ACCWA

Accounting for Climate Change in Water and Agriculture management

H2020-MSCA-RISE-2018, 2019- 2024

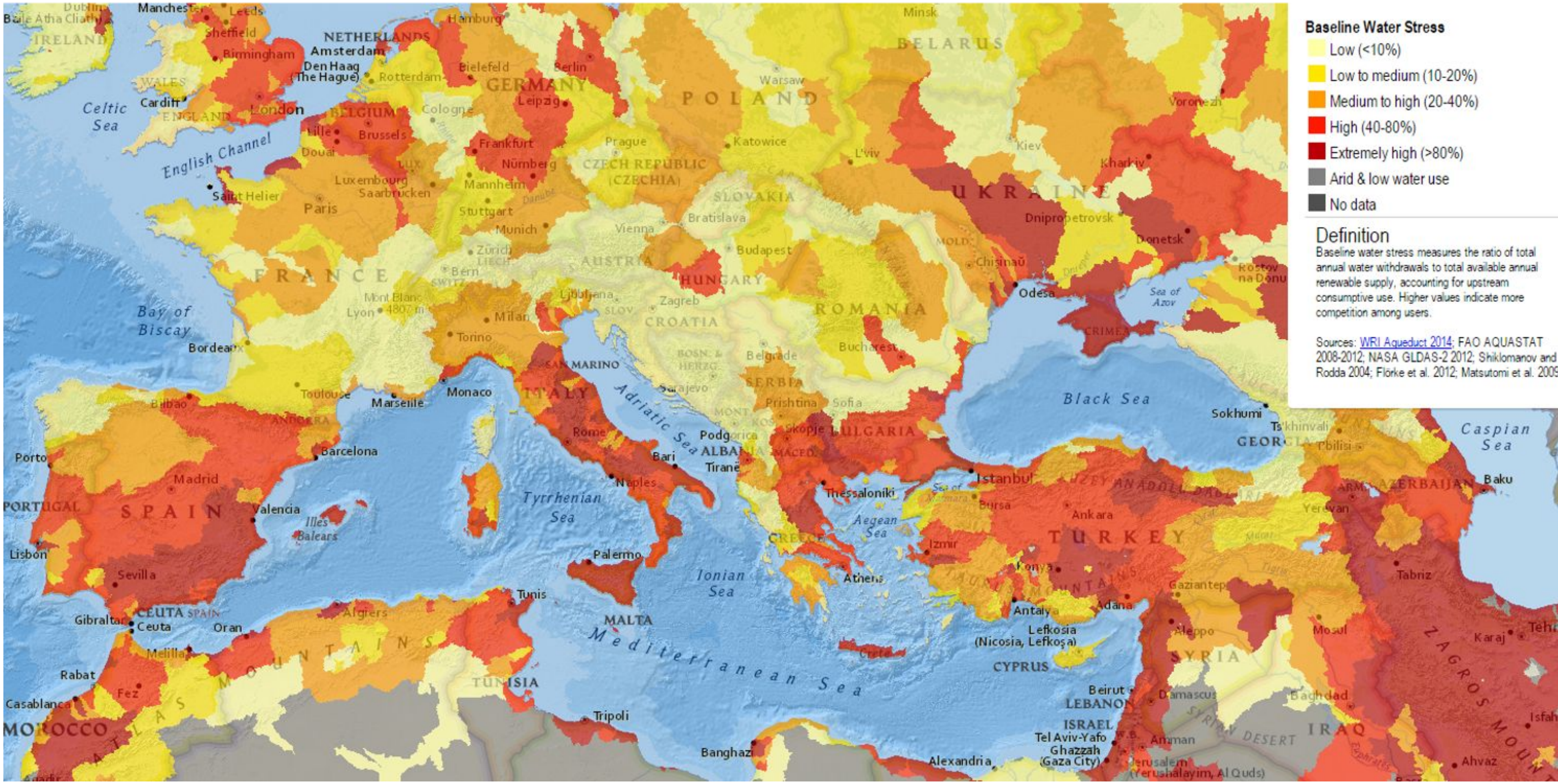
Grant agreement no: 823965

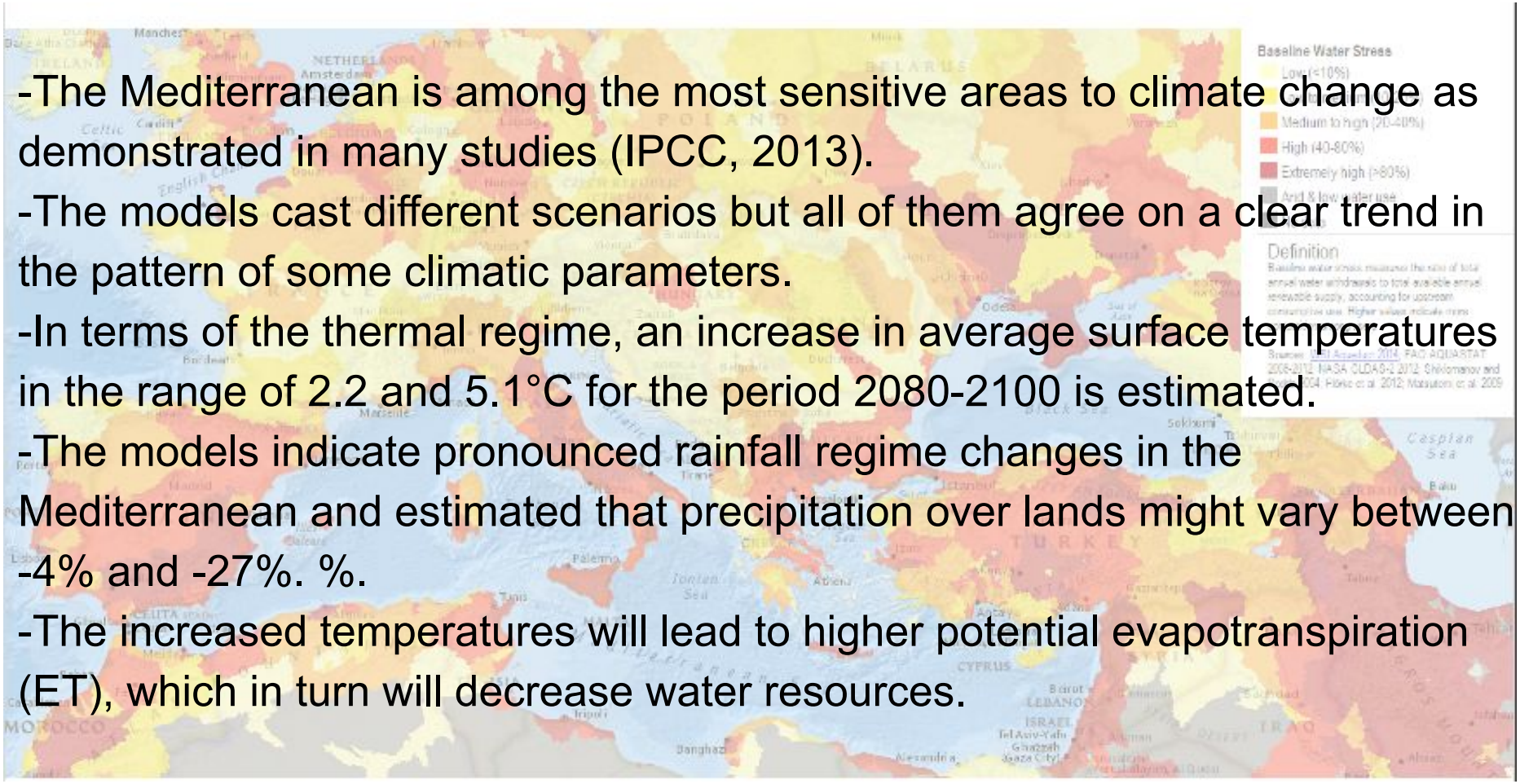
Open Project Day

isardSAT, Barcelona | March 11th, 2022

Marie Curie Actions

HORIZON 2020


Baseline Water Stress
Low (<10%)
Low to medium (10-20%)
Medium to high (20-40%)
High (40-80%)
Extremely high (>80%)
Arid & low water use
No data
Definition
Baseline water stress measures the ratio of total annual water withdrawals to total available annual renewable supply, accounting for upstream consumptive use. Higher values indicate more competition among users.
Sources: WRI Aqueduct 2014; FAO AQUASTAT 2008-2012; NASA GLDAS-2 2012; Shiklomanov and Rodda 2004; Flörke et al. 2012; Matsutomi et al. 2009



-The Mediterranean is among the most sensitive areas to climate change as demonstrated in many studies (IPCC, 2013).

-The models cast different scenarios but all of them agree on a clear trend in the pattern of some climatic parameters.

-In terms of the thermal regime, an increase in average surface temperatures in the range of 2.2 and 5.1°C for the period 2080-2100 is estimated.

-The models indicate pronounced rainfall regime changes in the Mediterranean and estimated that precipitation over lands might vary between -4% and -27%. %.

-The increased temperatures will lead to higher potential evapotranspiration (ET), which in turn will decrease water resources.

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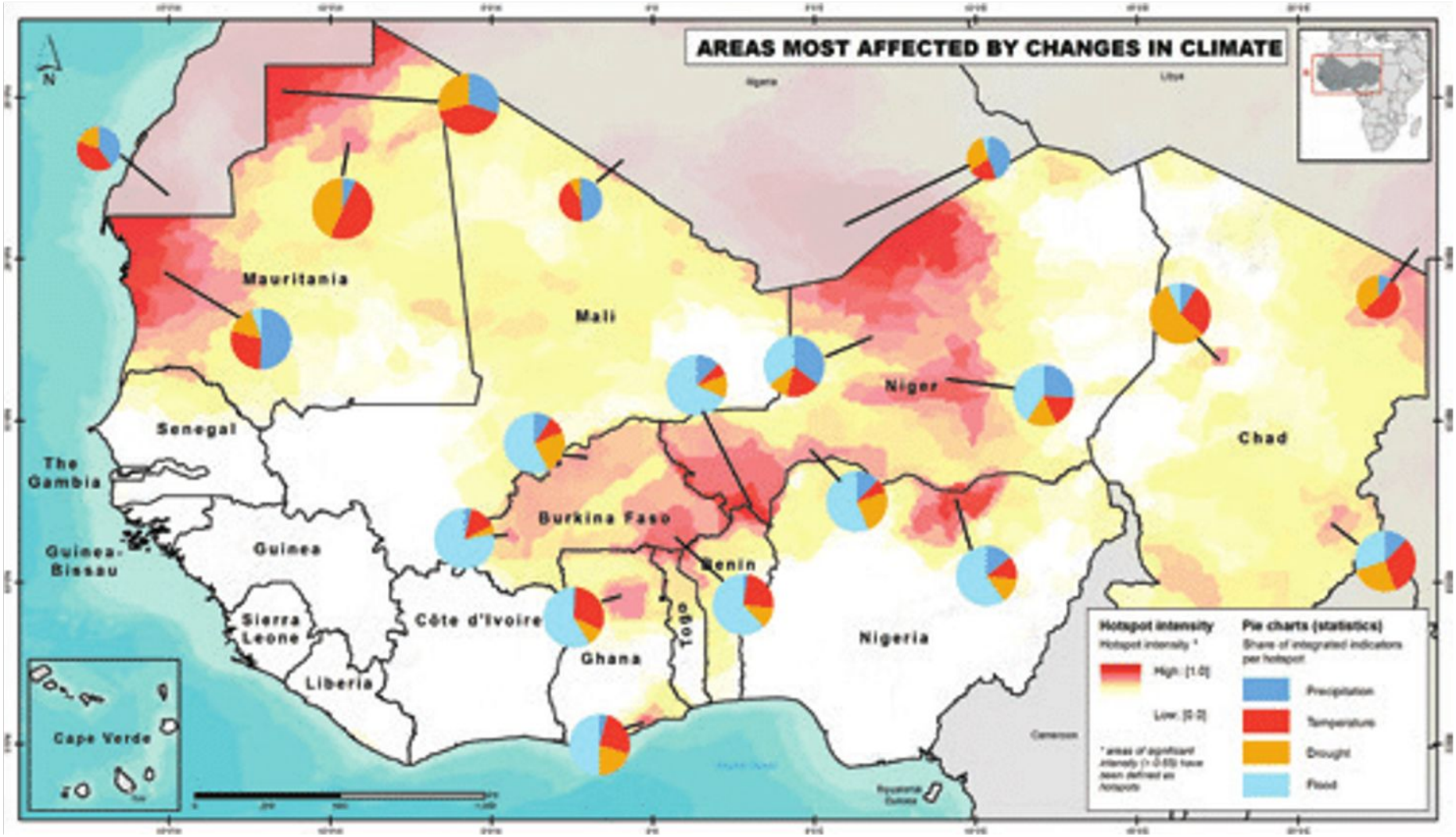
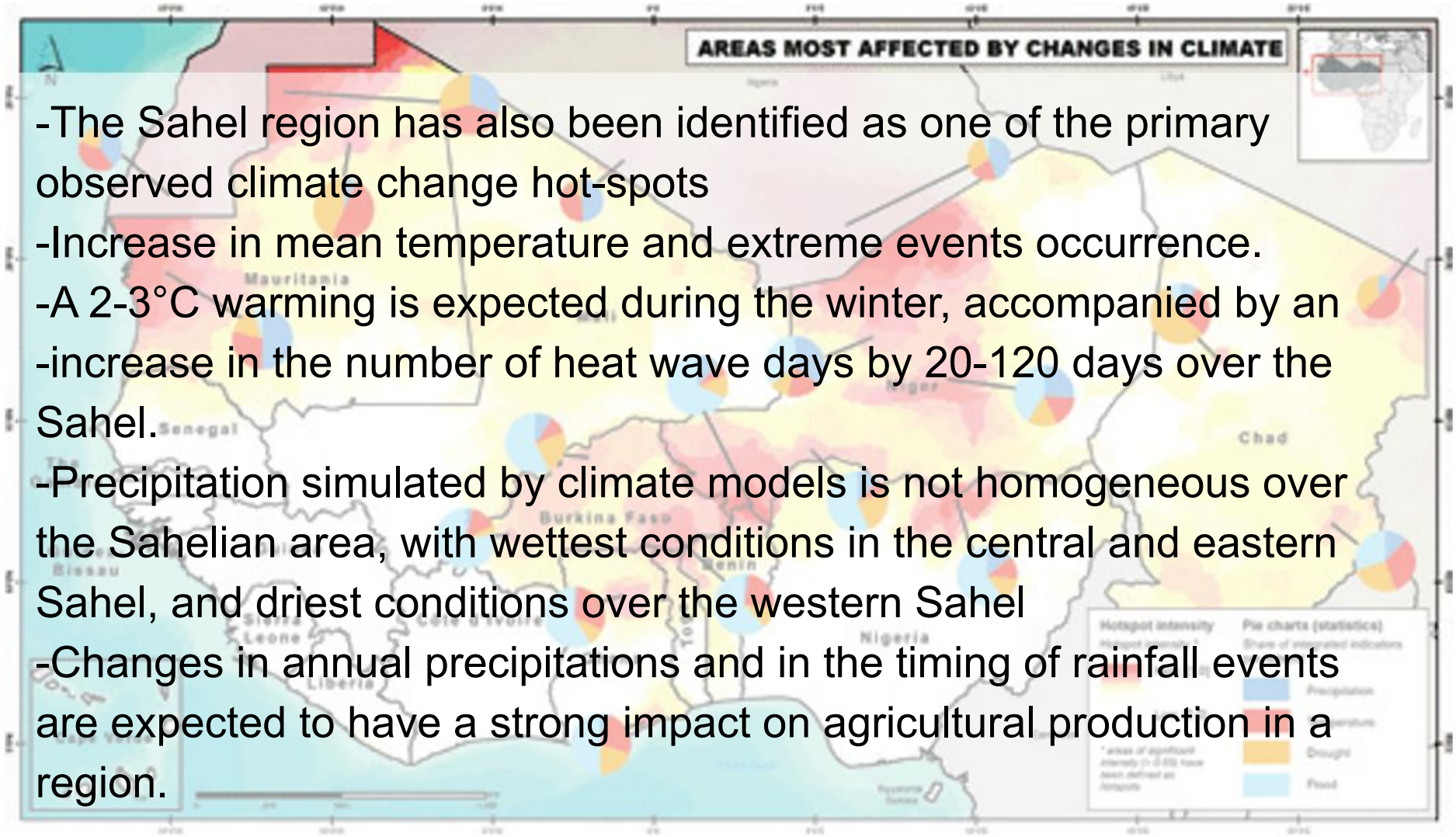

AREAS MOST AFFECTED BY CHANGES IN CLIMATE
Mauritania
Mali
Niger
Chad
Senegal
The Gambia
Guinea-Bissau
Guinea
Burkina Faso
Benin
Sierra Leone
Côte d'Ivoire
Ghana
Togo
Liberia
Nigeria
Cape Verde
Hotspot intensity
Pie charts (statistics)
Precipitation
Temperature
Drought
Flood



-The Sahel region has also been identified as one of the primary observed climate change hot-spots

-Increase in mean temperature and extreme events occurrence.

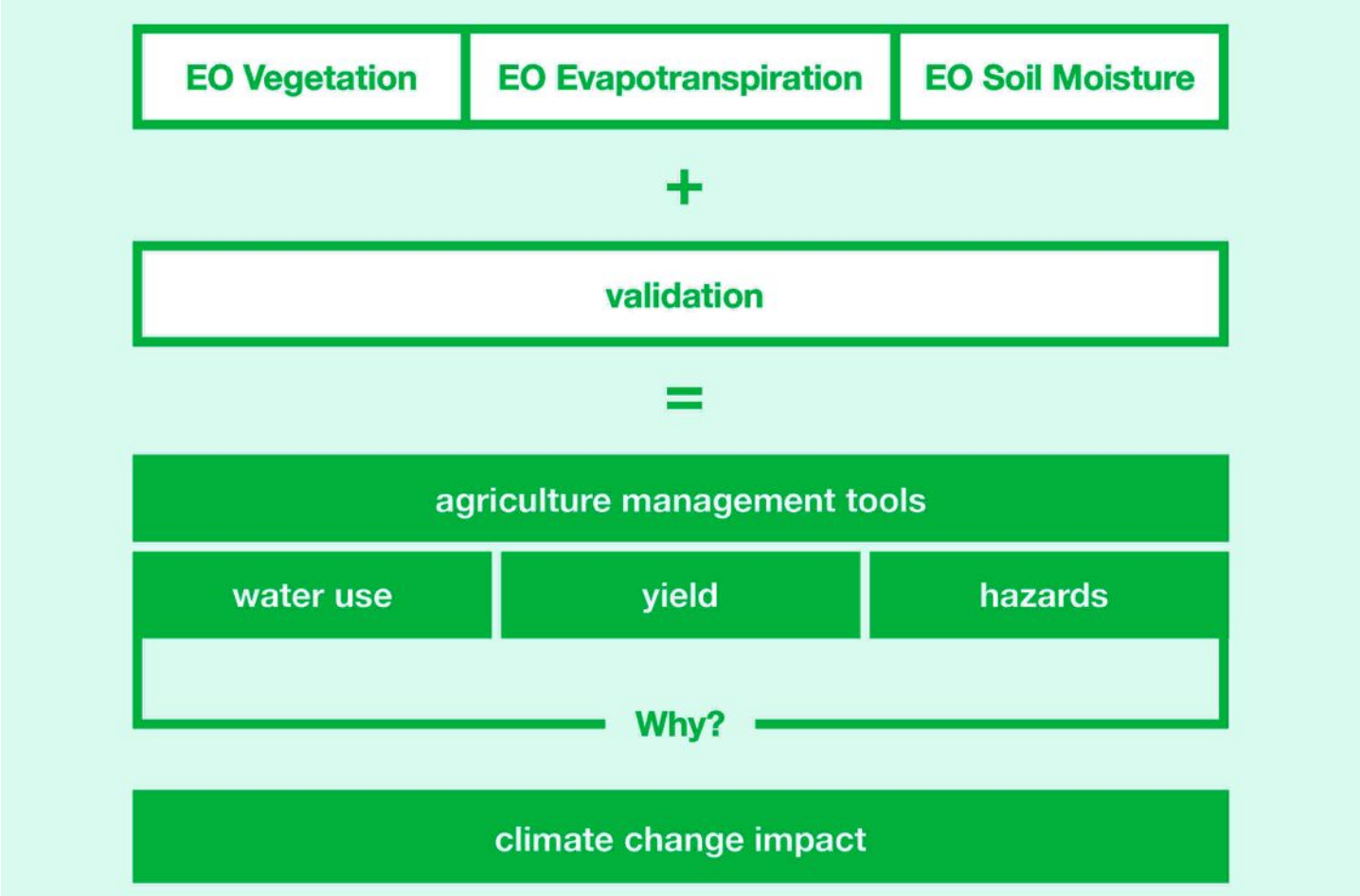
-A 2-3°C warming is expected during the winter, accompanied by an

-increase in the number of heat wave days by 20-120 days over the Sahel.

-Precipitation simulated by climate models is not homogeneous over the Sahelian area, with wettest conditions in the central and eastern Sahel, and driest conditions over the western Sahel

-Changes in annual precipitations and in the timing of rainfall events are expected to have a strong impact on agricultural production in a region.

Objectives



ACCWA aims to develop the remote sensing based management and monitoring tools for food security and water & agricultural risk management that allow improving the reliability of decision making regarding water use, yield and hazards in agriculture.

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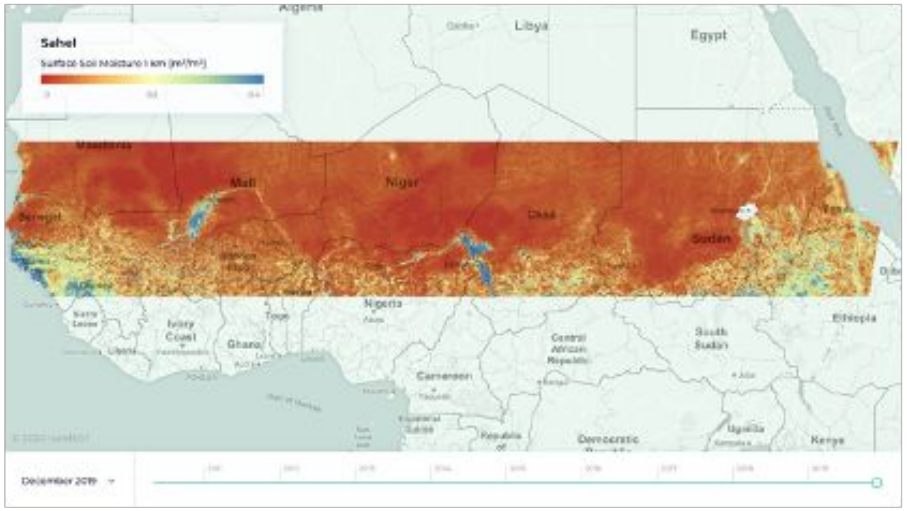
isardSAT®

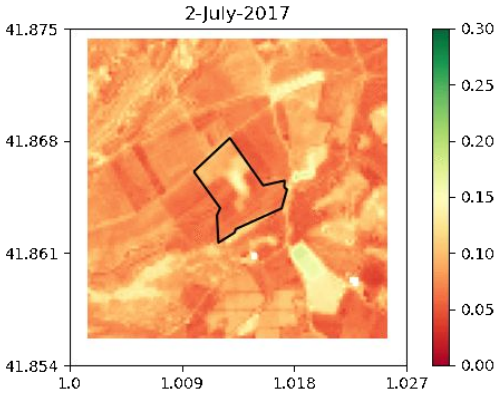
- Continuous improvement SM 1km product (SMOS/SMAP, MODIS/S3)
- RZSM 1km

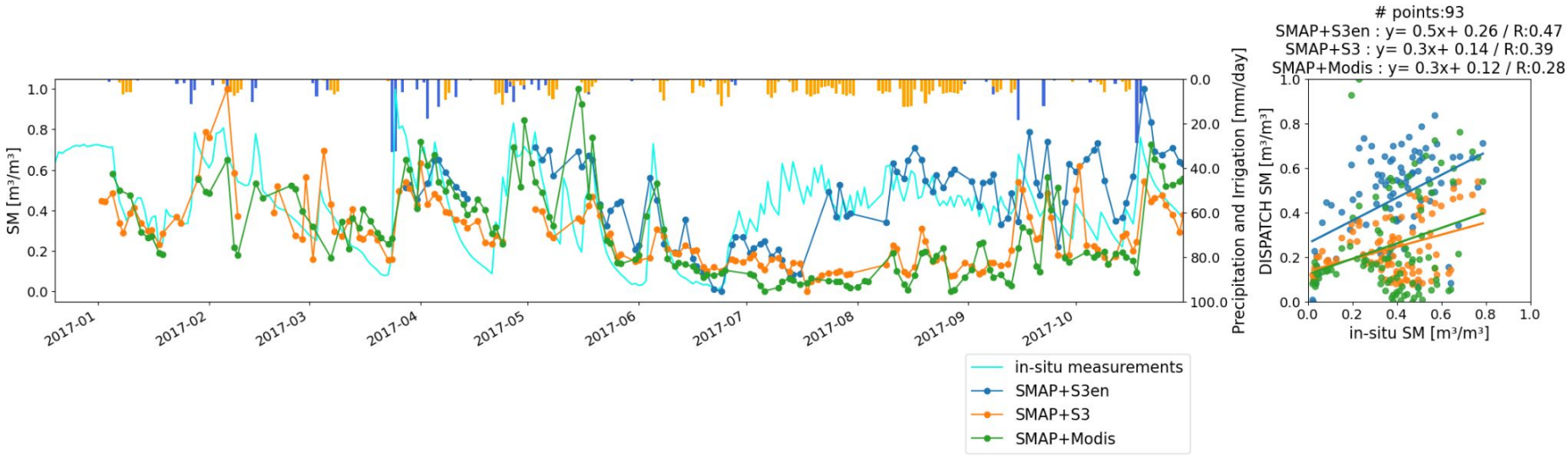
Data	From surface to root-zone soil moisture derived from L-band MW
Temporal coverage	since 2010
Spatial coverage	Global
Temporal resolution	every 1/2 days
Spatial resolution	1 km
Delivery	WMS, FTP, direct download



High resolution soil moisture, disaggregation with SMOS/SMAP in combination with thermal/optical data S3/MODIS (Merlin et al. 2013, Stefan et al. 2021)

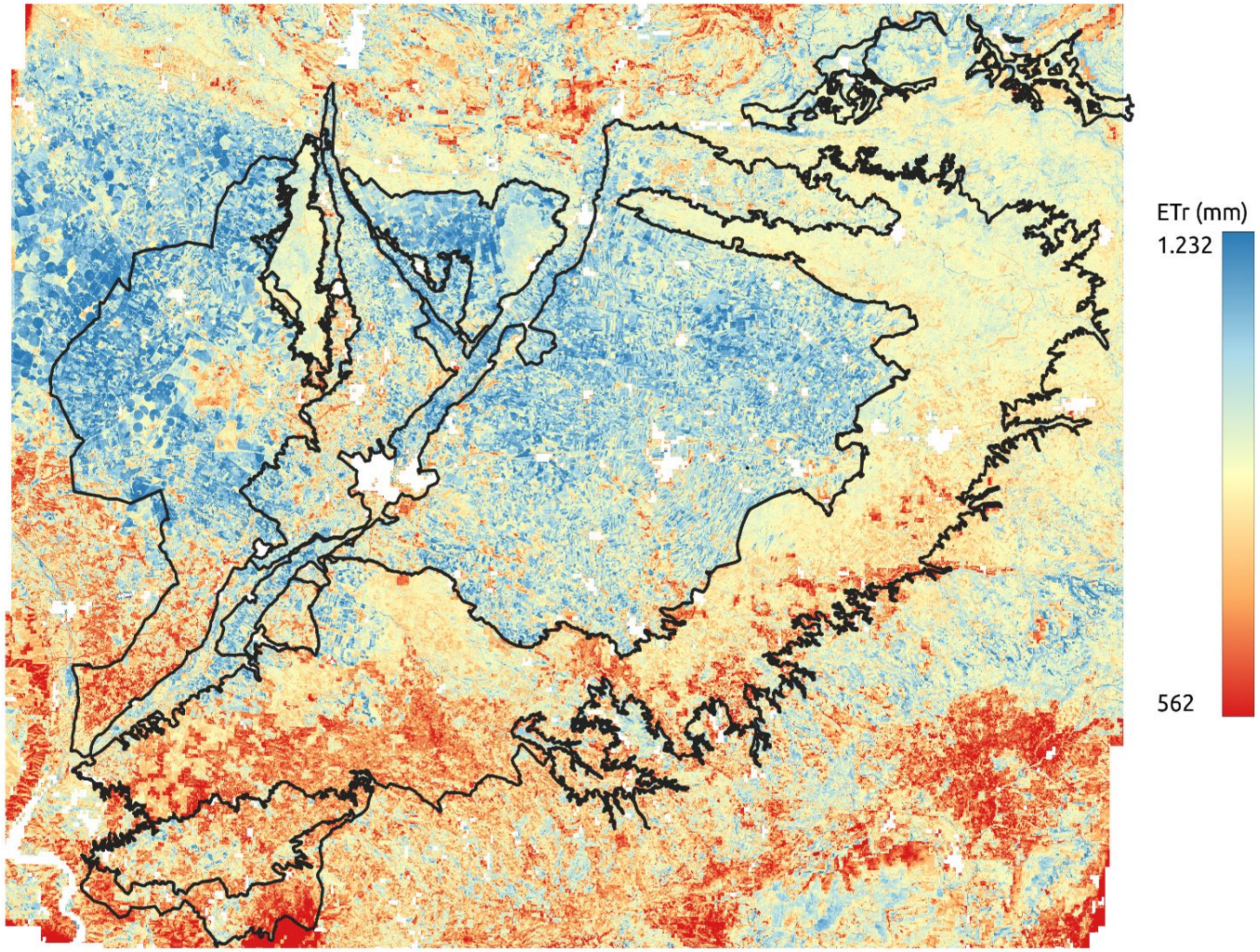
- **SM at field scale from SMAP S3/S2**



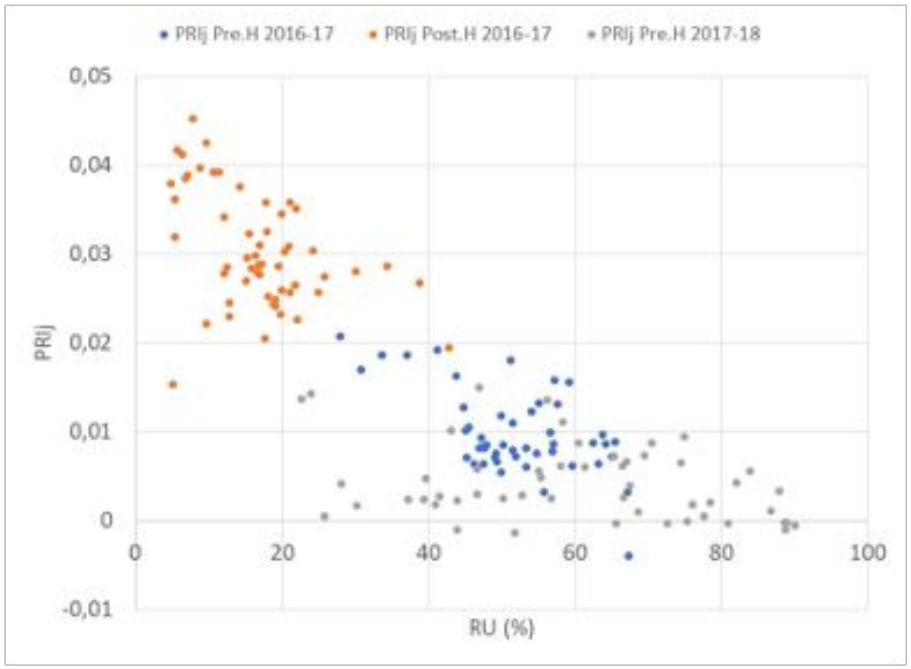


Paolini et al. Disaggregation of SMAP Soil Moisture at 20 m resolution: Validation and sub-field scale analysis *submitted remote sensing*

ET based on S3/S2 synergy



Using the photochemical reflectance index (PRI) to detect the water stress of winter wheat in semi-arid regions

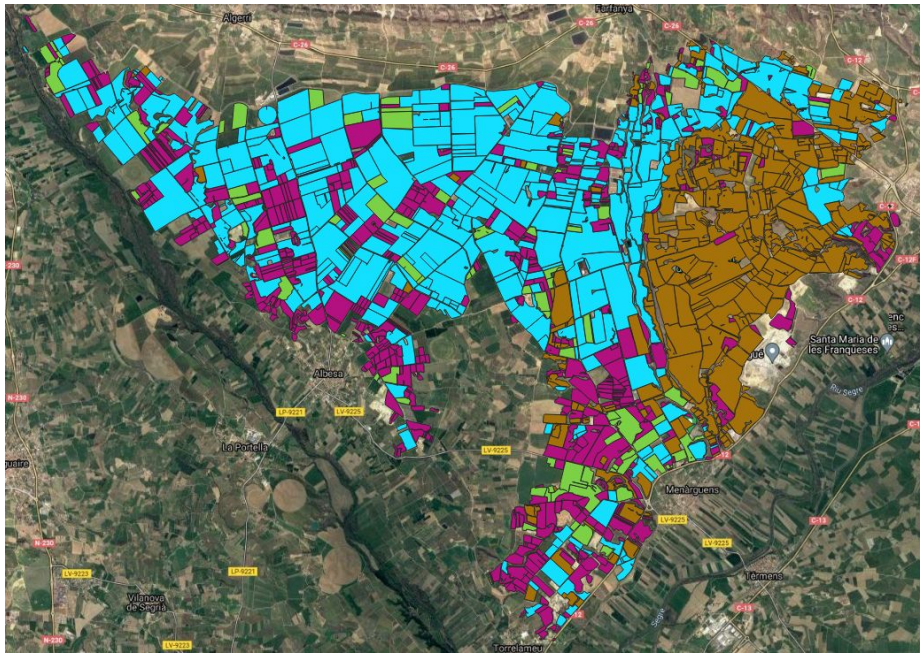


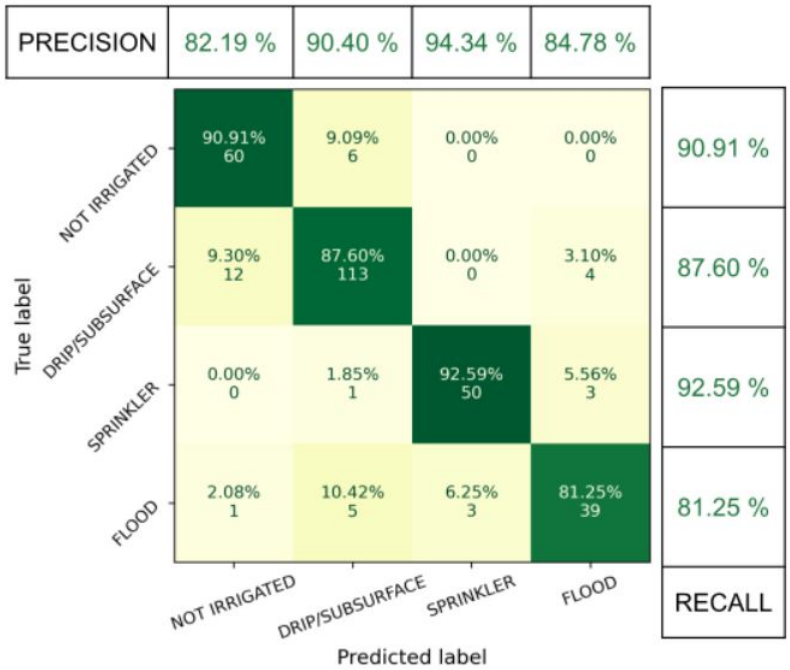
Correlation between the PRIj and the RU (extractable soil water) in the soil during the 2016-17 season and before heading (Pre H) for the 2017-18 season..

PRIj decrease according to the increase in soil water availability.

PRIj can provide us with information on the water status of wheat

Water Use





Paolini et al. *to be submitted remote sensing*

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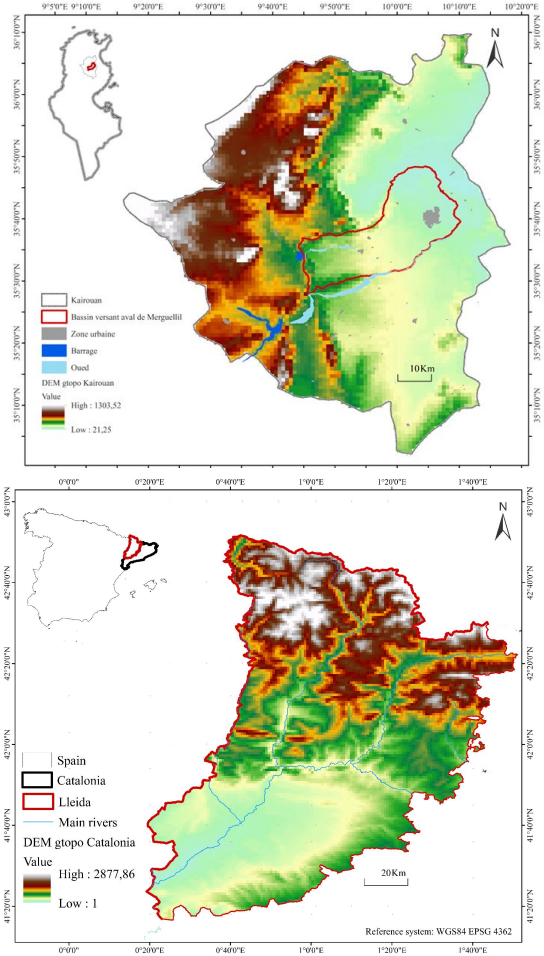
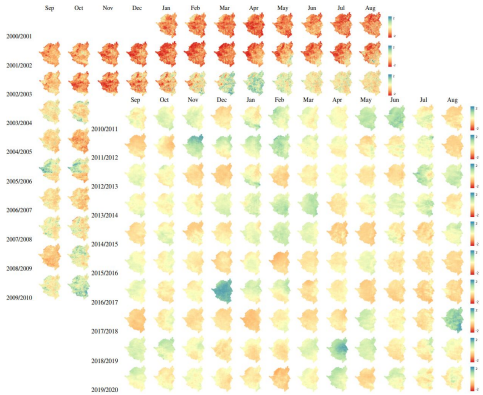
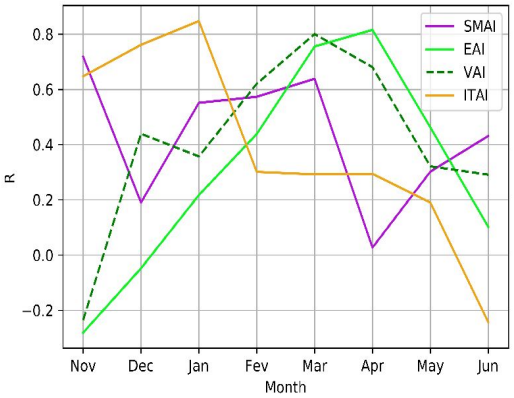
Drought indices

SMAI, VAI, EAI, ITAI

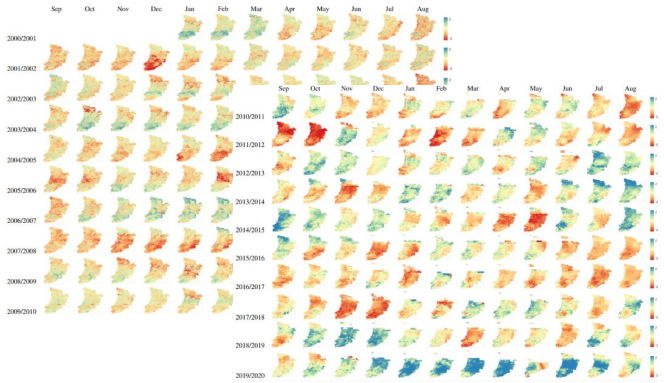


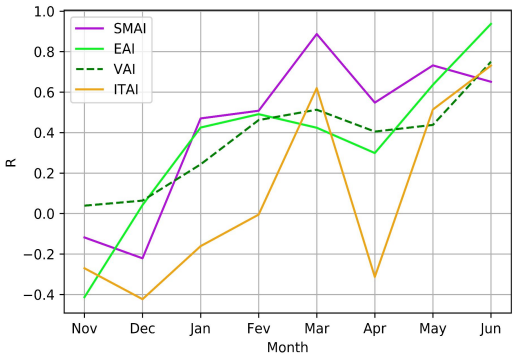


Correlation between yield and drought indices

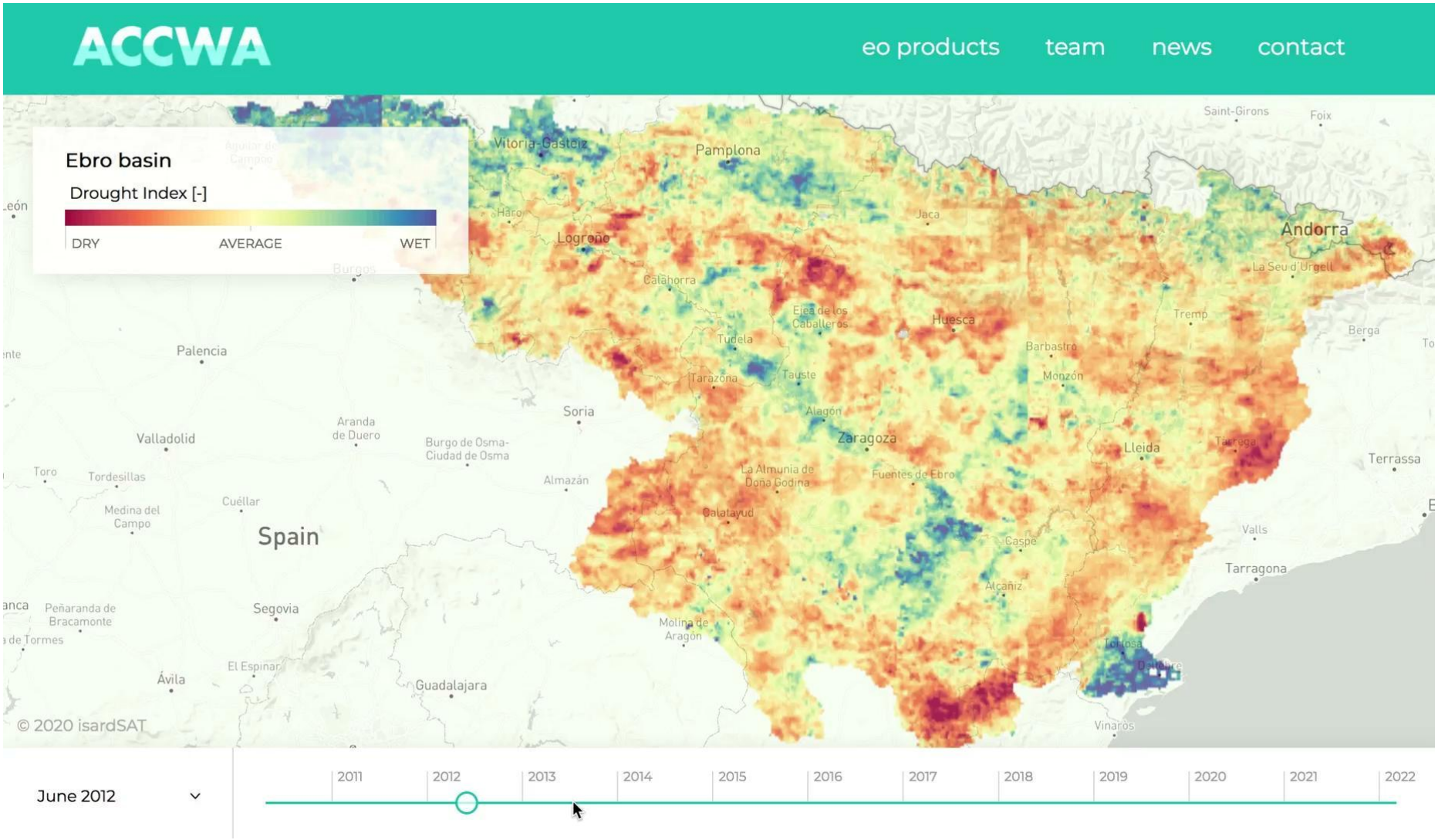


Period: 2000/2001 → 2019/2020





Khlif et al. in preparation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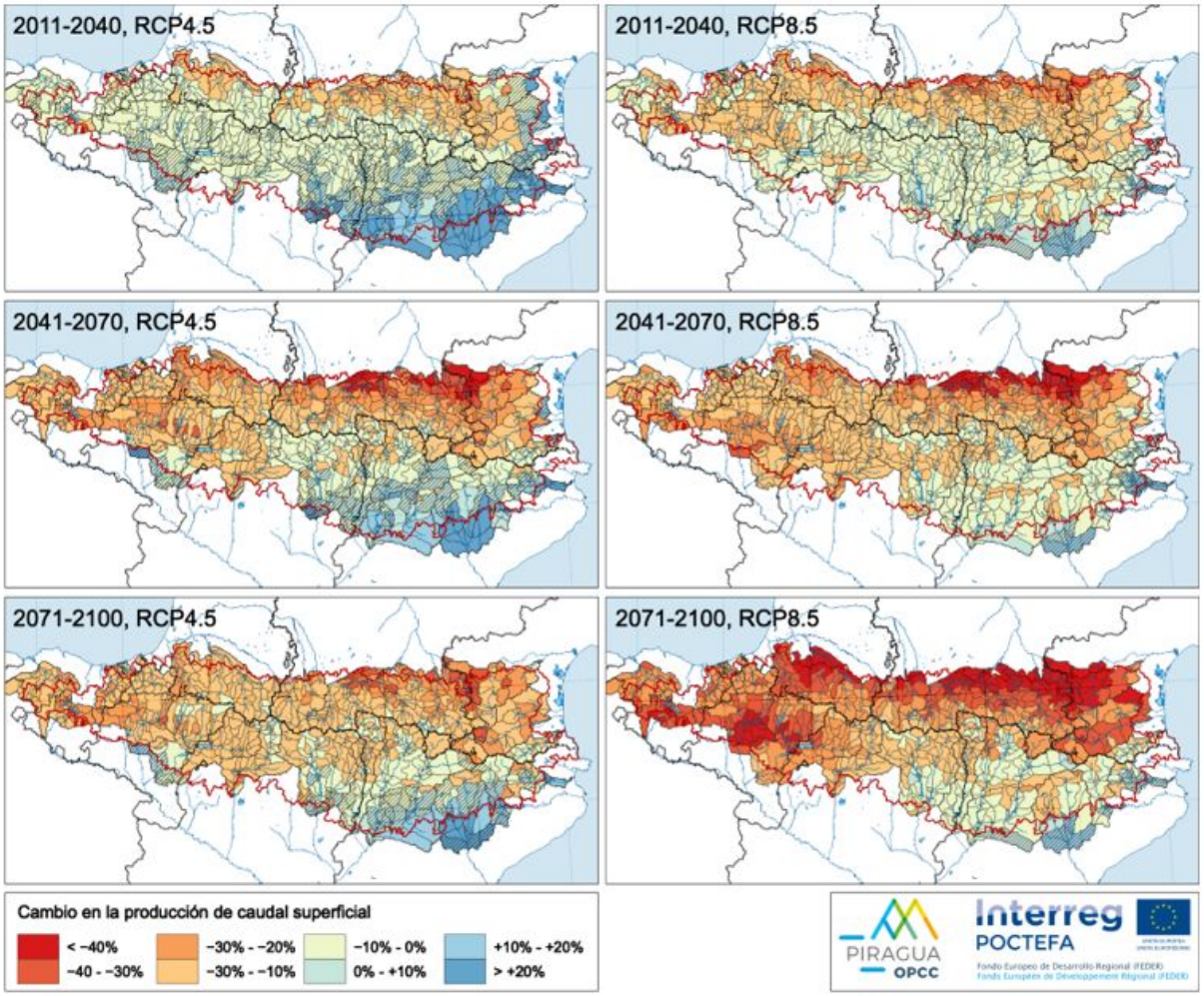
eo products
team
news
contact
Ebro basin
Drought Index [-]
DRY
AVERAGE
WET
Vitoria-Gasteiz
Pamplona
Logroño
Haro
Jaca
Andorra
Calahorra
Ejea de los Caballeros
Huesca
Tudela
Tarazona
Tauste
Barbastro
Monzón
Soria
Alagón
Zaragoza
Lleida
Palencia
Valladolid
Aranda de Duero
Burgo de Osma-Ciudad de Osma
Almazán
La Almunia de Doña Godina
Fuentes de Ebro
Calatayud
Caspe
Alcañiz
Tarragona
Spain
Segovia
Molina de Aragón
Ávila
El Espinar
Guadalajara
Peñaranda de Bracamonte
Medina del Campo
Cuéllar
Toro
Tordesillas
Terrassa
Saint-Girons
Foix
La Seu d'Urgell
Tremp
Berga
Valls
Vinaròs
© 2020 isardSAT
June 2012
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

Climate Change Impact



Conclusions

ACCWA will implement remote sensing management tools for water and agricultural management critically needed in a context of climate change.

Innovative EO datasets (SM, ET, VEG) are being developed with multiple possible applications

The exchange of personnel results in fruitful exchange of know-how between participants

Numerous diffusion and outreach activities result in network knitting and future activities identification

ACCWA

Thank you!