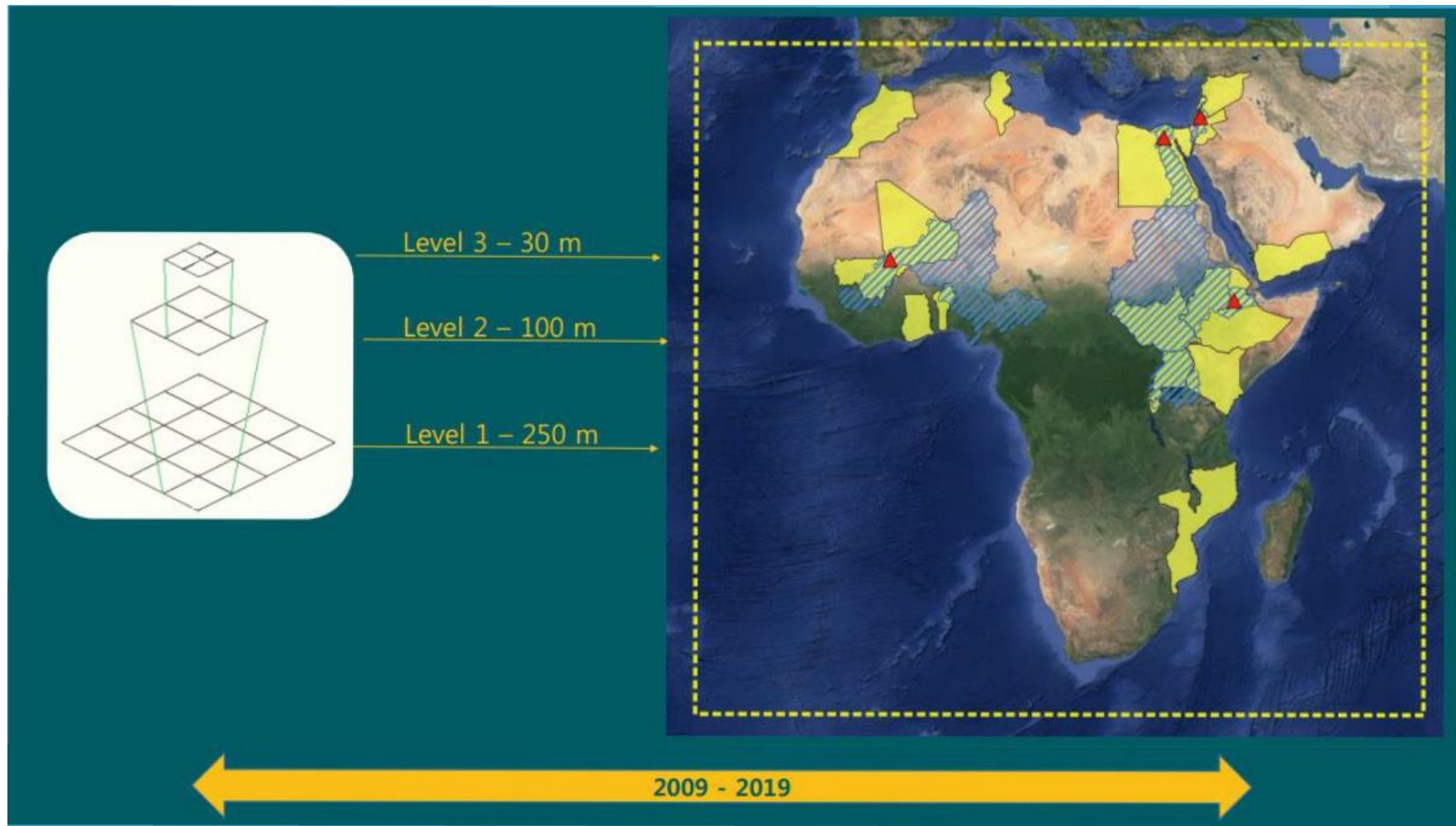


WaPOR – Technical Specs

FAO Water Productivity Database

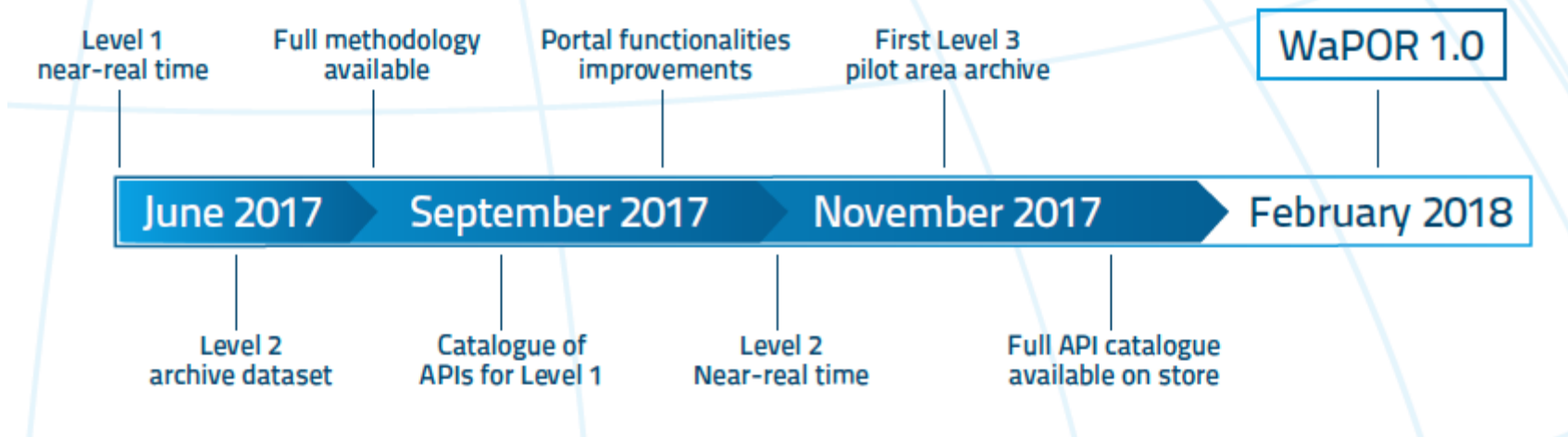


Coverage



Timeline

WaPOR Timeline



Historical data processing, and near real time processing (2017)

Database demo

- Beta version



- Map Layout



- Basemap / Background
- Visible layer

- Map Filter



- Dataset and year

- Browse data



- Metadata
- Download data (year or set range)

Datasets

Gross Biomass Water Productivity



The annual Gross Biomass Water Productivity expresses the quantity of output (above ground biomass production) in relation to the total volume of water consumed in the year (actual evapotranspiration). By...

Net Biomass Water Productivity



The annual Net Biomass Water Productivity expresses the quantity of output (above ground biomass production) in relation to the volume of water beneficially consumed (by canopy transpiration) in the year,...

Actual EvapoTranspiration (Annual)



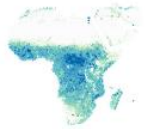
The EvapoTranspiration (ET) is the sum of the soil evaporation (E) and canopy transpiration (T). The value of each pixel represents the annual actual evapotranspiration in a given year.

Above Ground Biomass Production (Annual)



The annual Above Ground Biomass Production expresses the total amount of dry matter produced over the year. It is calculated by dekad and summarized as annual total. Each pixel represents the amount of...

Transpiration (Annual)



The annual Transpiration is the portion of annual ETa due to canopy transpiration only (net of soil evaporation). The value of each pixel represents the total annual transpiration for that specific year.

Actual EvapoTranspiration (Dekadal)



The Evapotranspiration (ET) is the sum of the soil evaporation (E) and canopy transpiration (T). The value of each pixel represents the average daily actual evapotranspiration for that specific dekadal.

Transpiration Fraction



Transpiration Fraction is an additional, complementary data layer that is provided with the AET data component. Each pixel of this data layer indicates which % of AET is made up of transpiration for that...

Reference EvapoTranspiration



Reference evapotranspiration (RET) is defined as the evapotranspiration from a hypothetical reference crop and it simulates the behaviour of a well-watered grass surface. Each pixel represents the daily reference...

Net Primary Production



Net Primary Production (NPP) is a fundamental characteristic of an ecosystem, expressing the conversion of carbon dioxide into biomass driven by photosynthesis. The pixel value represents the mean...

Precipitation

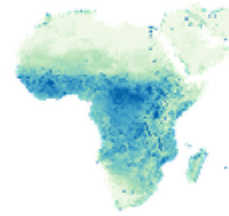


Precipitation data is delivered on a daily basis. The source of this dataset is CHIRPS (Climate Hazards Group InfraRed Precipitation with Station) quasi-global rainfall dataset, starting from 1981 up to near...

Actual EvapoTranspiration

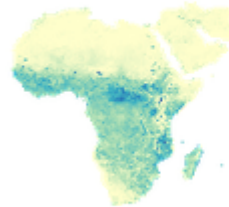
- Based on ETLook and Penman-Monteith equation (energy balance modelling)
- Influence of climate and soil moisture
- Calculation per annual or decadal
- Decadal is average for the decadal

Actual EvapoTranspiration (Annual)



The EvapoTranspiration (ET) is the sum of the soil evaporation (E) and canopy transpiration (T). The value of each pixel represents the annual actual evapotranspiration in a given year.

Actual EvapoTranspiration (Dekadal)



The Evapotranspiration (ET) is the sum of the soil evaporation (E) and canopy transpiration (T). The value of each pixel represents the average daily actual evapotranspiration for that specific dekad.

Transpiration

- Beneficial consumption
- ETLook solves for soil evaporation and canopy transpiration
- Fraction = T/ET
- Calculated per dekadal (average of dekadal)
- Only over vegetated surfaces

Transpiration (Annual)



The annual Transpiration is the portion of annual ET_a due to canopy transpiration only (net of soil evaporation). The value of each pixel represents the total annual transpiration for that specific year.

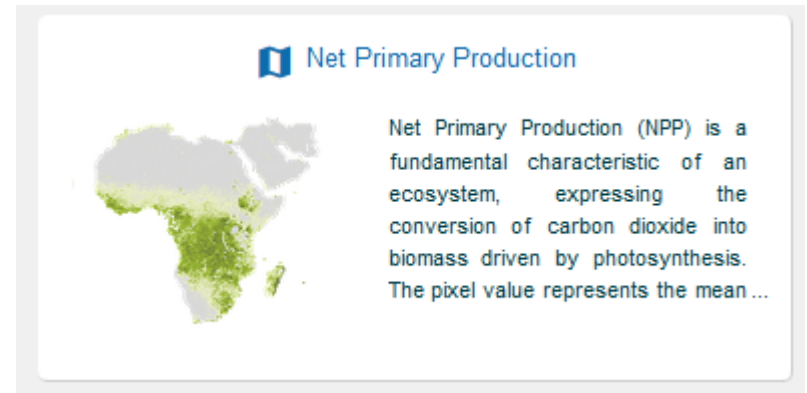
Transpiration Fraction



Transpiration Fraction is an additional, complementary data layer that is provided with the AET data component. Each pixel of this data layer indicates which % of AET is made up of transpiration for that...

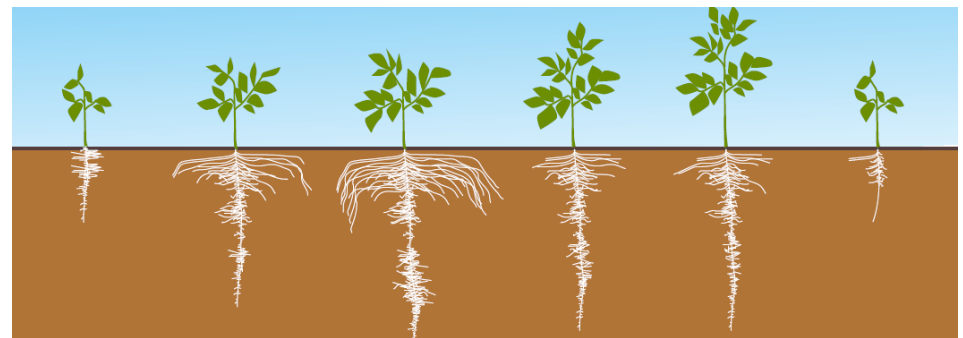
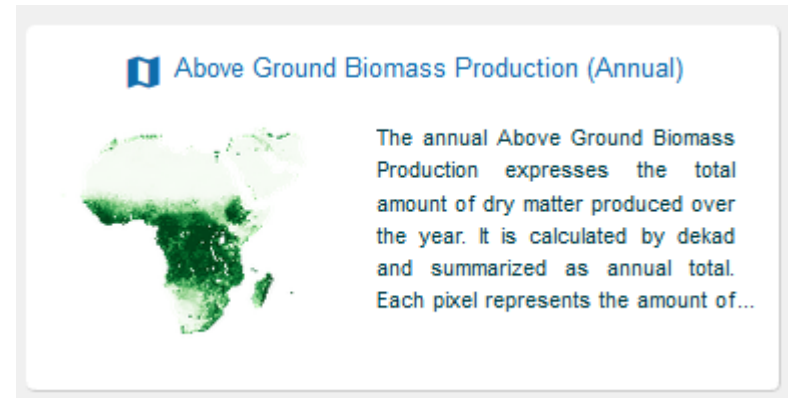
Biomass Production (NPP)

- Net Primary Production is conversion to biomass by photosynthesis
- LUE used from last known land cover, end of season will give correction factors (if LU changed)
- Reduction factor for soil moisture stress
- Other stresses included indirectly in fAPAR (related to NDVI)



Biomass Production (AGBP)

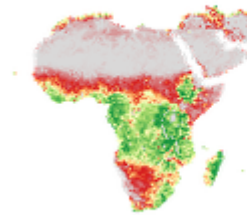
- Above Ground Biomass Production
- Conversion:
 - root-shoot ratio = 0.65
 - gC to kgDM (dry matter)
- Summation over the course of the season (Annual or user-defined)



Gross / Net Biomass Water Productivity

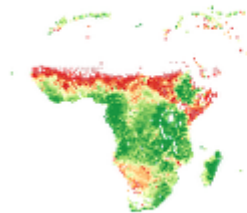
- Gross WP = $AGBP / AET$
- Net WP = $AGBP / T$
- AGBP Above Ground Biomass Production
- AET Actual EvapoTranspiration
- T Transpiration (beneficial consumption)
- Annual or user defined decadal

Gross Biomass Water Productivity



The annual Gross Biomass Water Productivity expresses the quantity of output (above ground biomass production) in relation to the total volume of water consumed in the year (actual evapotranspiration). By ...

Net Biomass Water Productivity

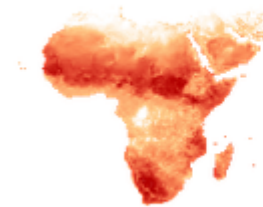


The annual Net Biomass Water Productivity expresses the quantity of output (above ground biomass production) in relation to the volume of water beneficially consumed (by canopy transpiration) in the year, ...

Reference ET and Precipitation

- Reference ET at resolution of 20km
- Penman Monteith (for grass)
- Weather and solar radiation data
- Precipitation from CHIRPS

Reference EvapoTranspiration



Reference evapotranspiration (RET) is defined as the evapotranspiration from a hypothetical reference crop and it simulates the behaviour of a well-watered grass surface. Each pixel represents the daily reference...

Precipitation



Precipitation data is delivered on a daily basis. The source of this dataset is CHIRPS (Climate Hazards Group InfraRed Precipitation with Station) quasi-global rainfall dataset, starting from 1981 up to near...

Continuation

- Land Use classification (Level II maize, wheat, rice)
 - Rainfed and Irrigated areas
 - Statistics by Land Use class, River Basin, and user defined polygon
 - Crop calendars and harvest index (Level II and III)
 - User-defined time periods (instead of Annual)
 - Several more
-
- Give suggestions to wapor@fao.org

Hands-on Exercises

- Take your laptop / tablet, connect to WiFi

- Go to WaPOR:

<http://www.fao.org/in-action/remote-sensing-for-water-productivity/wapor>

- Exercise 1

Navigate to an agricultural area (e.g. Bekaa Valley), and select a pixel.

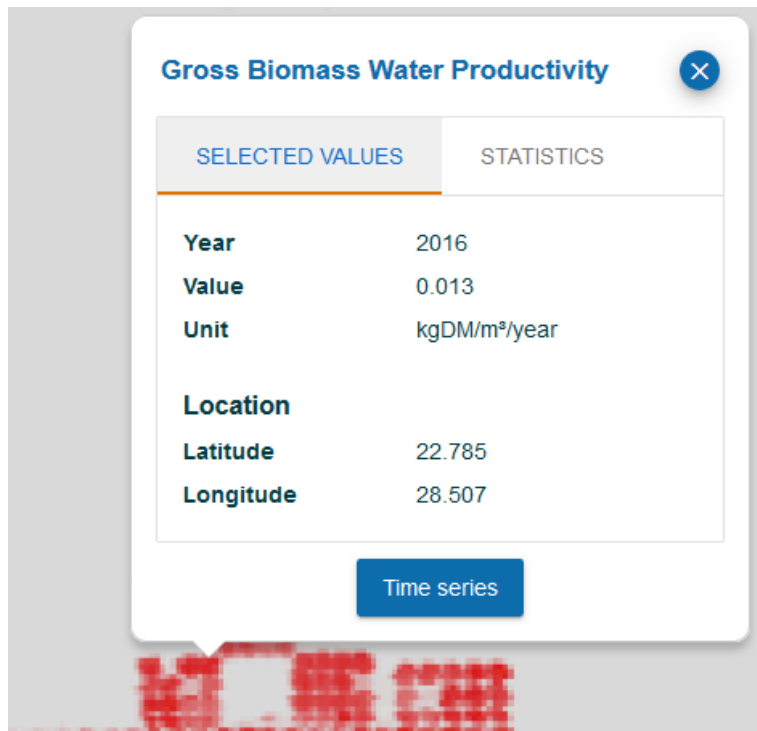
Compare the actual annual ET vs gross water productivity for 2010-2016

Optional: Compare the actual annual Transpiration vs net water productivity

Hands-on Exercises

- Exercise 2:

Calculate the percentage of water savings (ETa) or biomass production (AGBP) that occurs with the increase in water productivity.



WaPOR Trainings DGIS partner countries

- Benin (Hans vd Kwast) 19-20 June
- Ghana (Jonna v Opstal) 27-28 June
- Kenya (Poolad Karimi) 26-27 June
- Mozambique (Poolad Karimi) 29-30 June
- Jordan (Jonna v Opstal) 2-3 July
- West Bank (Jonna v Opstal) 5-6 July
- Rwanda (Hans vd Kwast) July
- Mali (Hans vd Kwast) August
- Ethiopia (Jonna v Opstal) August

Local project partners are welcome

