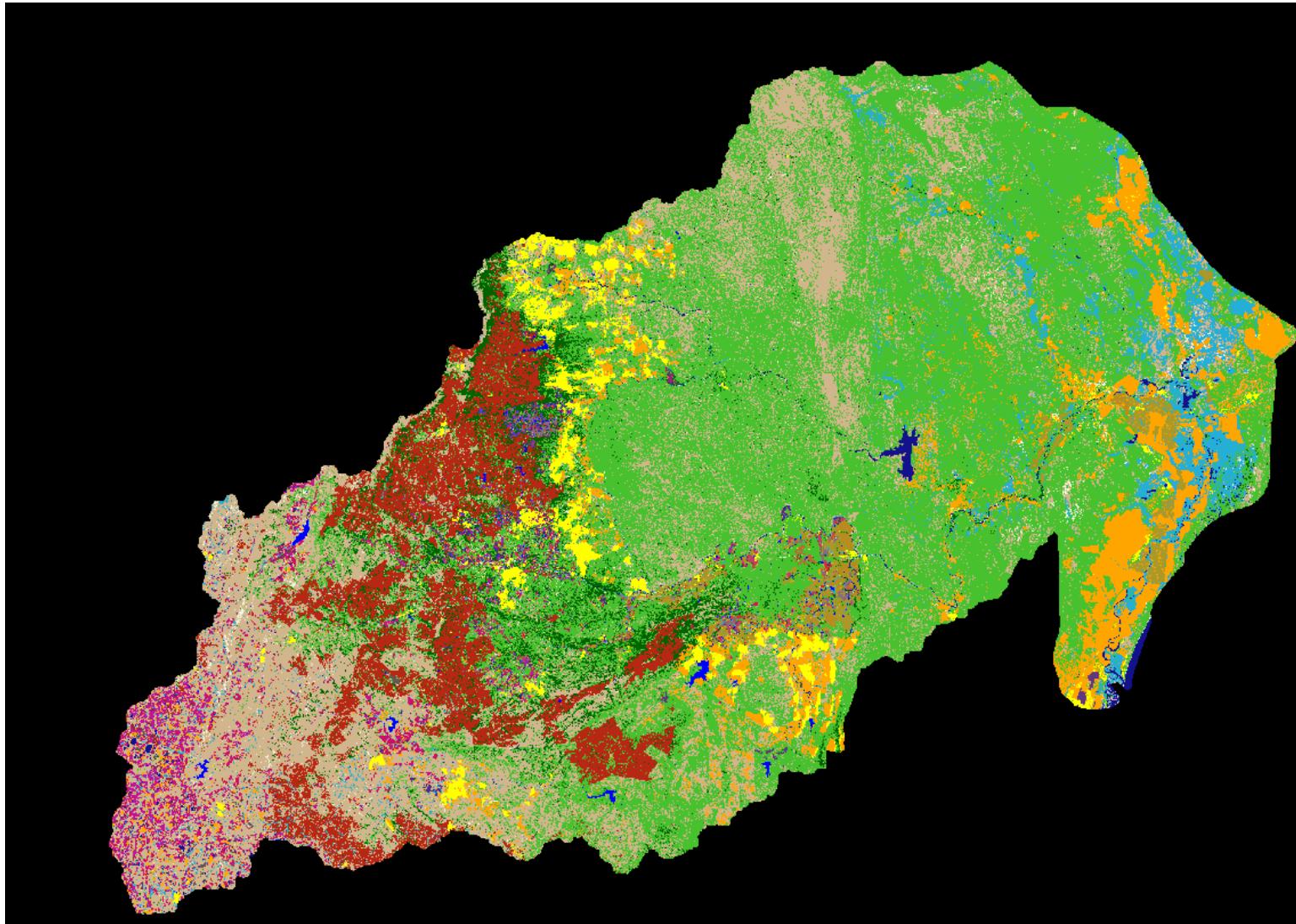
Tri-lateral agreement on sharing water resources are not met

[www.watplan.com](http://www.watplan.com)

**eleaf**  
FEED THE WORLD



# Detailed Land Use Map (40 classes)



- Forest/Woodland
- Bush/Shrub
- Grassland
- Plantations
- Water Natural
- Water Man-made
- Wetlands
- Mangrove
- Bare
- Agriculture: Rainfed
- Agriculture: Irrigated
- Agriculture: Sugarcane pivot
- Agriculture: Sugarcane non-pivot
- Urban
- Mines
- Agriculture: Horti banana
- Agriculture: Horti blueberries
- Agriculture: Horti citrus
- Agriculture: Horti coffee
- Agriculture: Horti granaat
- Agriculture: Horti passion fruit
- Agriculture: Horti pecan nuts
- Agriculture: Horti stone fruit
- Agriculture: Horti avocado
- Agriculture: Horti ginger
- Agriculture: Horti guava
- Agriculture: Horti kiwi
- Agriculture: Horti litchi
- Agriculture: Horti macadamia
- Agriculture: Horti mango
- Agriculture: Horti pawpaw
- Agriculture: Maize
- Agriculture: Planted pasture
- Agriculture: Soya beans
- Agriculture: Fallow
- Agriculture: Wheat
- Agriculture: Vegetable/other
- Agriculture: Horti other



# Balancing in and out

## Income and Expenditures

Click and drag the money to determine your income and expenditures

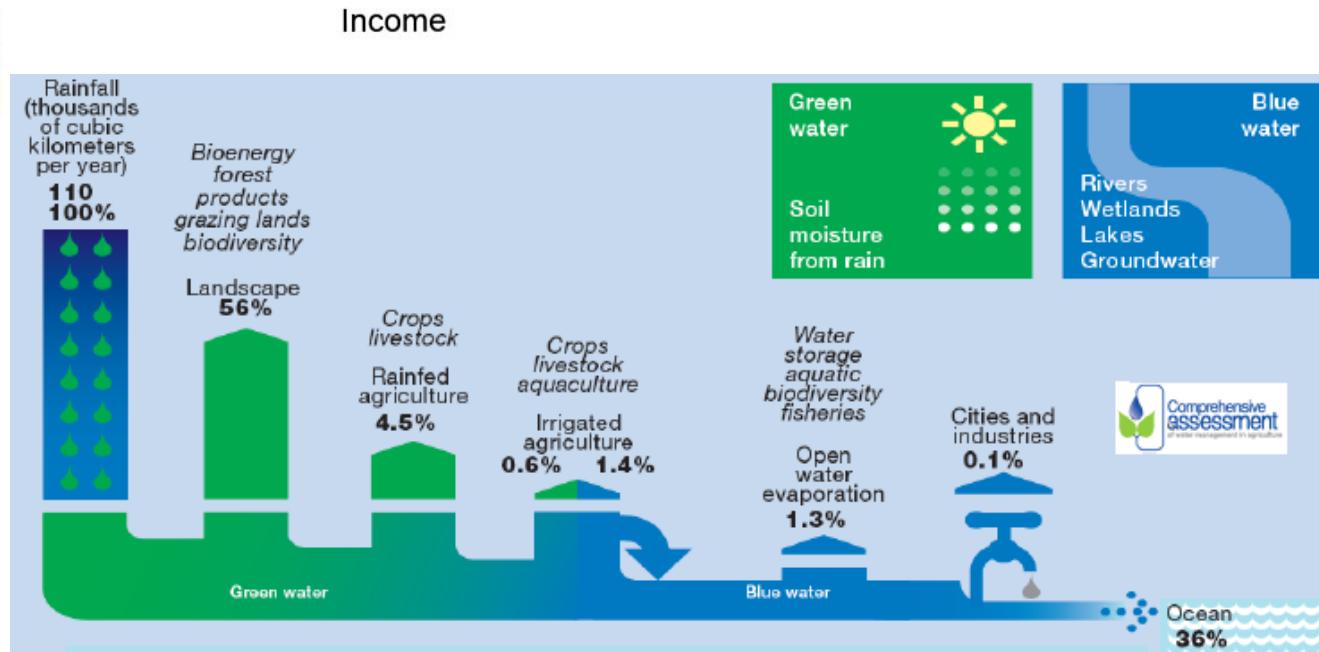


### Equation Check

Check to see if you have a savings or are in debt!

Total Income: \$

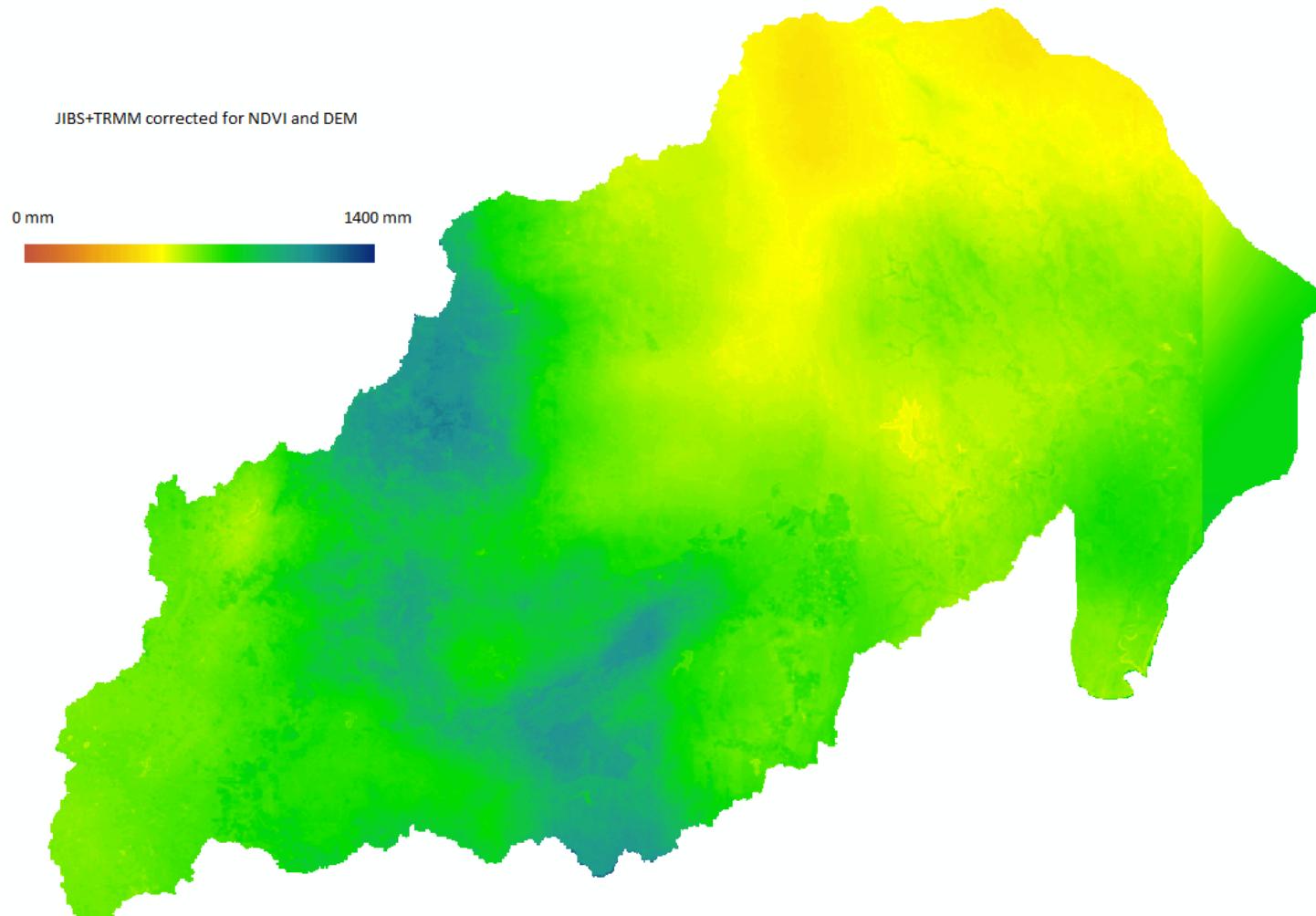
Total Expenditures: \$



*“Don’t use more than you have”*



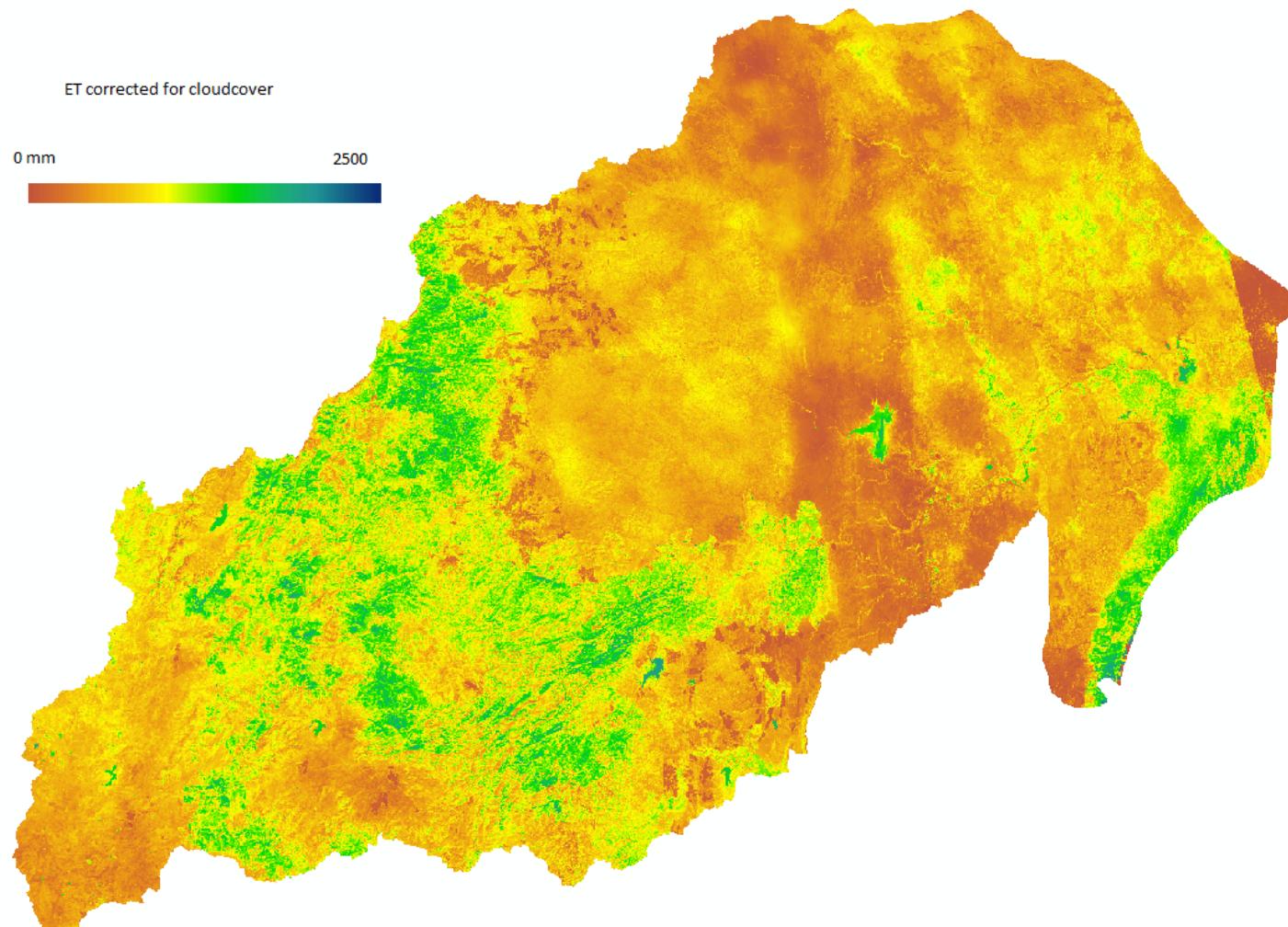
# How much water do we have ?



Downscaling of TRMM rainfall and local calibration: Zheng and Bastiaanssen (2013)

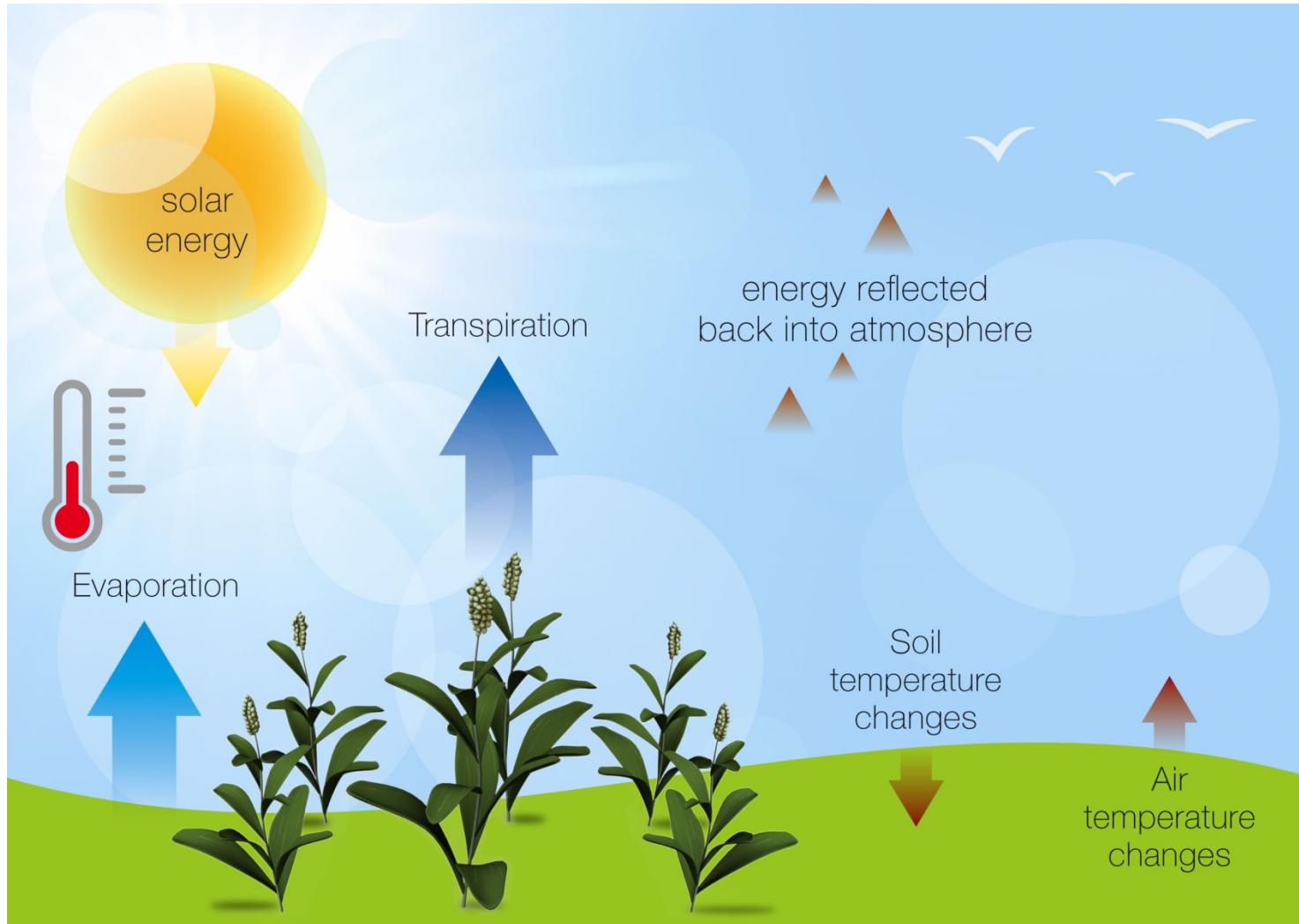


# How much water do we consume ?



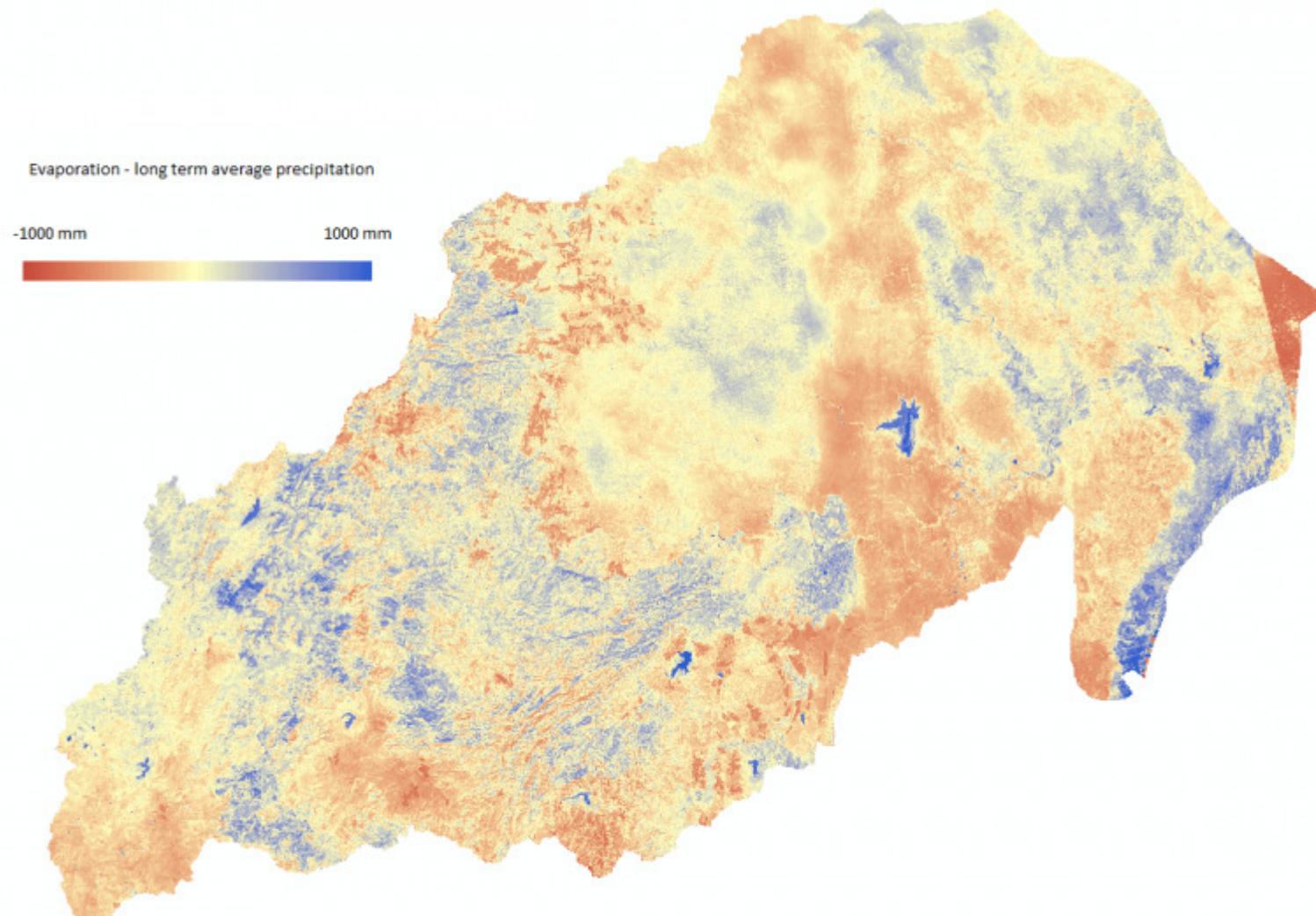


# Surface energy balance





# Balancing IN and OUT



Red areas generate runoff; blue areas withdraw water from river and aquifers

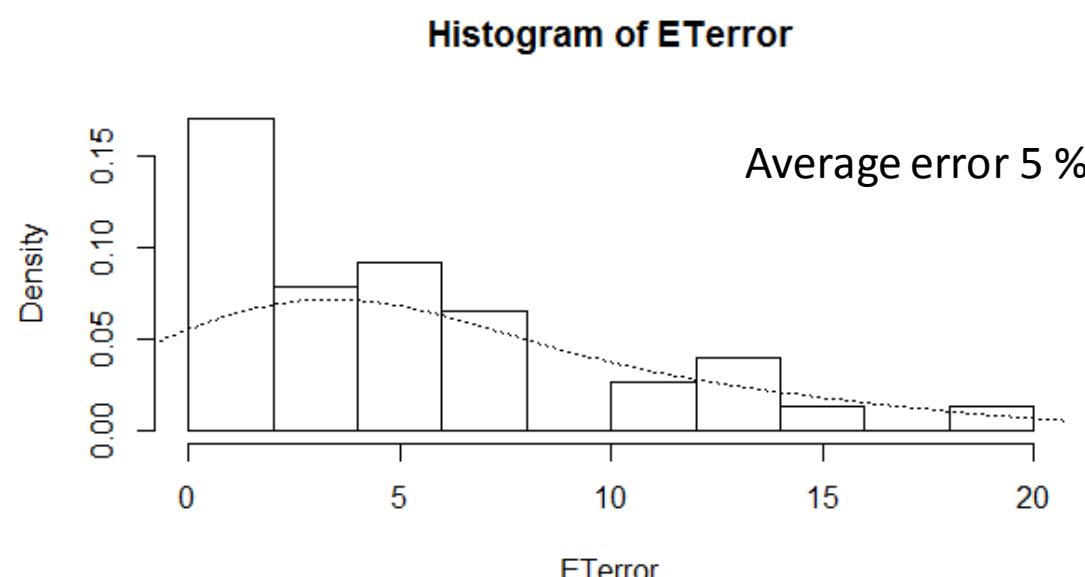
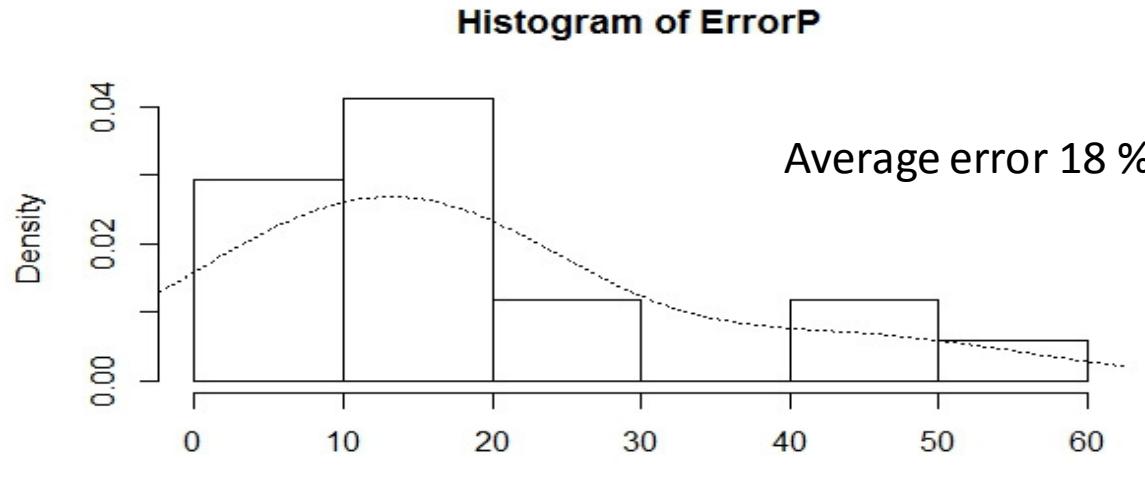


# Water production &consumption sheet

'Landclass'	Water volume (Mm3)
'Plantations'	-583
'Forest/Woodland'	-313
water'	-153
'Agriculture: Sugarcane non-pivot'	-149
'Wetlands'	-114
Horticulture'	-45
'Agriculture: Sugarcane pivot'	-35
'Agriculture: Irrigated'	-3
'Mangrove'	-3
<b>TOTAL WITHDRAWALS</b>	<b>-1398</b>
'Mines'	5
Agriculture: other'	27
'Bare'	44
'Agriculture: Maize'	47
'Agriculture: Planted pasture'	66
'Agriculture: Rainfed'	351
'Urban'	438
'Bush/Shrub'	977
'Grassland'	1208
<b>TOTAL RENEWABLE RESOURCES</b>	<b>3164</b>



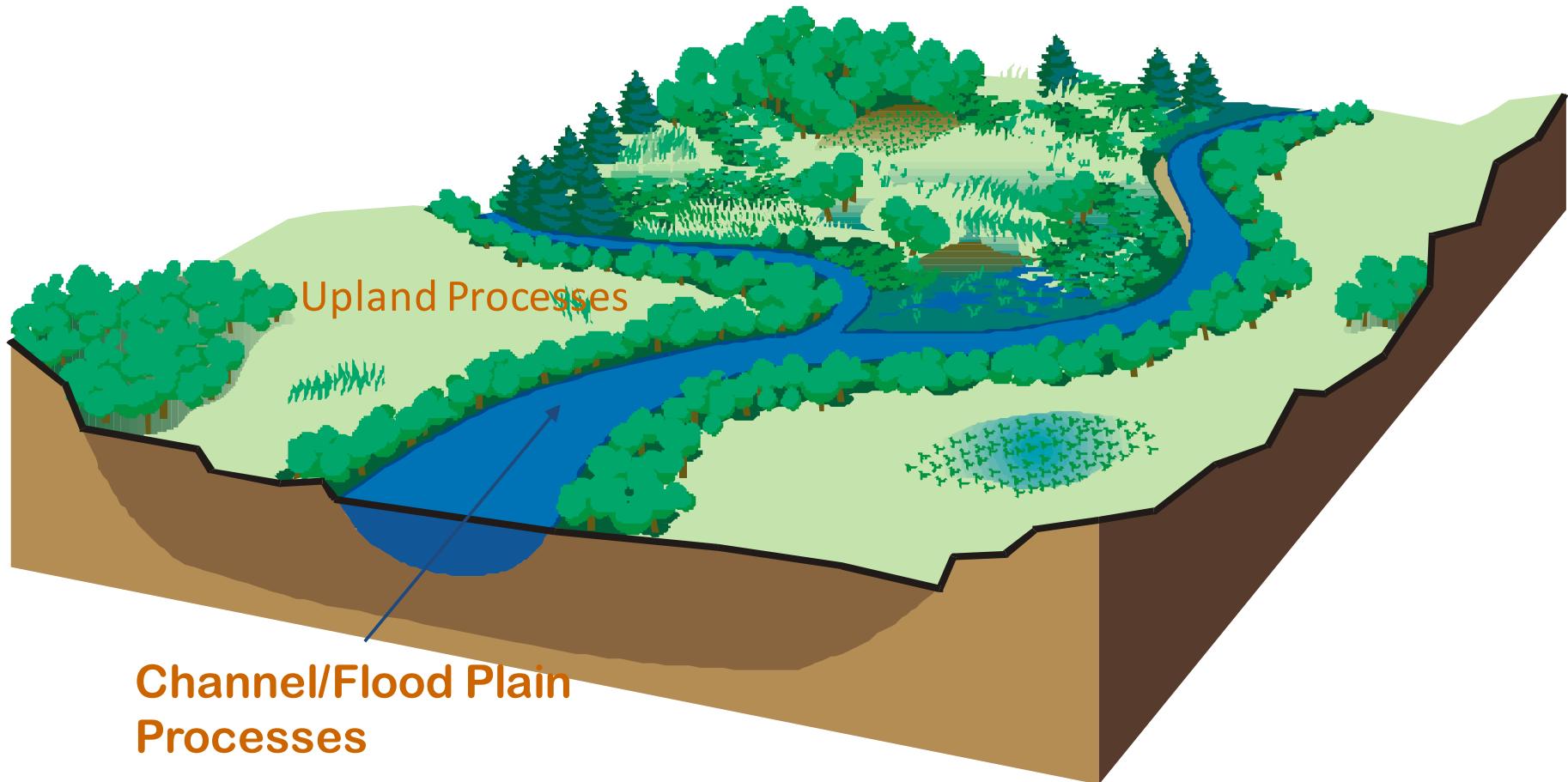
# Errors in remotely sensed water balances



Karimi and Bastiaanssen, 2013 (in prep)



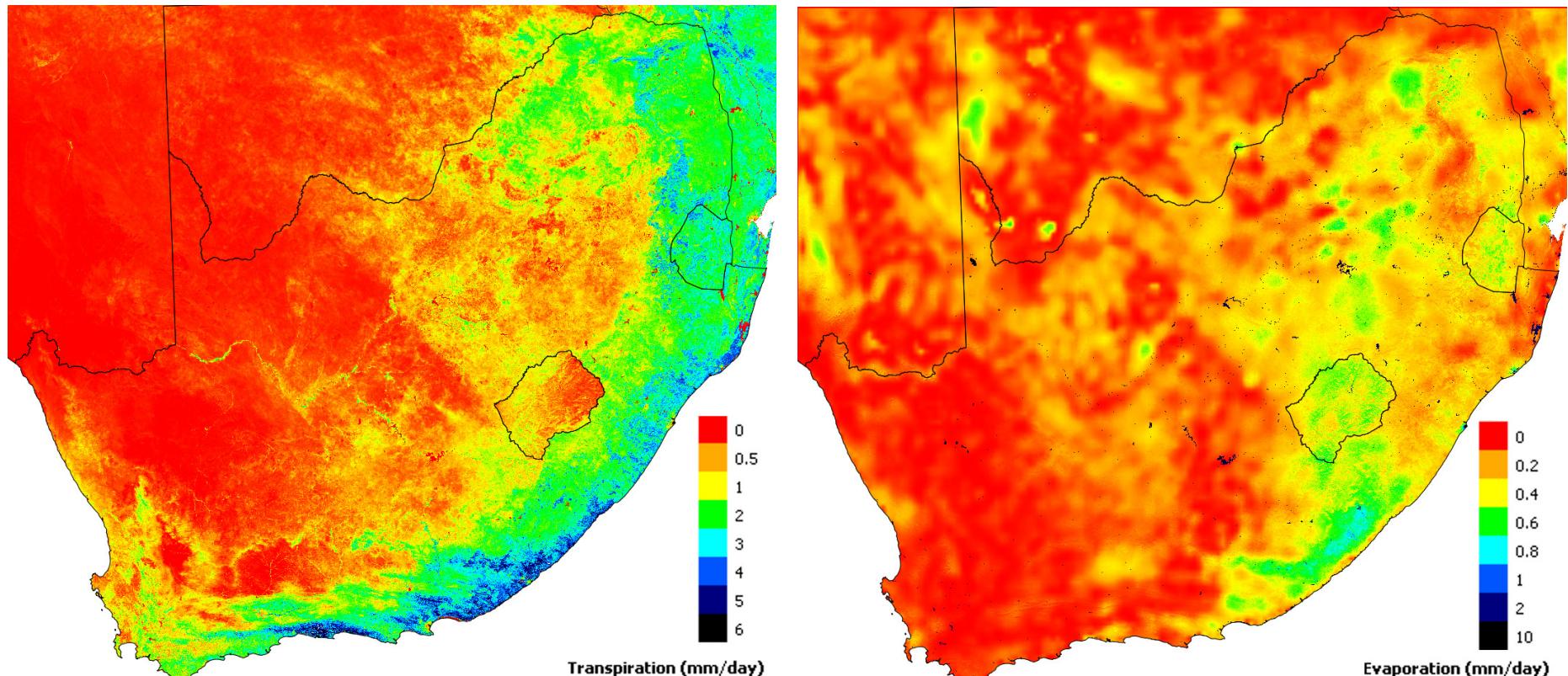
# Develop APPs !





# Towards first step in operational services

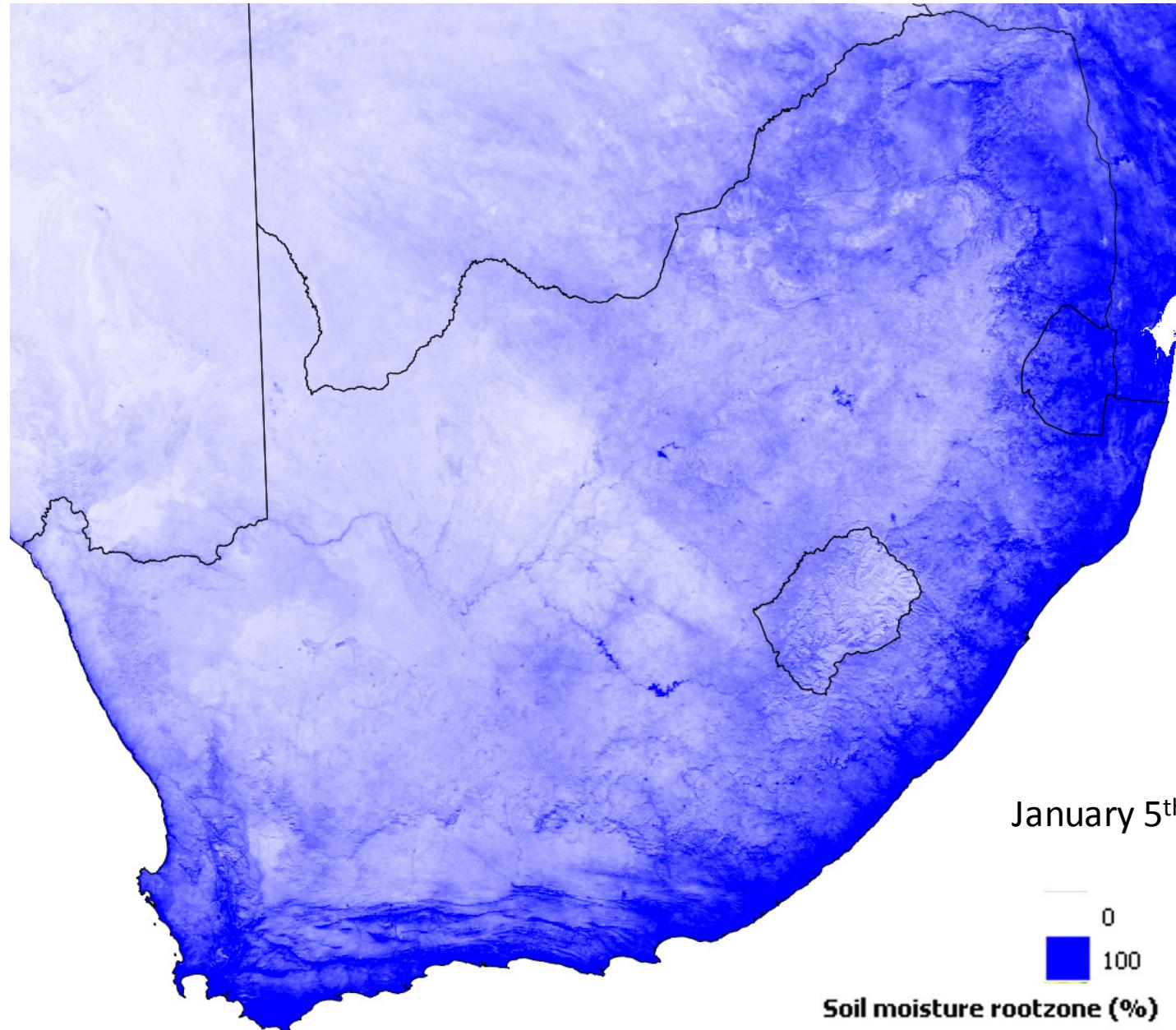
Transpiration & evaporation separated



January 5<sup>th</sup> (2013)

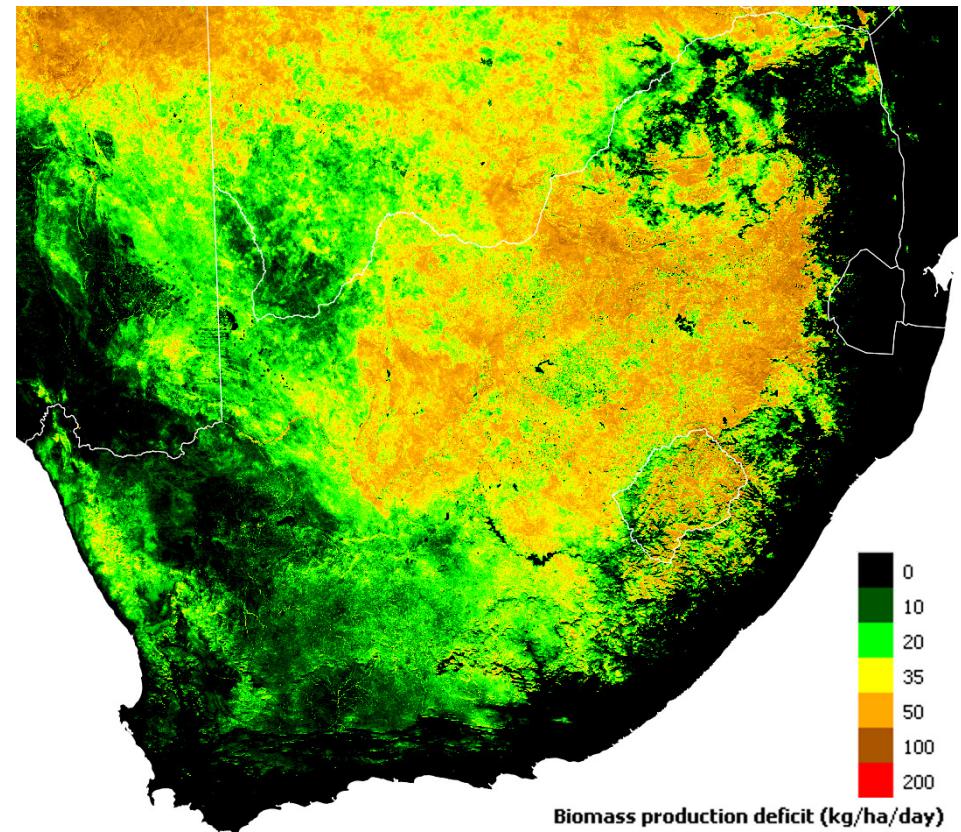
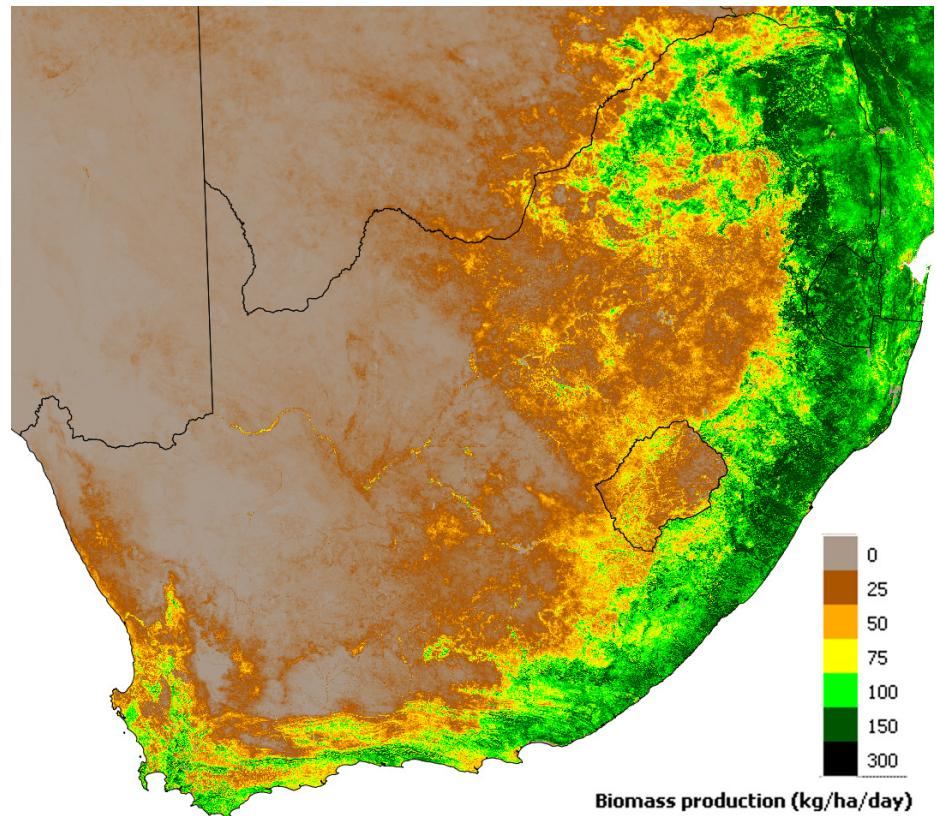


# Soil moisture at 375 m. Rootzone !





# Biomass production and impact of soil moisture



January 5<sup>th</sup> (2013)



# Conclusions

- A considerable list of spatial data components for water and climate services can be established from EO data
- Operational data streams in Africa appeared to be feasible and doable; recipient organizations continue after FP7
- Development of APPs are the key for solutions
- Some key applications should be related to renewable water resources, water allocation, withdrawals and water accounting
- An operational system is in place for Africa, Lesotho, Swaziland and Mozambique (250 m x 250 m; daily)
- Upscaling to other countries is feasible

This research has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under Grant Agreement no. 262949. This information reflects only the author's views and the Union is not liable for any use that may be made of that information.





---

*Thank you !*

