

Crop Production and water consumption

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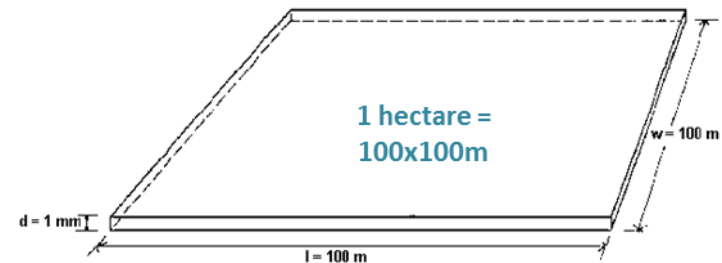


Water Consumption

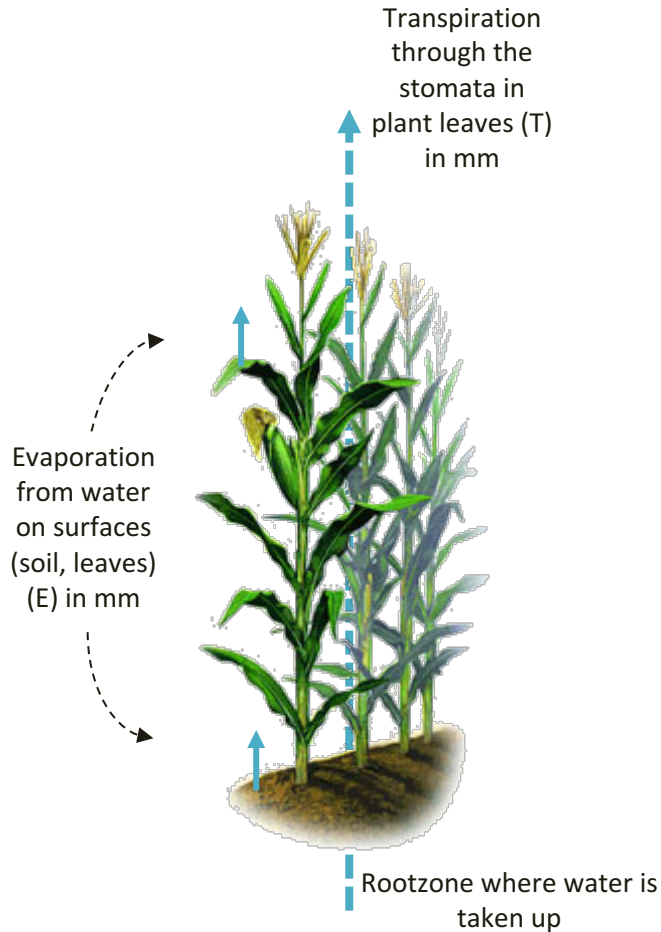
- Evapotranspiration is $E+T$ (mm)

WHY in mm?

Rather abstract, but it enables us to compare and convert crop water consumption to metric volume.



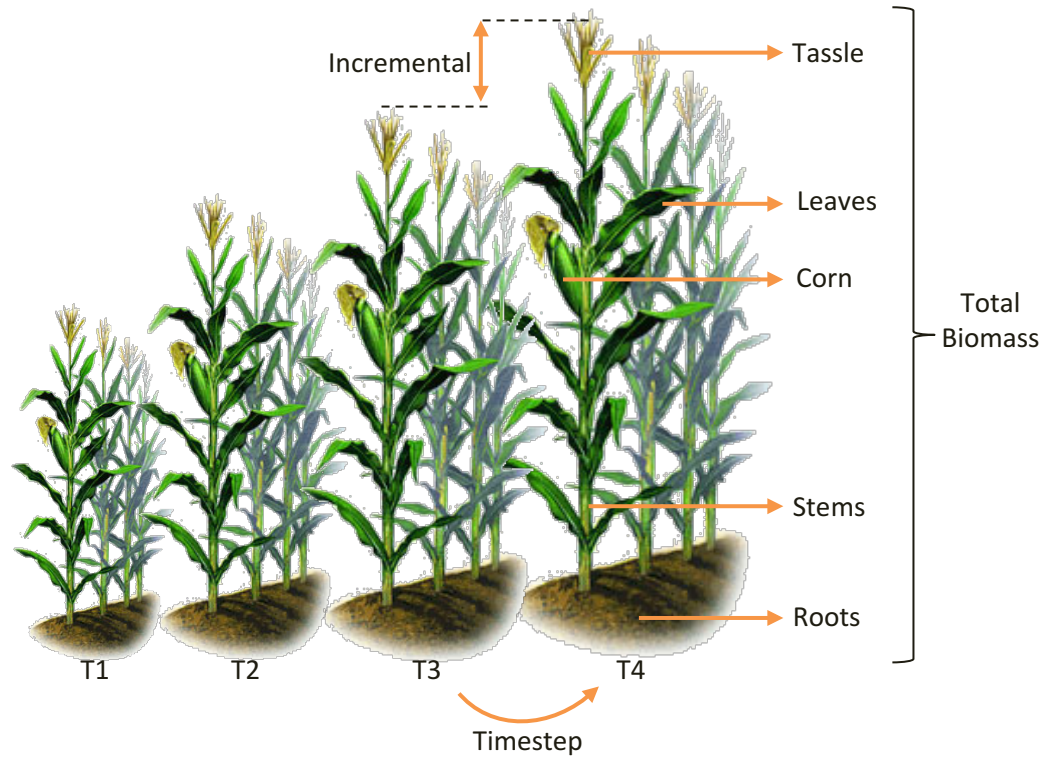
1mm of water on $1\text{m}^2 = 1 \text{ liter}$
1mm of water on 1 ha = 10m^3



Total volume of **water** used for crop production (mm/timestep)



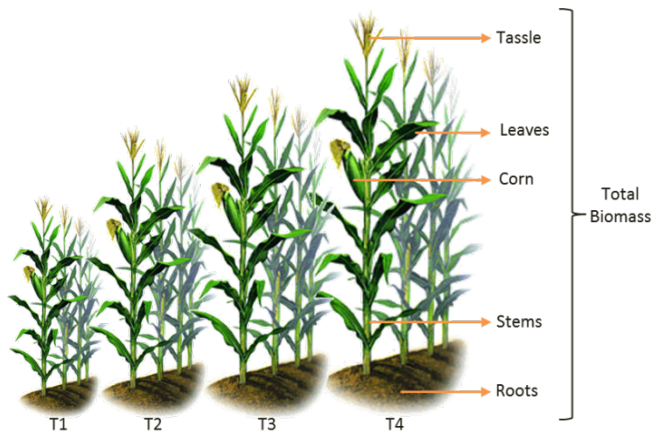
Biomass Production



Volume of **biomass** produced
(kg/ha/timestep)



(Biomass) Water Productivity

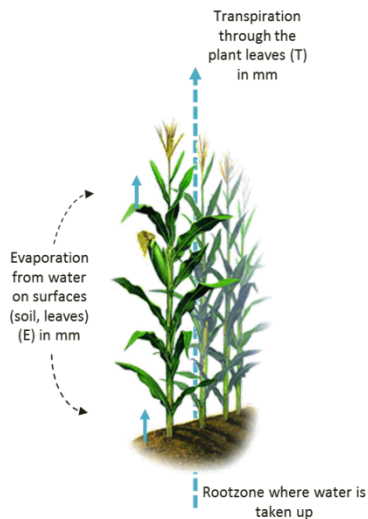


Total Biomass
production

in $\frac{\text{kg}}{\text{m}^3}$

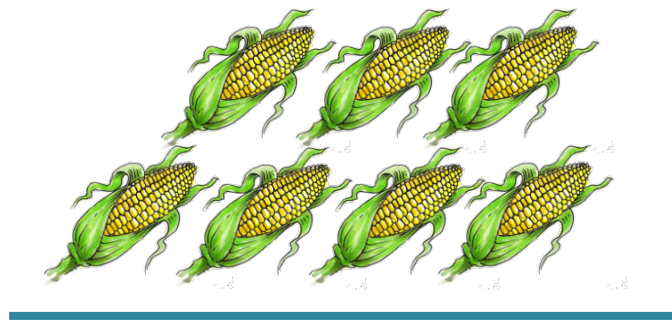
Volume of water
consumed
(ET)

(per time step)





Water Productivity



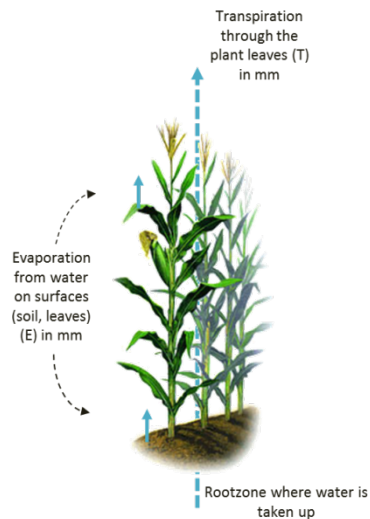
=

Yield

in $\frac{\text{kg}}{\text{m}^3}$

Volume of water
consumed

(per time step)





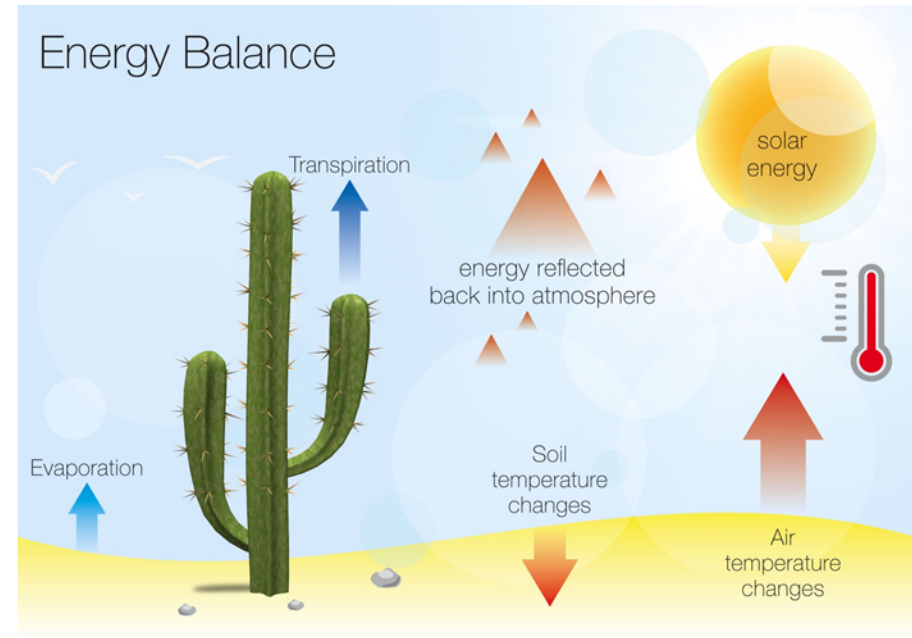
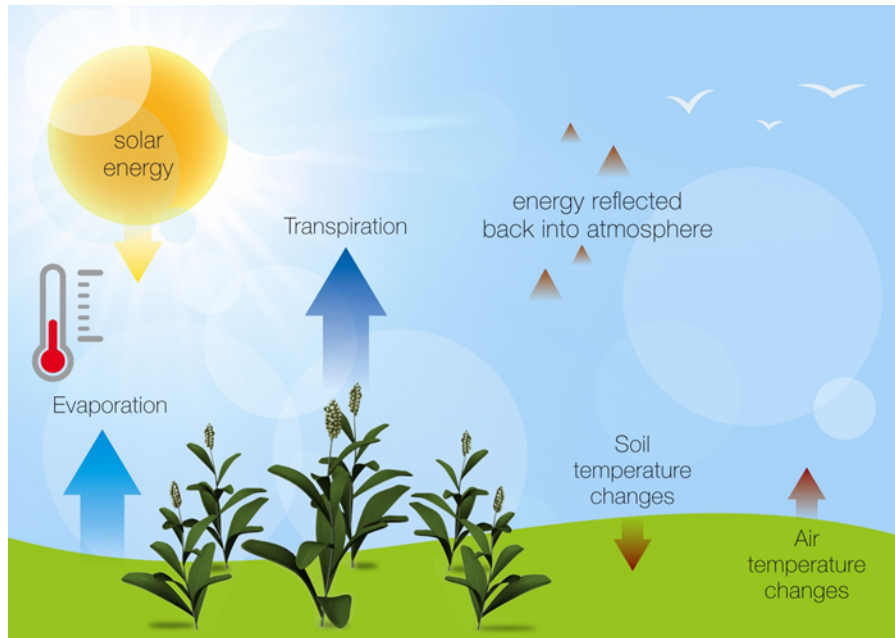
Economic Water Productivity

$$\frac{\text{Monetary Value}}{\text{Volume of water consumed}} \text{ in } \frac{\$}{\text{m}^3} \text{ (per time step)}$$

The diagram illustrates the components of the Economic Water Productivity formula. The numerator, 'Monetary Value', is represented by five gold dollar signs (\$\$\$\$) above a horizontal line. The denominator, 'Volume of water consumed', is represented by a diagram of a corn plant with three labeled arrows: a dashed arrow for 'Evaporation from water on surfaces (soil, leaves) (E) in mm', a solid arrow for 'Transpiration through the plant leaves (T) in mm', and a solid arrow for the 'Rootzone where water is taken up'.



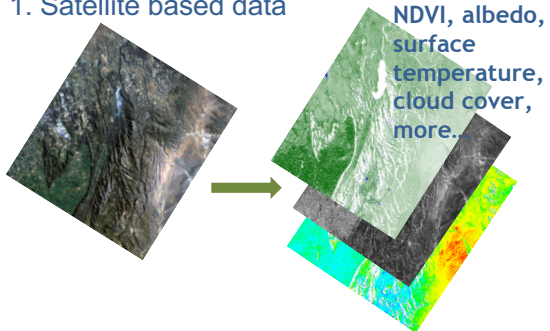
Energy Balance





INPUTS

1. Satellite based data

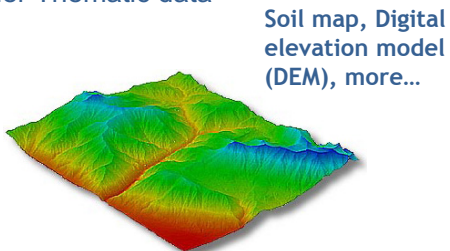


2. Weather station data



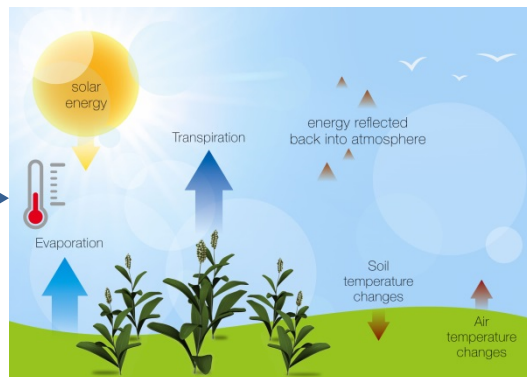
Gridded with MeteoLook

3. Other Thematic data



PROCESS

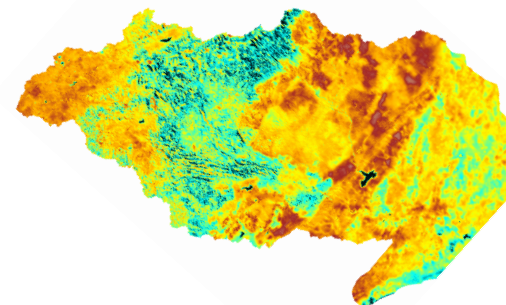
Solving the energy balance.



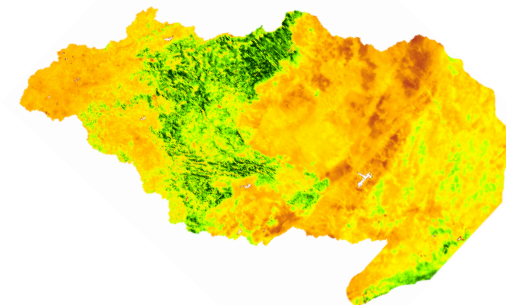
The energy balance includes and quantifies the different sources and consumers of the available energy .

OUTPUTS

Evapotranspiration (ET): When the *residual* energy is known that is available for crop growth, the associated water consumption can be calculated in mm



Biomass production can then be calculated using algorithms based on photosynthesis and plant stress factors in kg/ha





Thank you !



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