

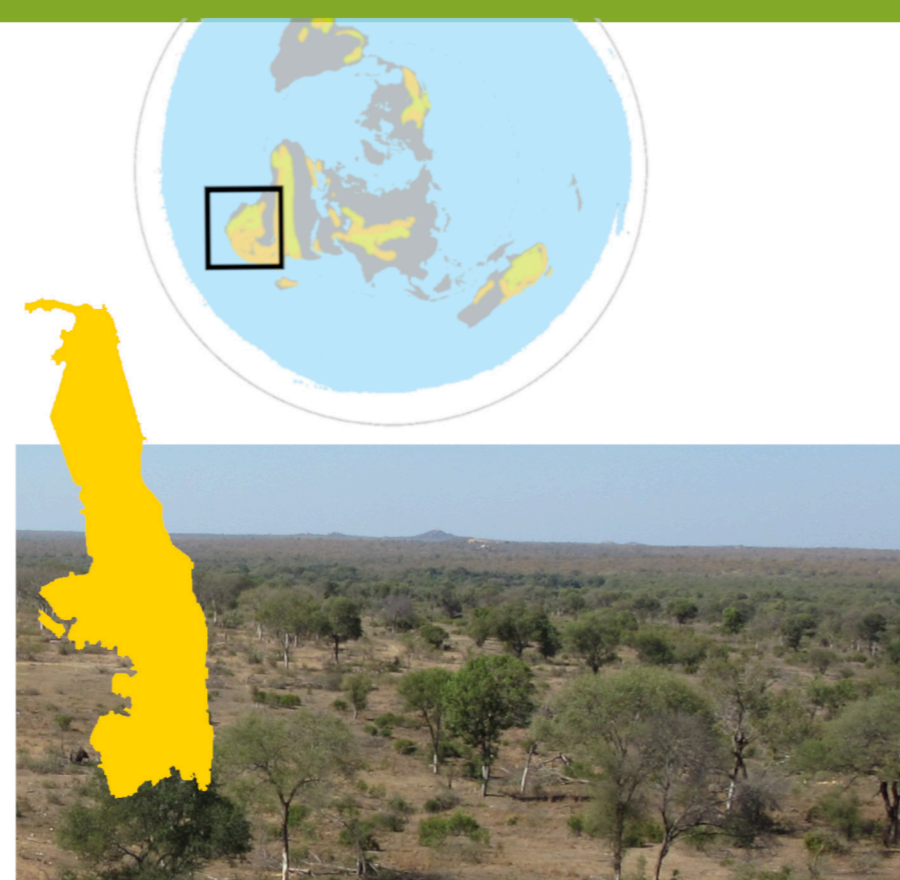
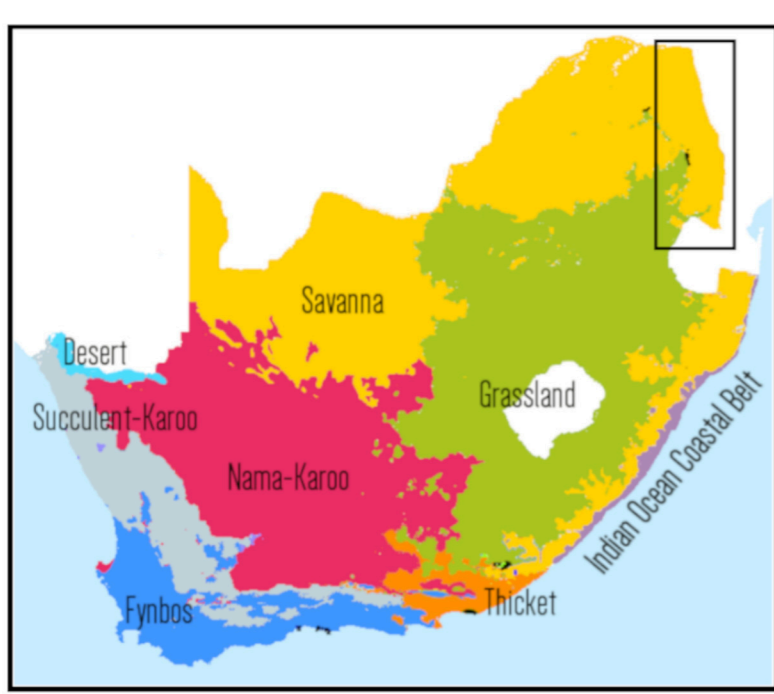
VEGETATION DYNAMICS AND DROUGHT IN SAVANNAS

Semiarid rangelands are a mosaic of land uses, where extensive livestock is the main economic activity. They are highly controlled by the availability of water. The increase in drought intensity, duration, and frequency, changes in agricultural practices, and other socioeconomic and environmental factors precipitate their degradation.

We want to map water consumption and primary production of semiarid mosaic crop-rangelands at the optimal spatiotemporal scales, setting up an open-source cloud framework to monitor these processes' interaction in the long term and analyze system tipping points.



<https://www.uco.es/dfh/>



Our pilot area is the Kruger National Park in South Africa

In savanna, water soil dynamics play a key role in the distribution of functional vegetation types and their main productions. To design early warning and conservation strategies, it is necessary to know the specific characteristics of this relationship.

Through the integration of remotely sensed data into models, we can evaluate, on the one hand, the water consumed by semiarid ecosystems and their vegetation water stress and, on the other, its primary production. This information can help reduce the uncertainty associated with the administration and farmers' decision-making processes.



[1]



[2]



[3]

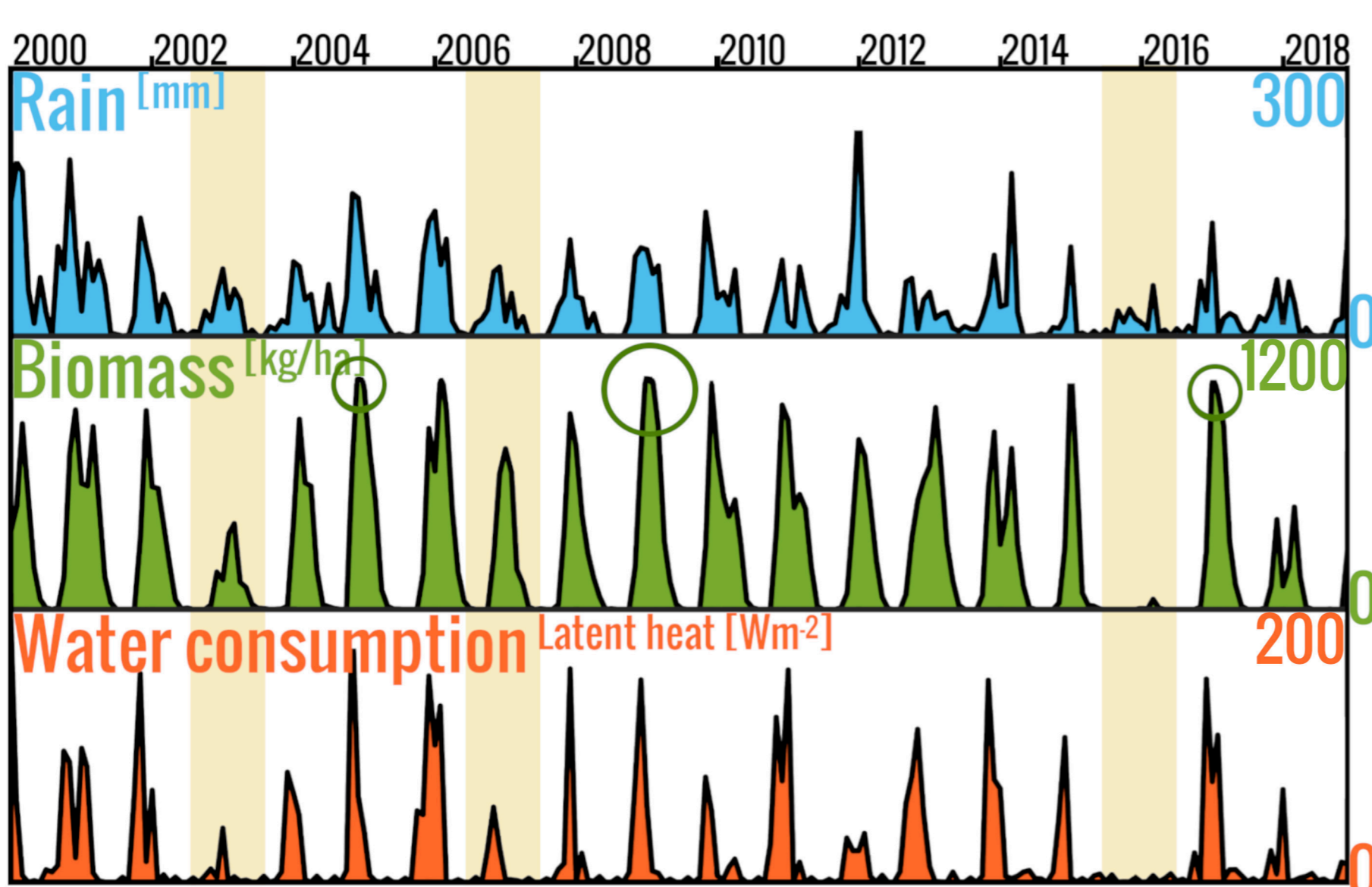
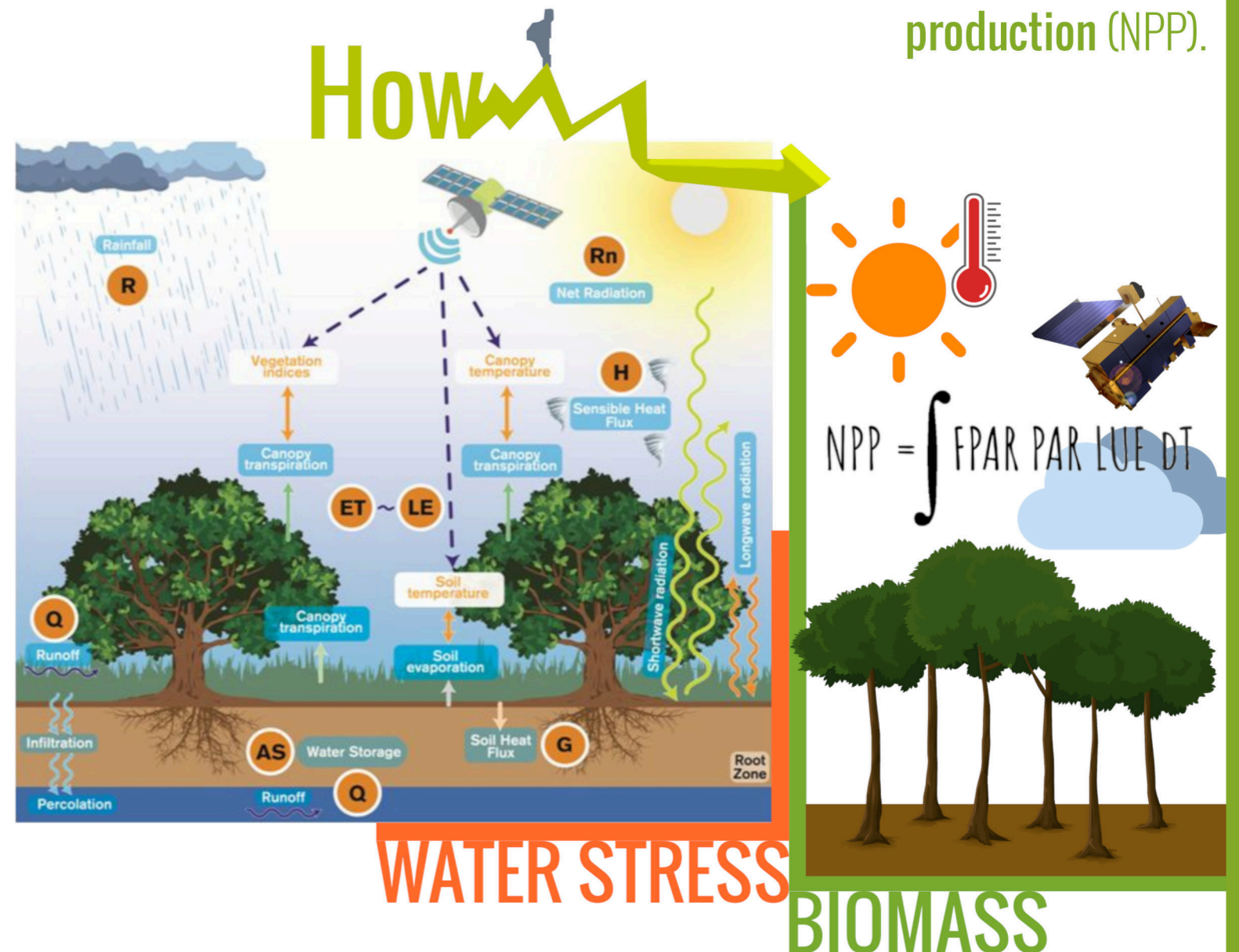


[4]



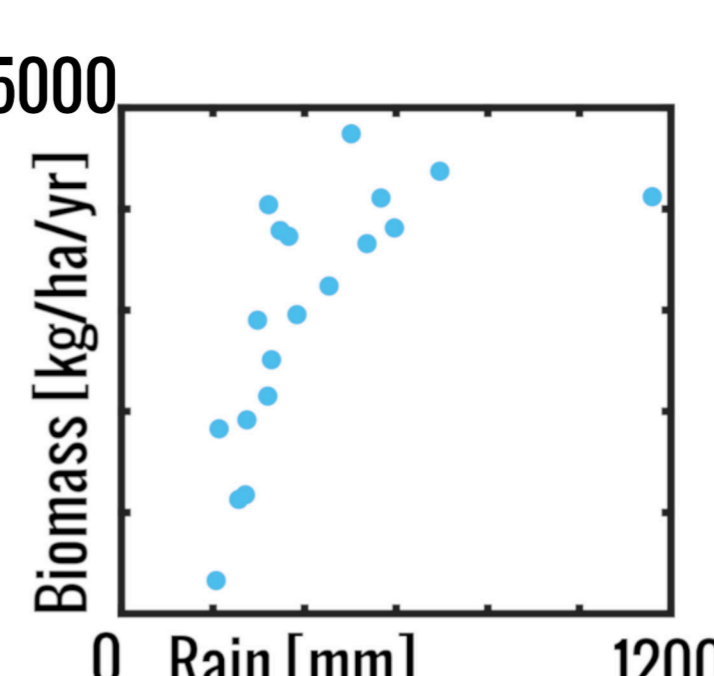
[5]

Integrating remotely sensed data in **water and energy balance** [1], [2],[3], [4] and **carbon assimilation** models [5] allows estimating actual and potential **evapotranspiration (ET)** and **net primary production (NPP)**.

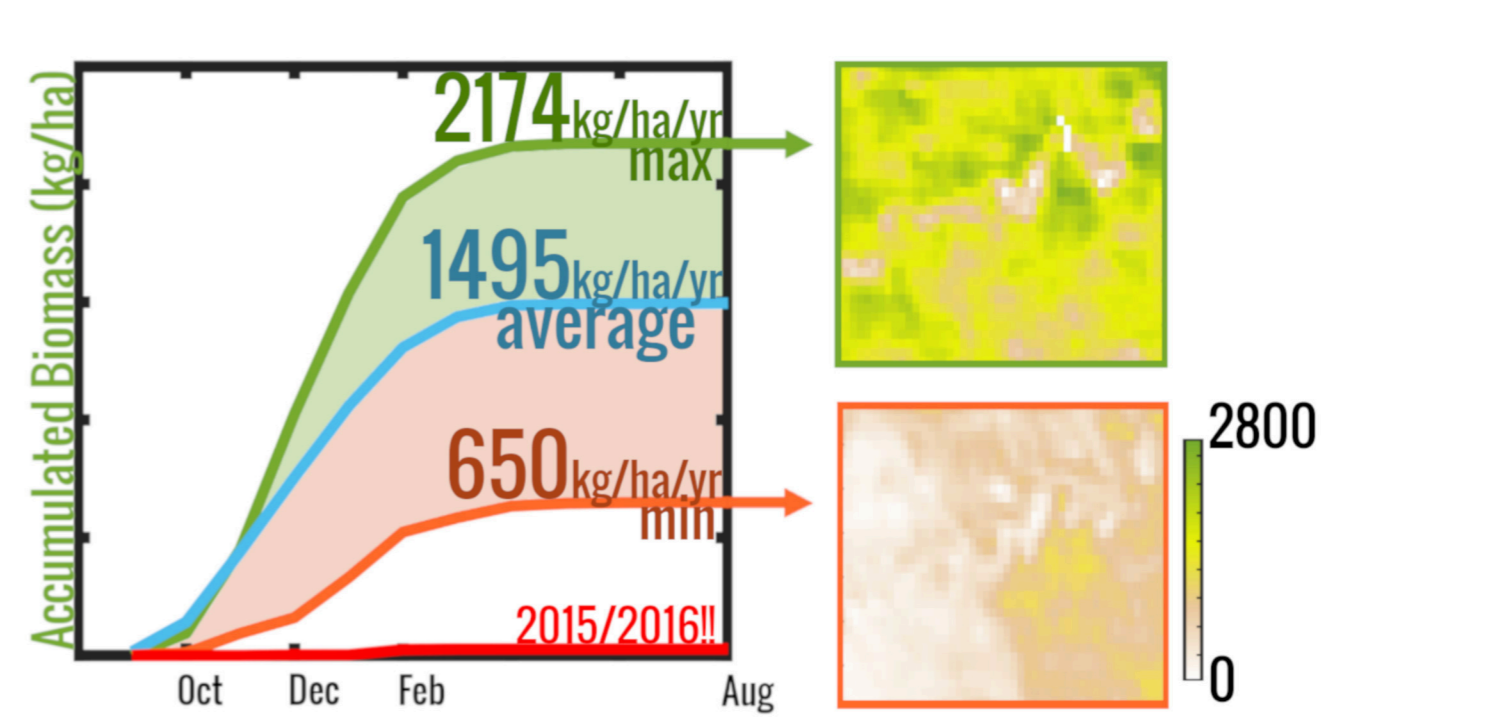


■ Drought events
● Production Peak

More rain means more production (until it reaches a plateau when the limiting factor is not water but available energy or nutrients).



The decreasing in production is completely related with the periods with less water availability, being the worst hydrological years 2015-16, 2002-03 and 2007-8. After drought events there is usually a peak on pasture production, maybe because the pool of nutrients is bigger than in average years.



We can have **production curves** for different Park areas, giving the managers a range to plan and supervise the stocking rates or animal movements.