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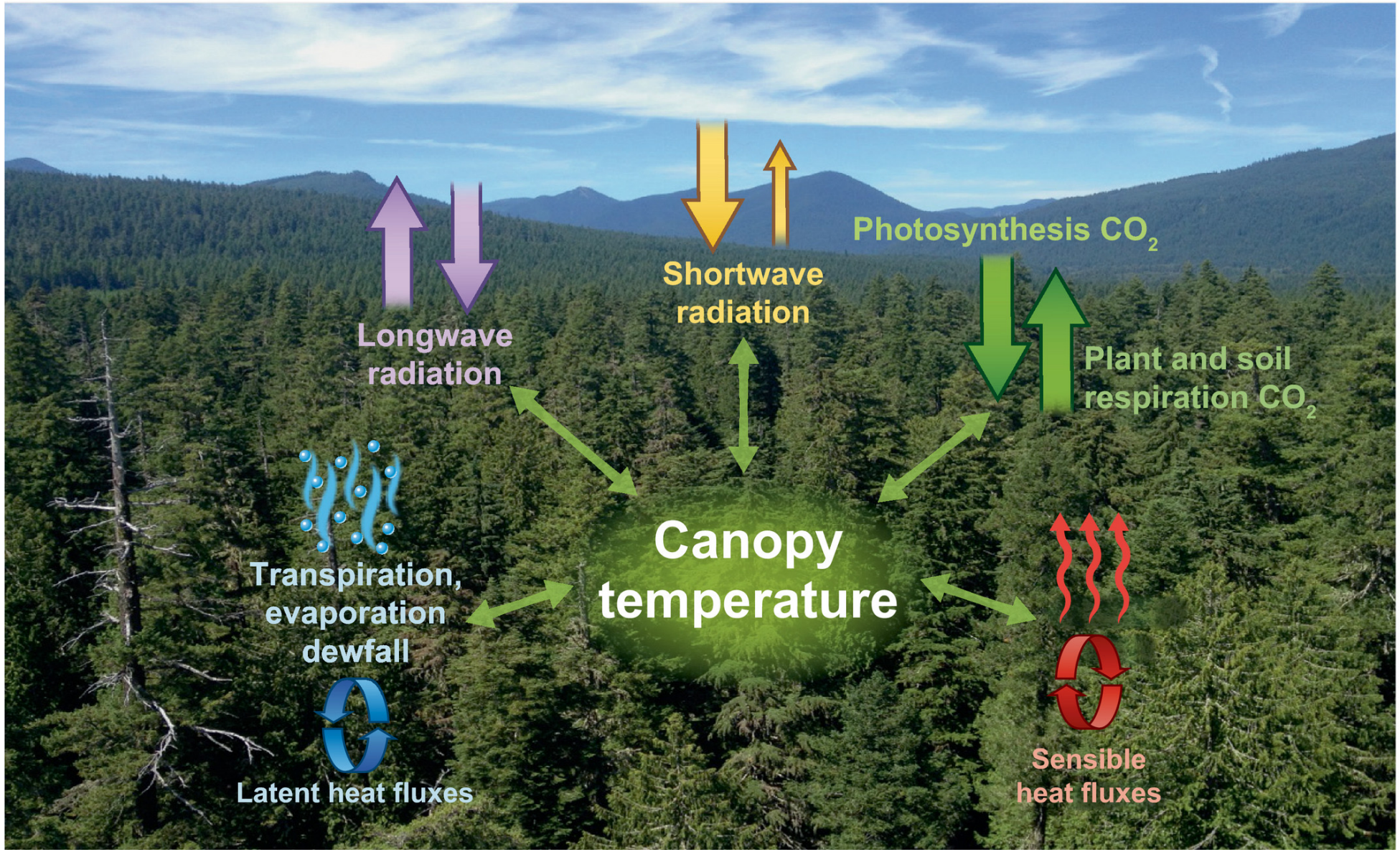
EcoStress Images for Farmers

Wim Bastiaanssen
&
Robert Covell

The life of a farmer is one with tough decisions

Canopy temperature is crucial, but requires advanced interpretation (modelling)



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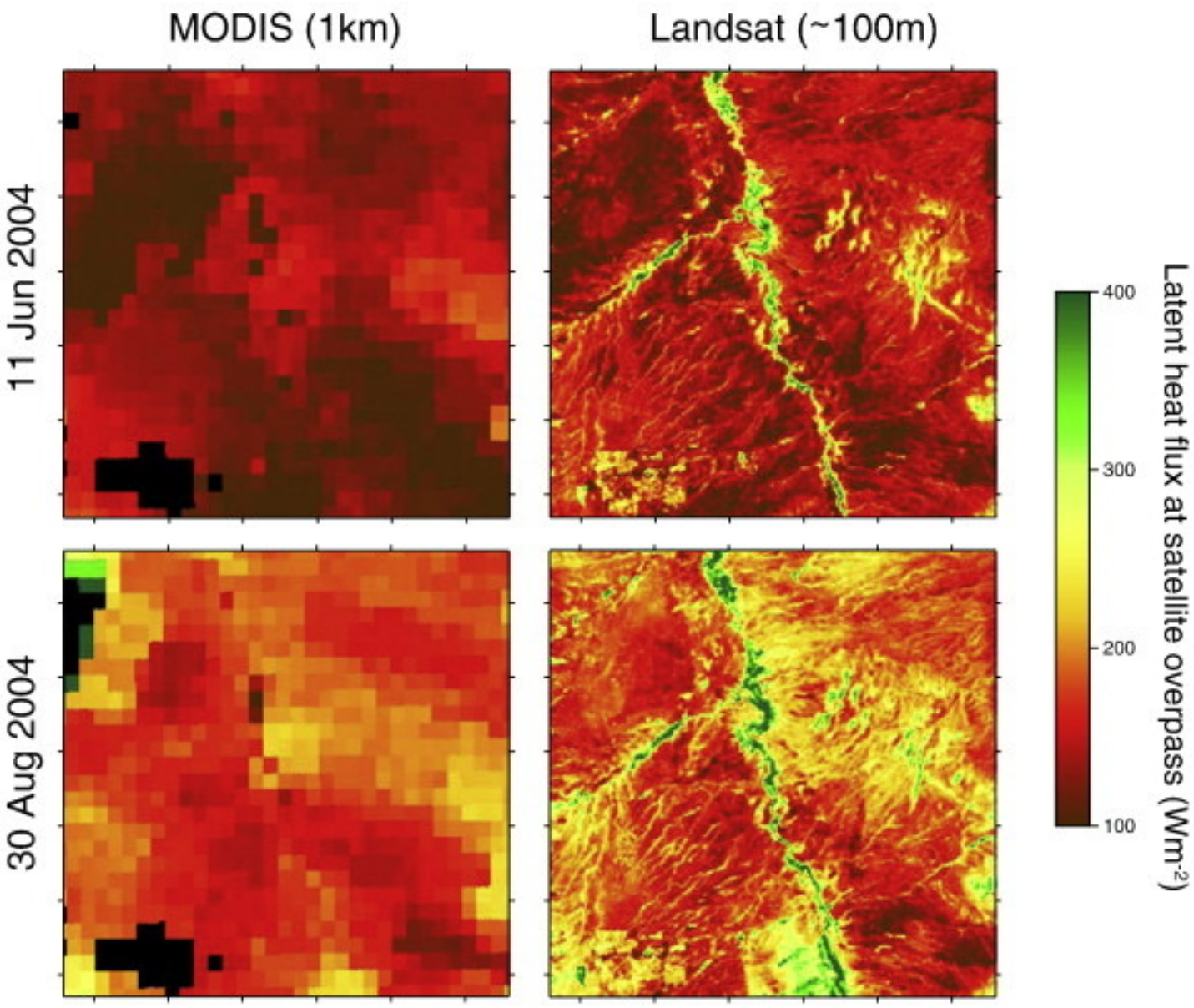
Thermal sharpening is part of the modelling



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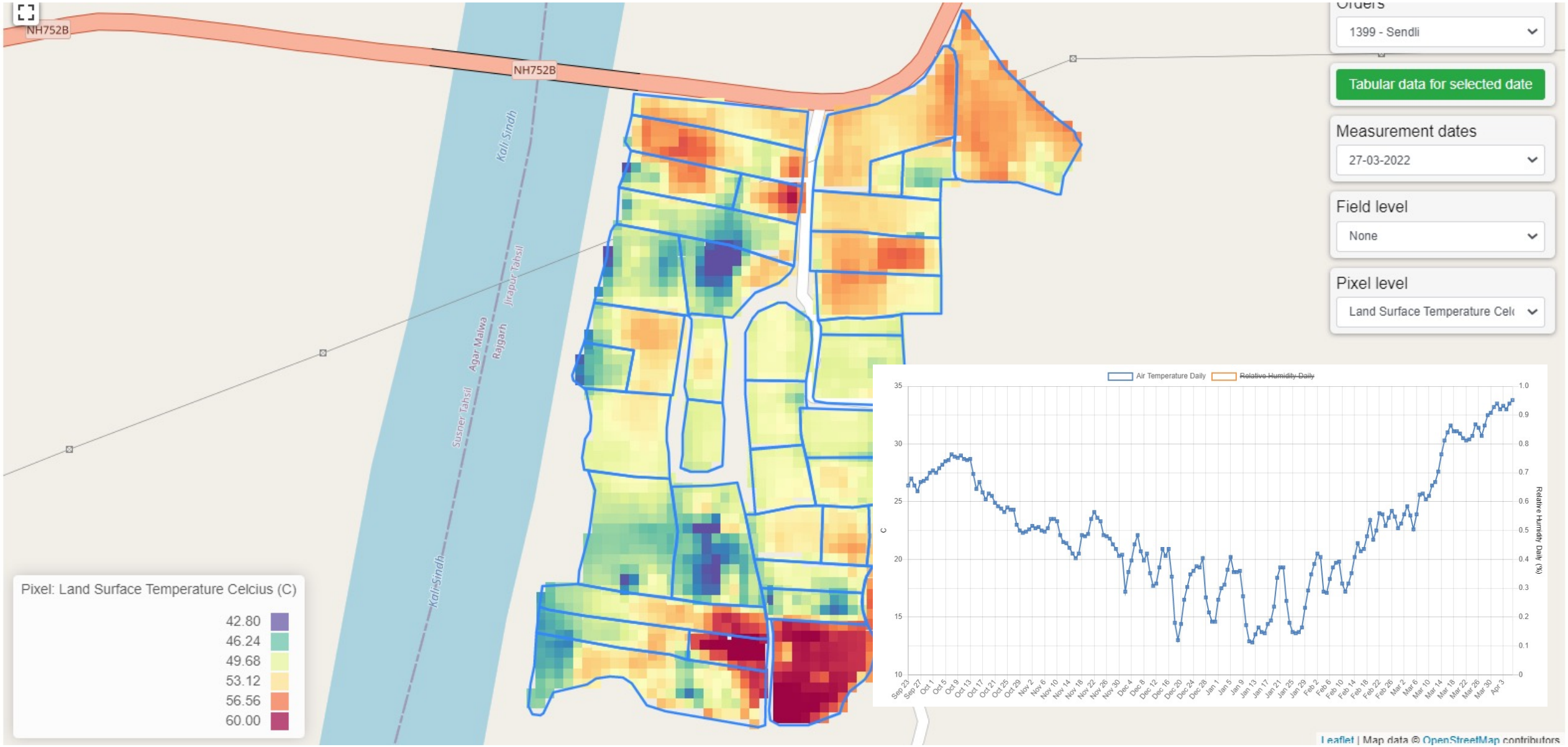
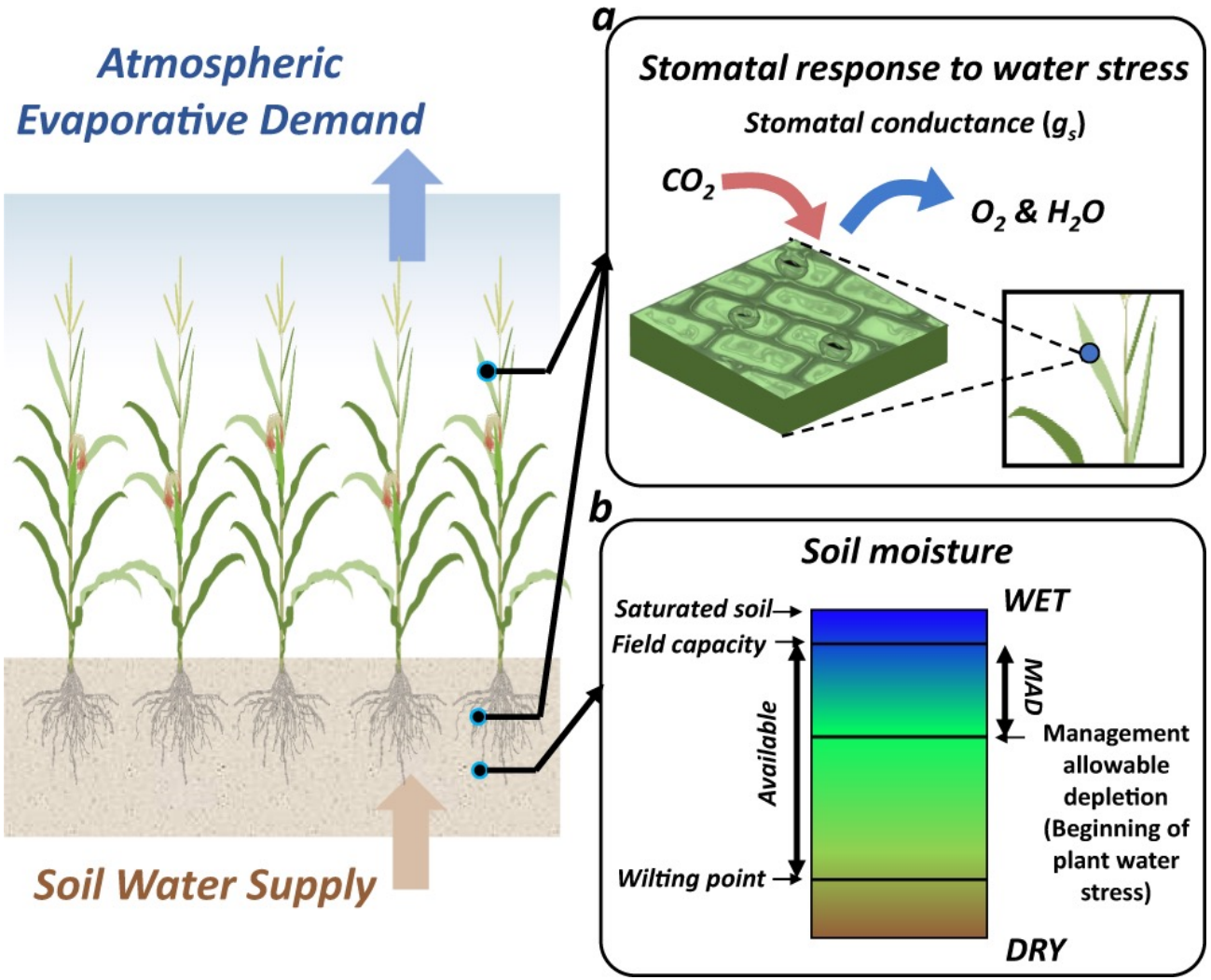
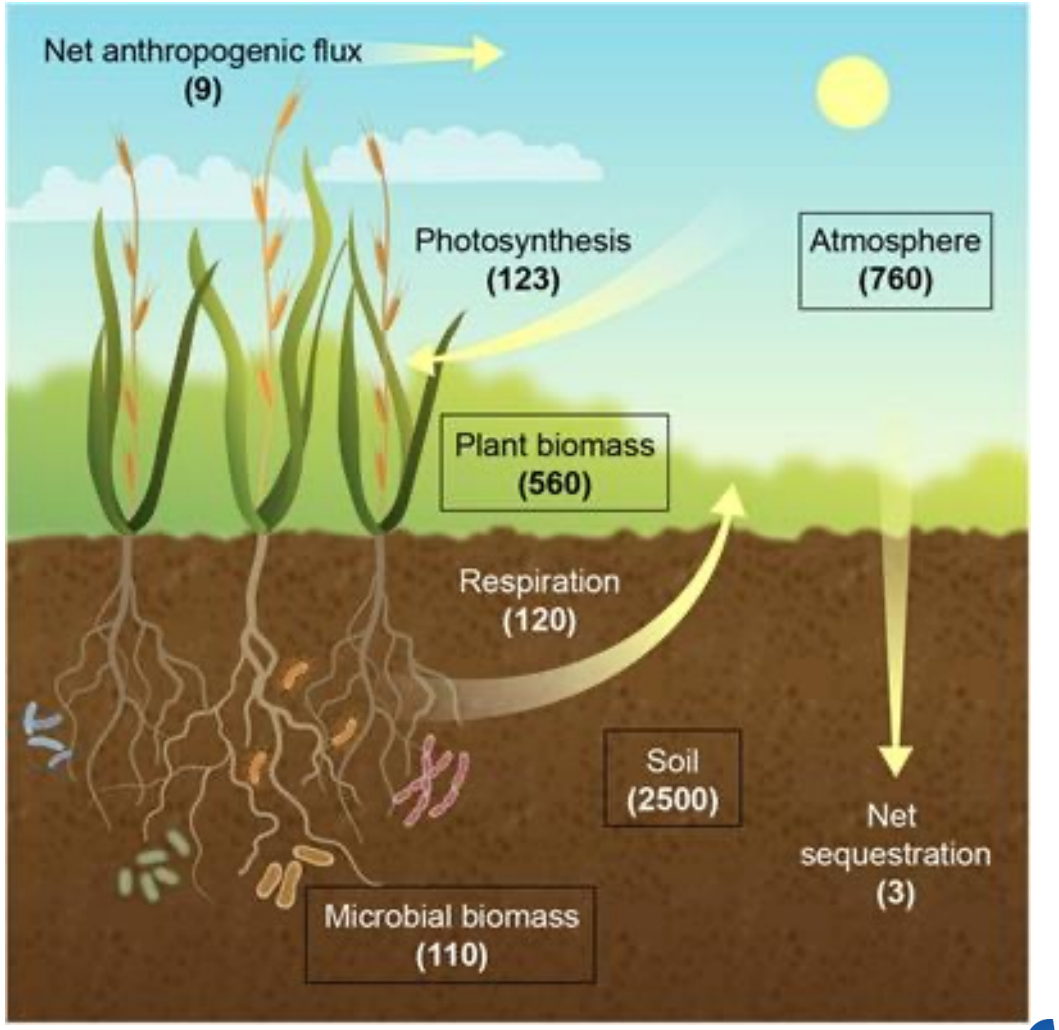
10 m land surface temperature Sendli 27 March (India)



Pixel Model for Soil Water Crop Atmosphere processes





SEBAL energy balance model

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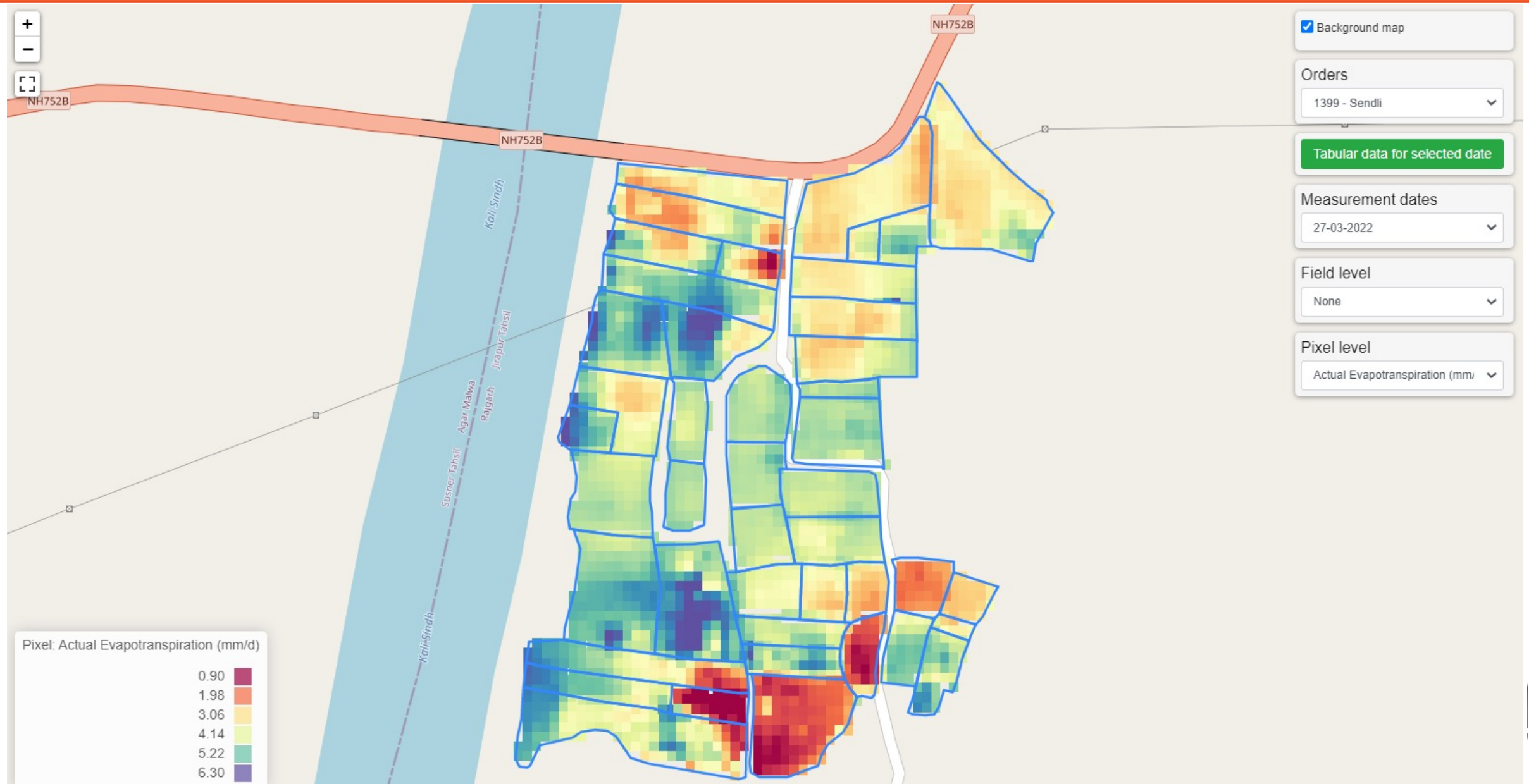
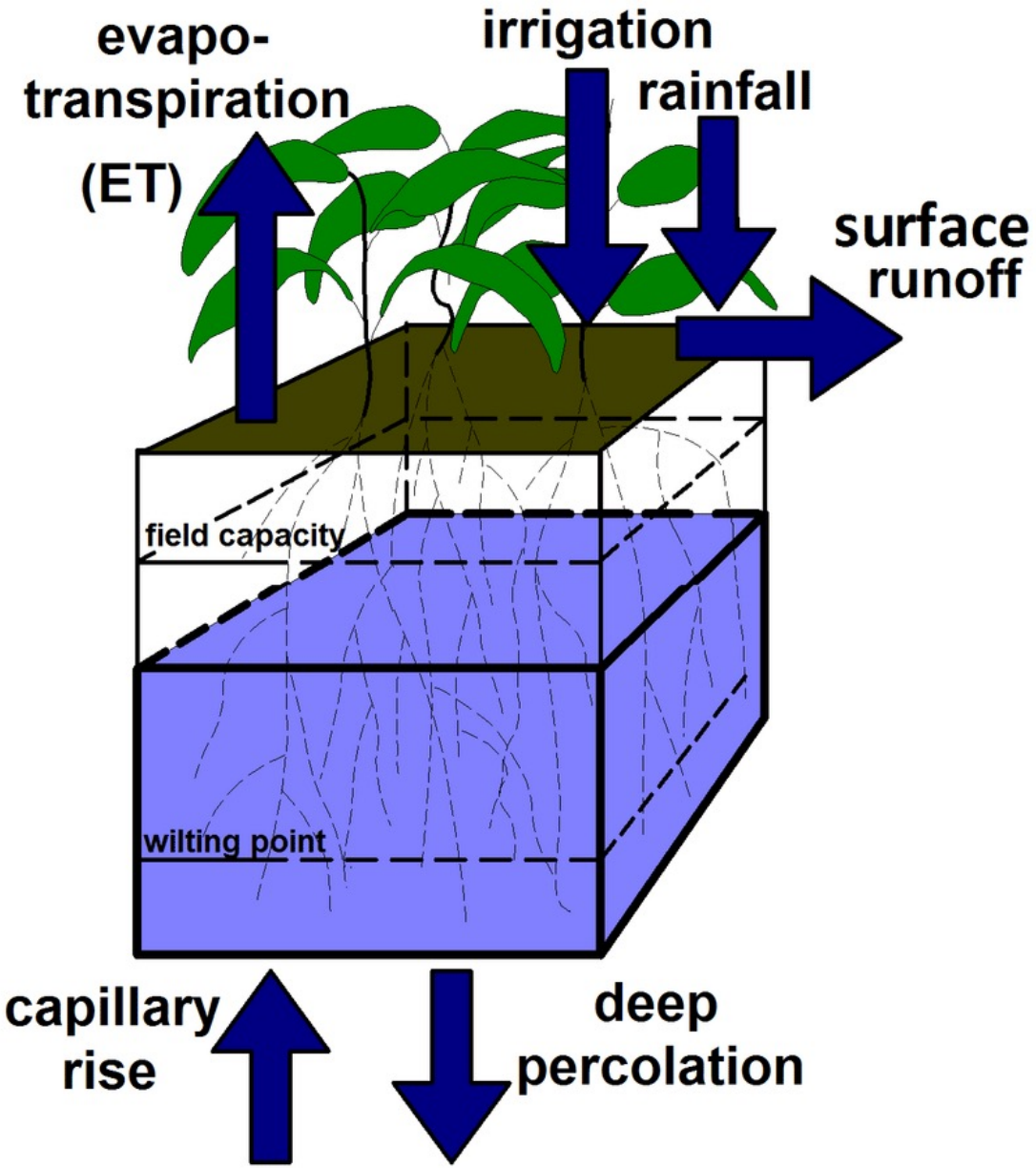
10 m crop evapotranspiration Sendli 27 March (India)



Checking field conditions India (last week)

10 m Soil Water Balance model for cloudy days



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Irrigation per sprinkler line

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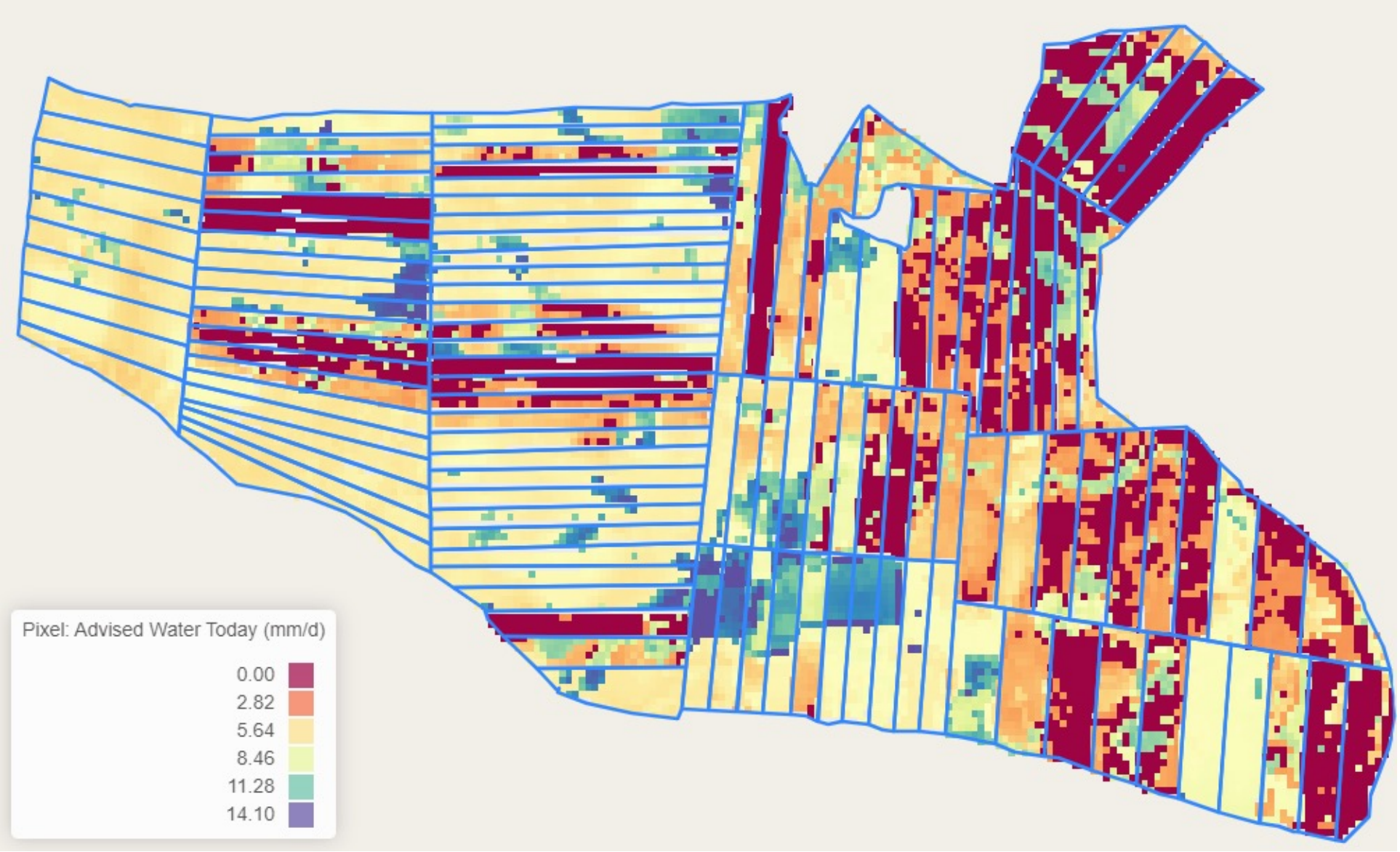
Irrigation advise per pixel



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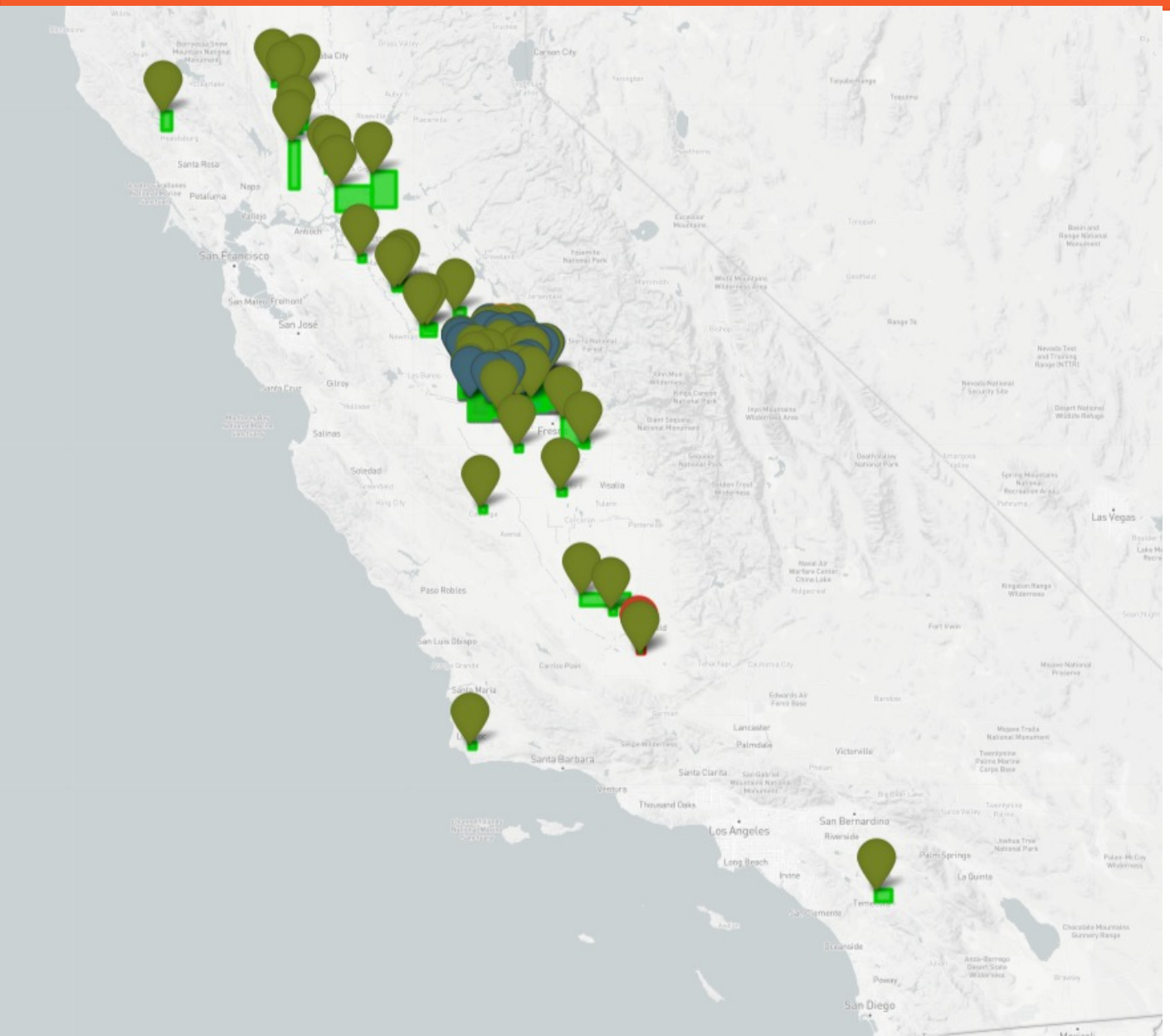
39 IrriWatch tiles in California (7 April 2022)



Region	No. of Tiles
California	39
Netherlands	38
India	35
Chili	21
Egypt	19
South Africa	16
Portugal	15
Mexico	12
Other	100
World TOTAL	324

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Number EcoStress images

- On 7 April 2022 we execute 324 tiles across the world
- On average 4 good quality Ecostress images / month (range 1 to 8 images)
- On average 48 good quality Ecostress images / year
- Total downloads 324 x 48 = 15,500 images / yr

EcoStress is essential to create operational thermal measurements

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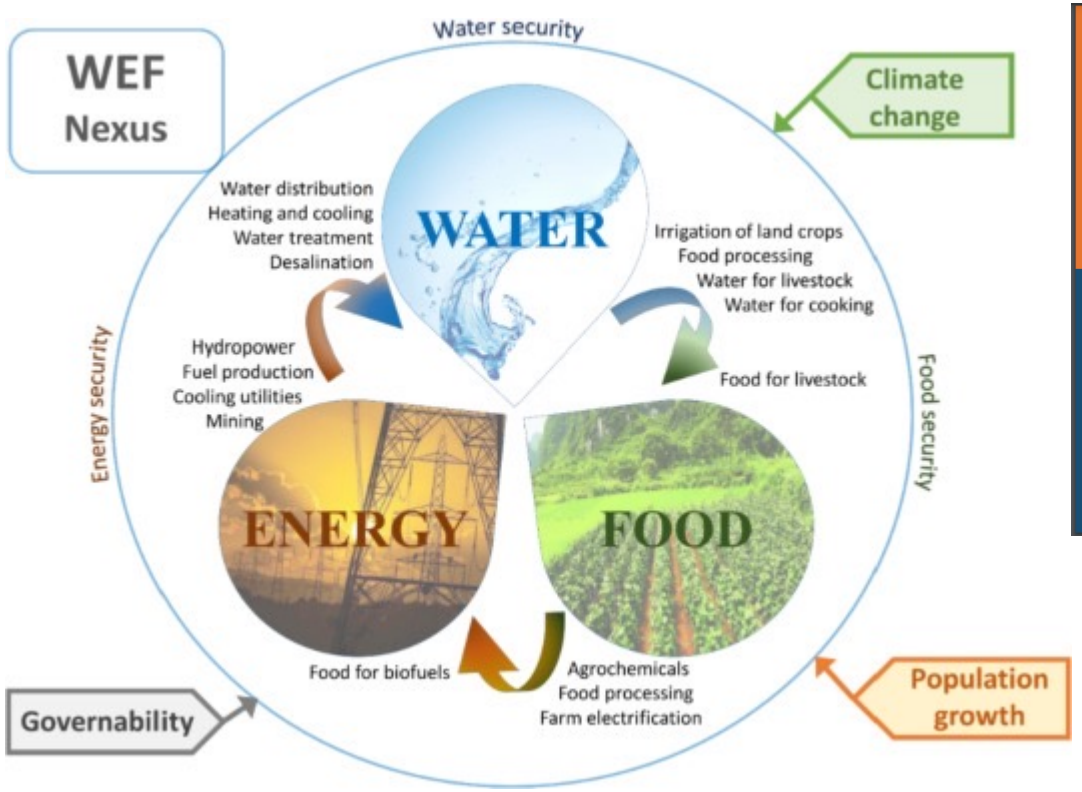
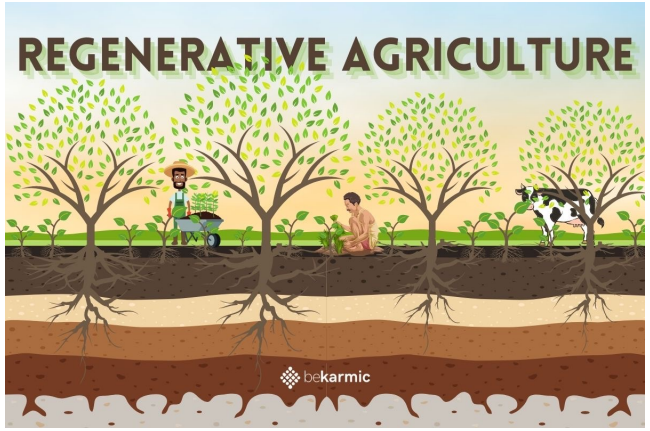
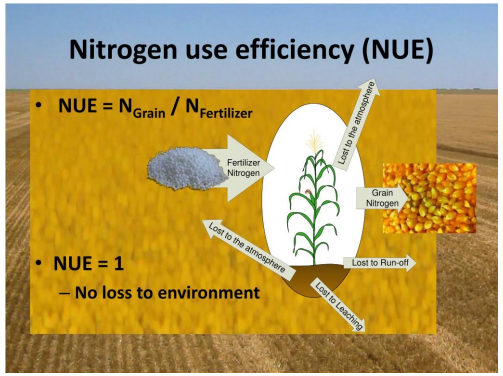
Practical usage of EcoStress measurements for crops

Pressure on International Agriculture to perform better

MORE CROP PER DROP™







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Digital Agricultural Portals appear as mushrooms

SMART AGRI HUBS

Q: What is the source of precision agricultural data (sensors and drones are insufficient) ?

A: It has to be a 2D image with sufficient spatial resolution, how do you measure your crop otherwise ?

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EcoStress helps farmers on following information:

- When does the crop need water ? → Soil water potential
- How much water does the crop consume ? → Actual evapotranspiration
- Where should I irrigate? → Variable Rate Irrigation
- What is crop (heat and water) stress ? → Dry Matter Production (DMP)
- Alerts on local pest & diseases → Pockets with DMP changes
- When and amount of fertilizers → Leaf Nitrogen
- Maintaining & increasing soil health → Soil carbon pools

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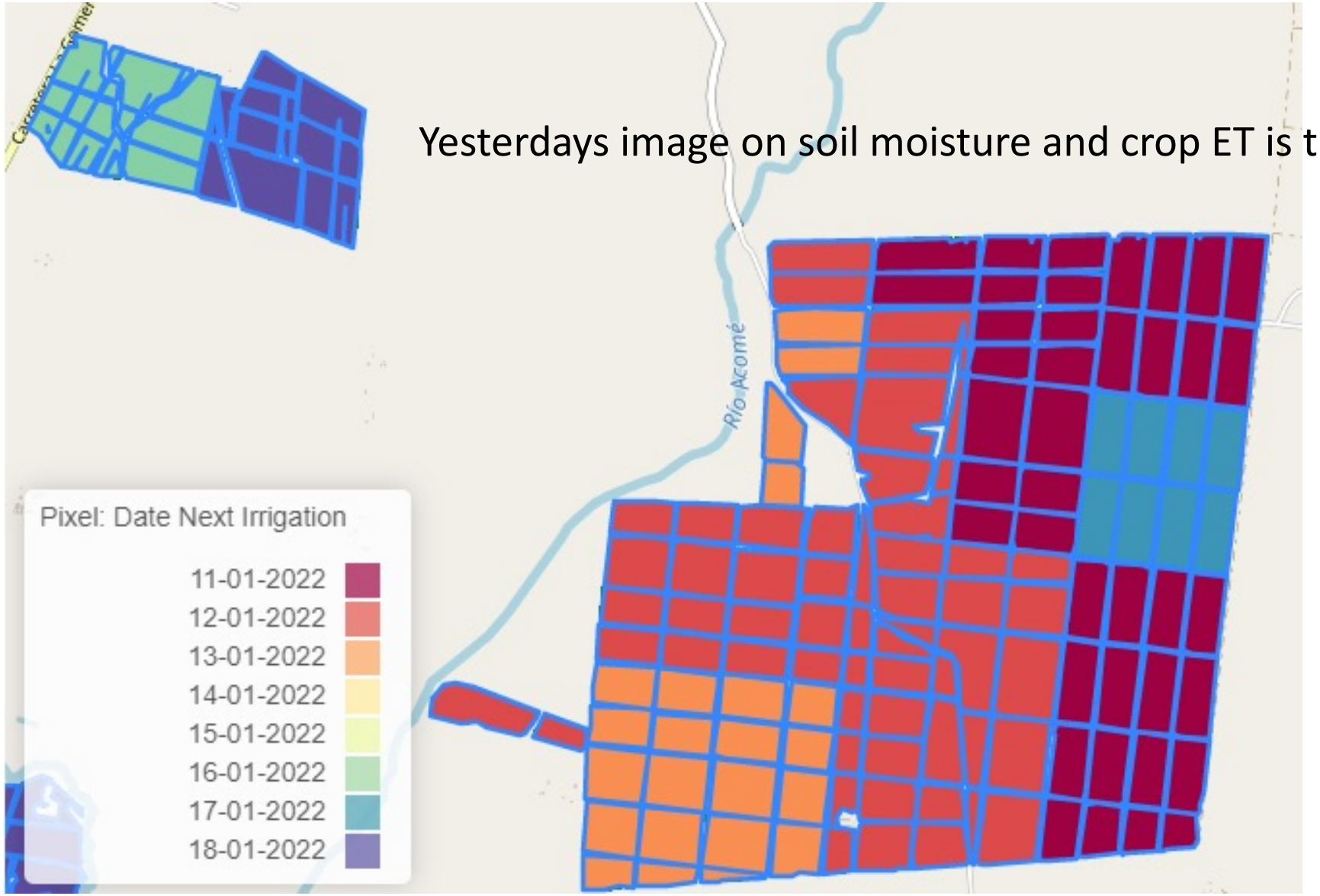
Irrigation requires a weekly plan

Yesterdays image on soil moisture and crop ET is the basis for forecasts



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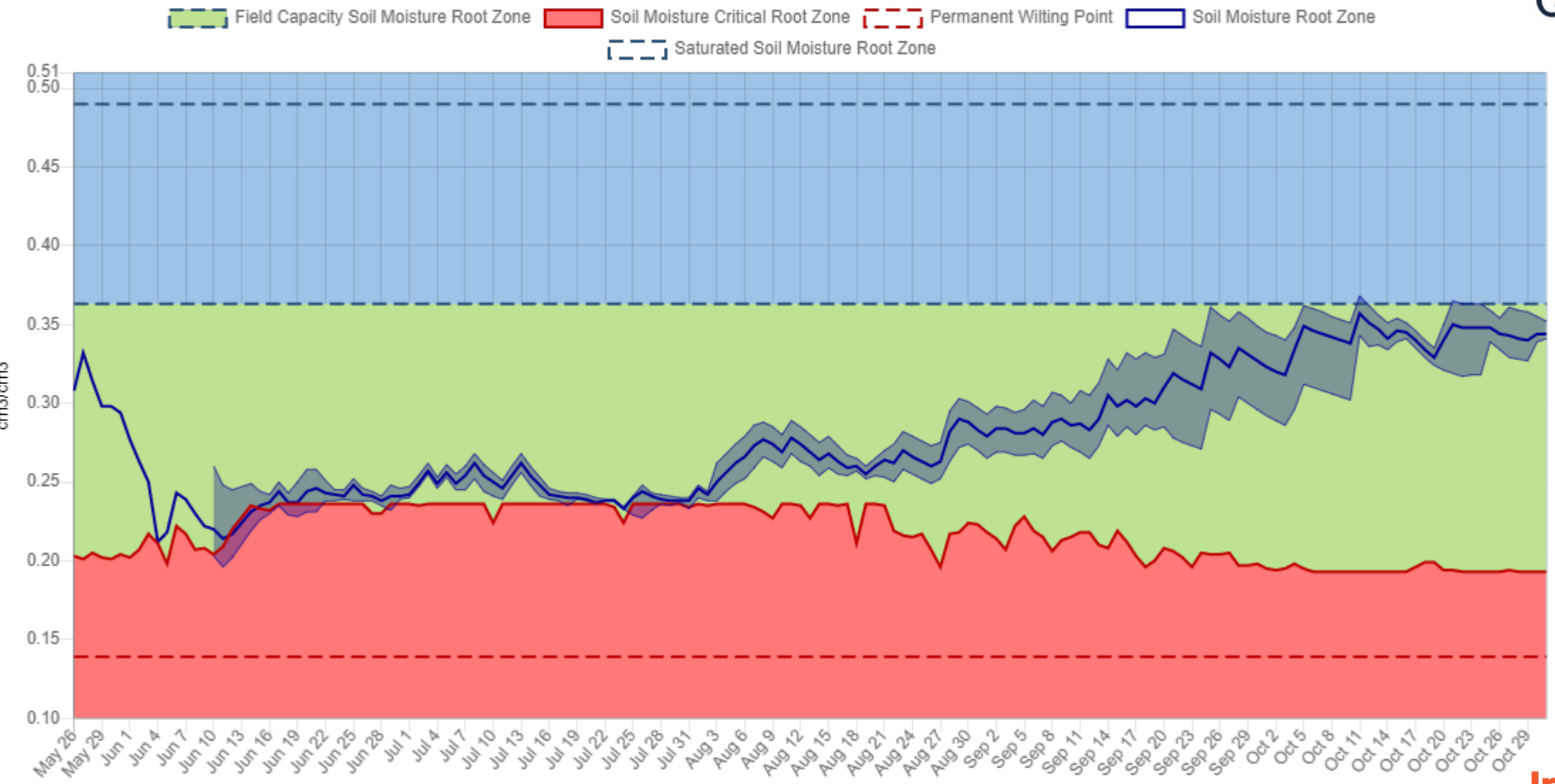
Less irrigations in Kazakhstan

QYZYLSHA



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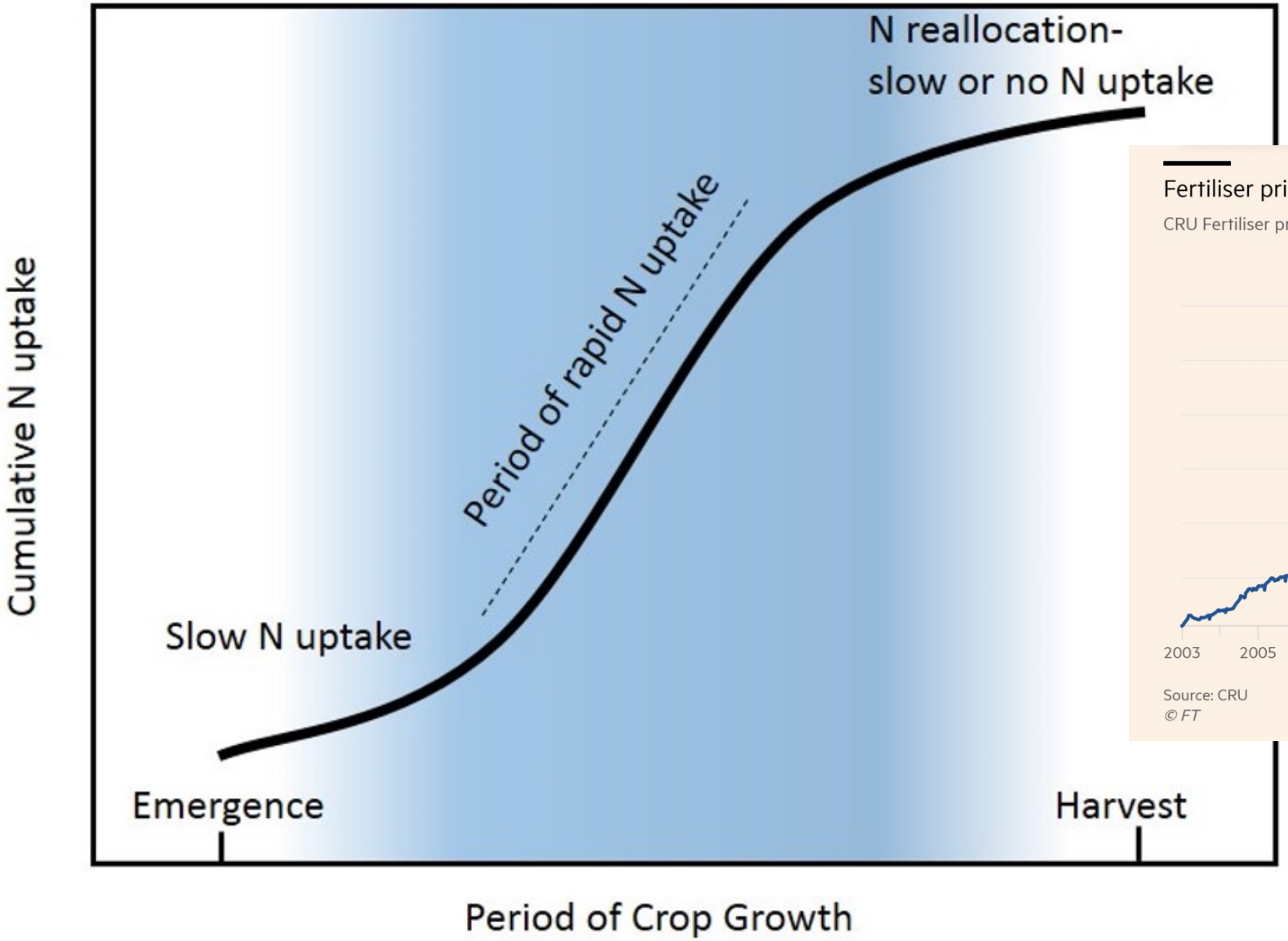
Only apply Nitrogen when there is sufficient moisture



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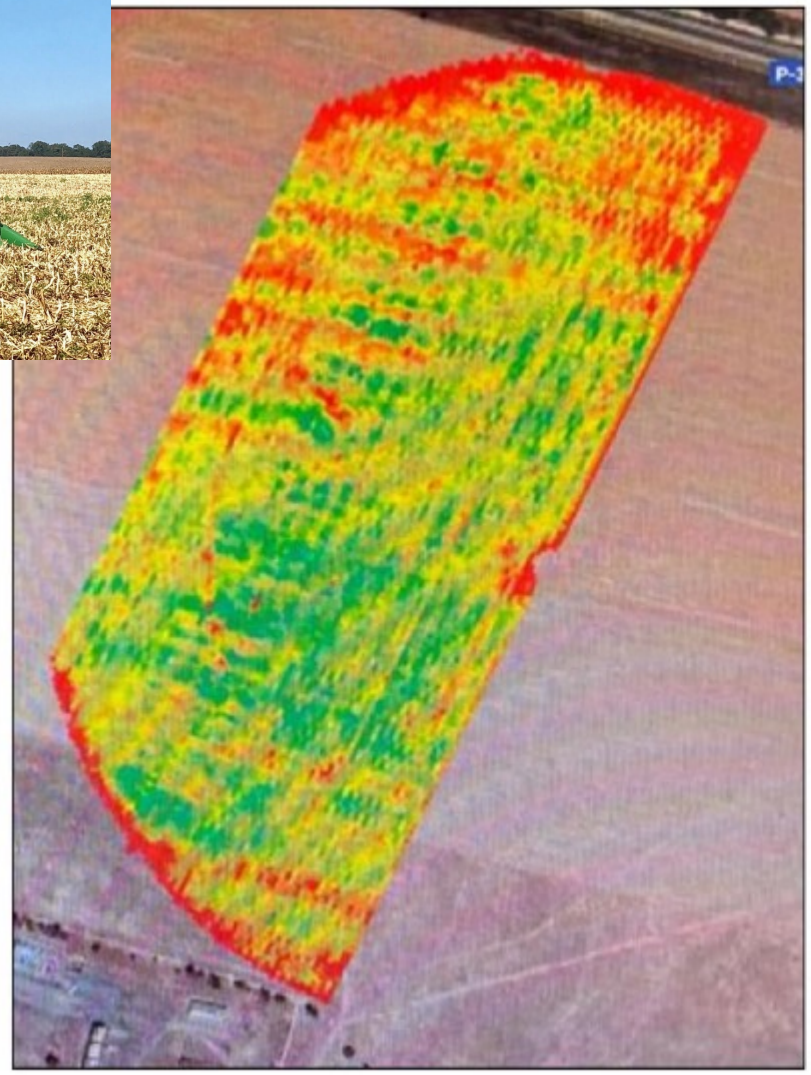
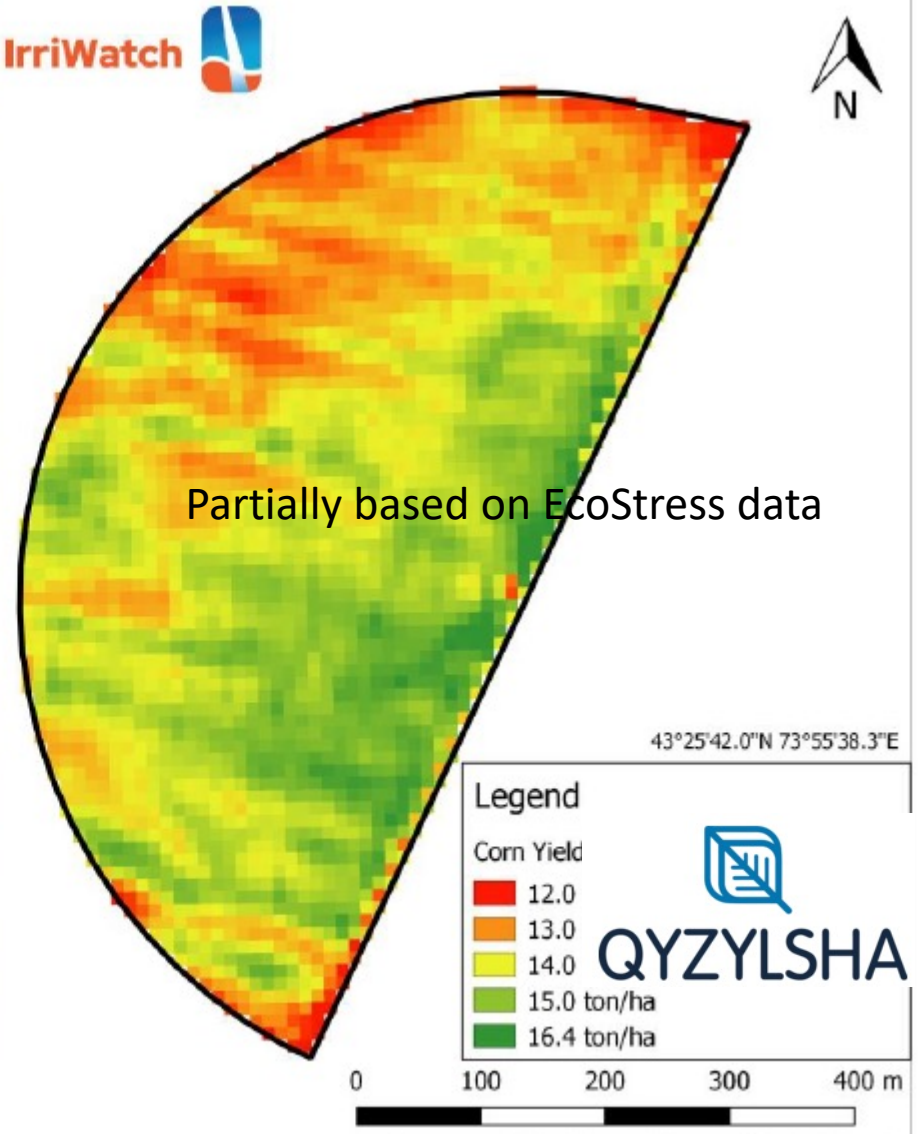
Maize production 10 m x 10 m , Kazakhstan

Combine-harvester data





Source: www.irriwatch.com (E: support@irriwatch.com)

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