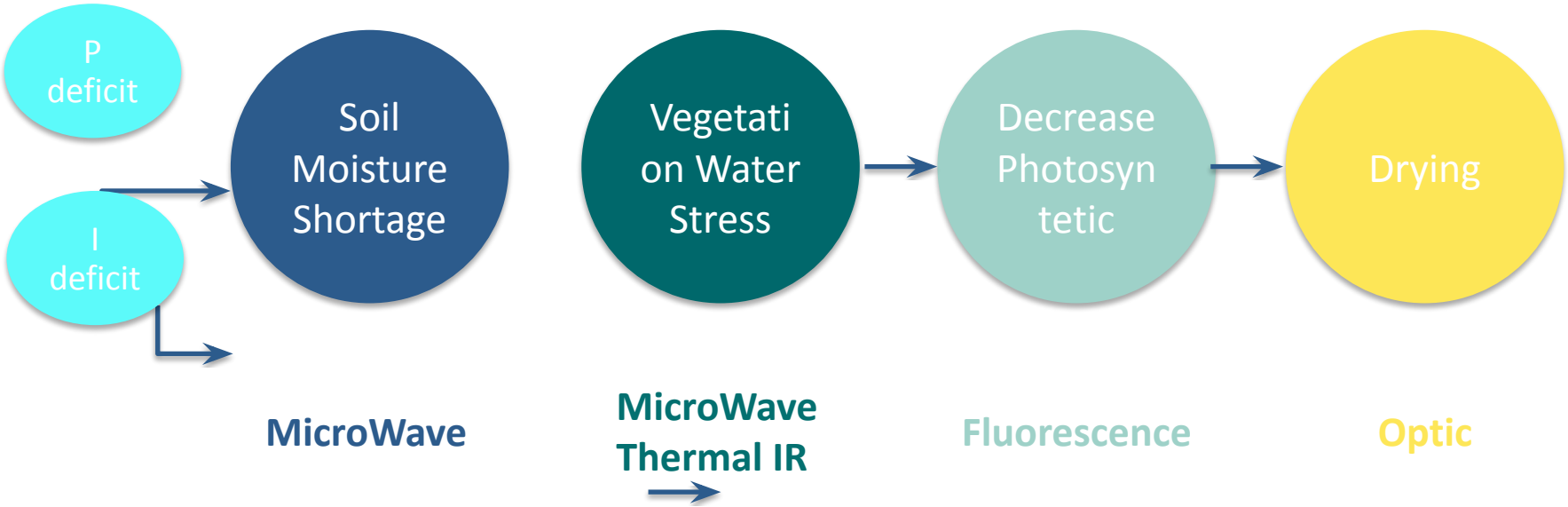
ACCWA

Improved SM products at 1km spatial resolution and derived indices

OPD Meeting UCAR, November 12th, 2019

Remote Sensing can provide comprehensive view on the **soil and vegetation conditions** and thus help in irrigation management

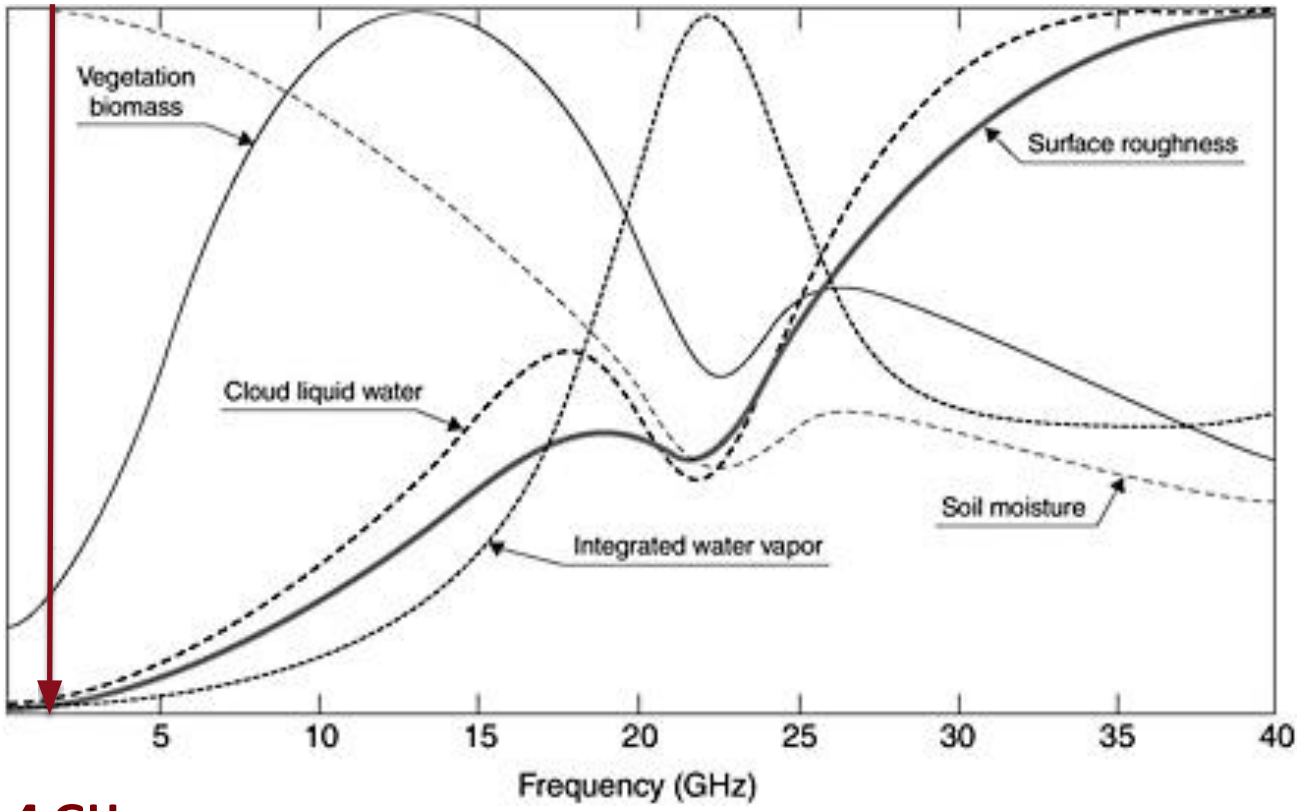
Agricultural Drought - dynamics and monitoring



Soil Moisture

MW

- active
- passive



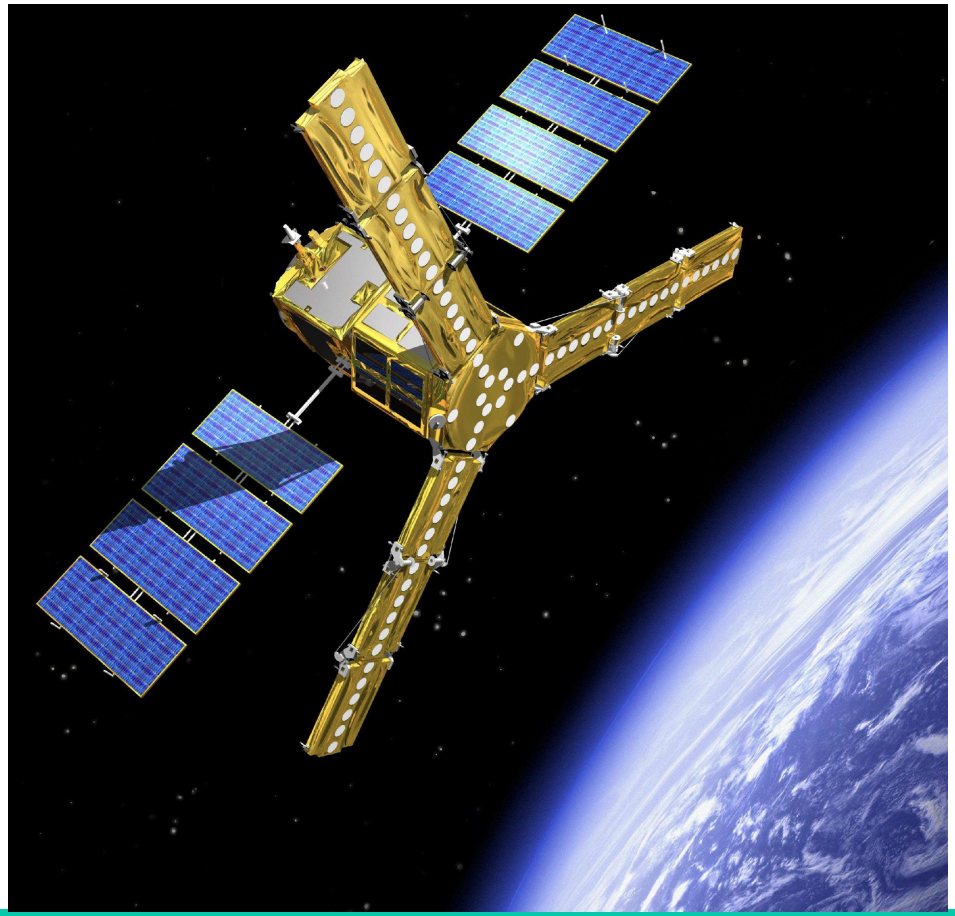
1.4 GHz

high sensitivity to dielectric constant in MW domain

Soil Moisture

SMOS mission provides for the first time global mapping of soil moisture from L- band (1.4 GHz) MW radiometry

- soil moisture accuracy 0.04 m3m-3
- biomass ≤ 5 kg m^{-2}
- spatial resolution better than 50 km
- revisit frequency of 2 to 3 days

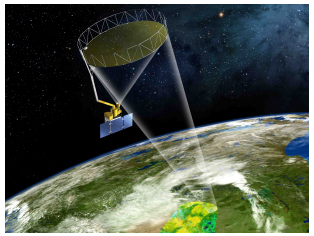


Soil Moisture

SMOS

2021

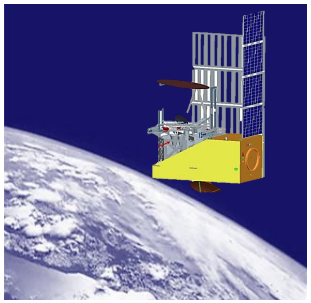
November 2
2009



SMAP

2020

January 31
2015



CIMR

scheduled 2026

L-band Passive MW SMOS/SMAP/WCOM
- accuracy 0.04 m3/m3
- low spatial resolution 40 km
- high temporal 2/3 d

+

Medium Resolution O/T S3/MODIS
(1 km, 1 d)

NSSM (1 km, 2/3 d)

NSSM

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Medium Resolution O/T S3/MODIS
(1 km, 1 d)

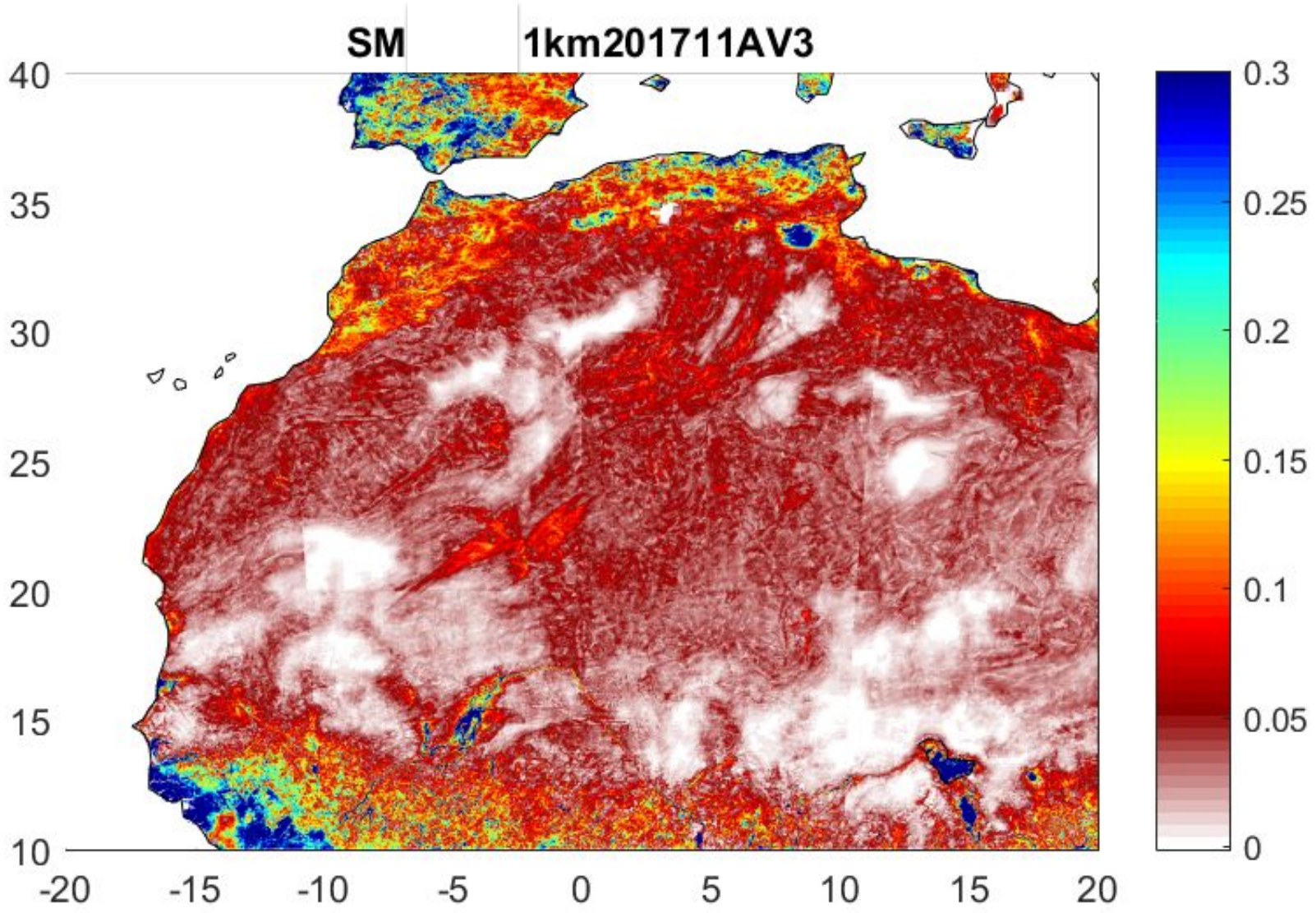
NSSM (1 km, 2/3 d)

Merlin et al. 2013 Self-calibrated evaporation-based disaggregation of SMOS soil moisture: An evaluation study at 3 km and 100 m resolution in Catalunya, Spain, RSE
Escorihuela and Quintana-Seguí 2016 Comparison of remote sensing and simulated soil moisture datasets in Mediterranean landscapes, RSE

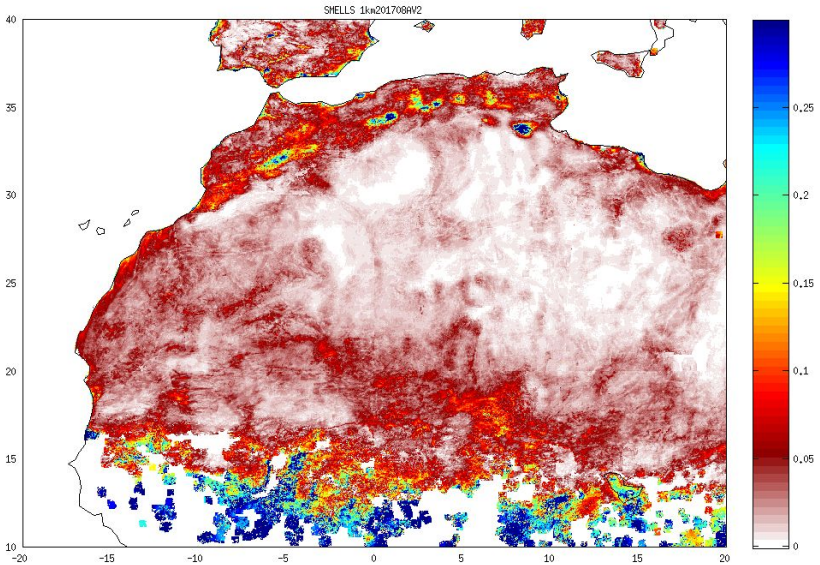
Soil Moisture 1km

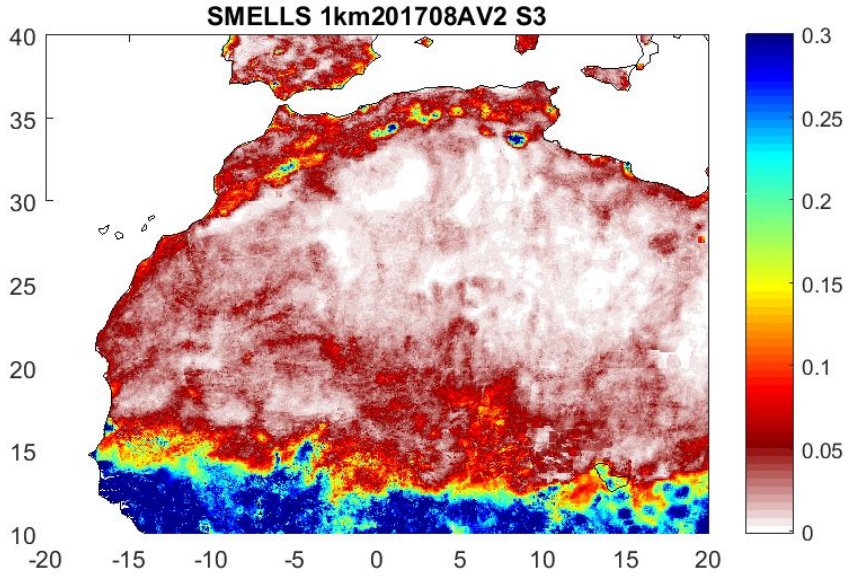
Data	SMOS derived SM
Temporal coverage	Since 2010
Spatial coverage	Global
Temporal resolution	Every 2/3 days
Spatial Resolution	1Km
Accuracy	0.04 m^3m^{-3}
Delivery	WMS, FTP, direct download

Soil Moisture 1km



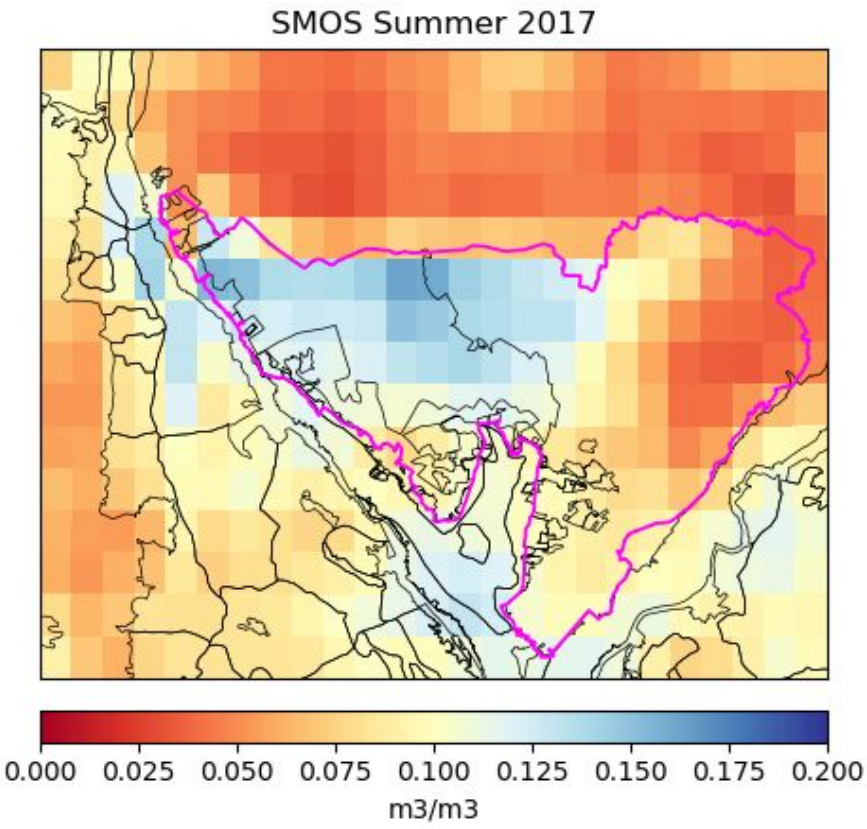
DISPATCH with Sentinel-3 (1 km)

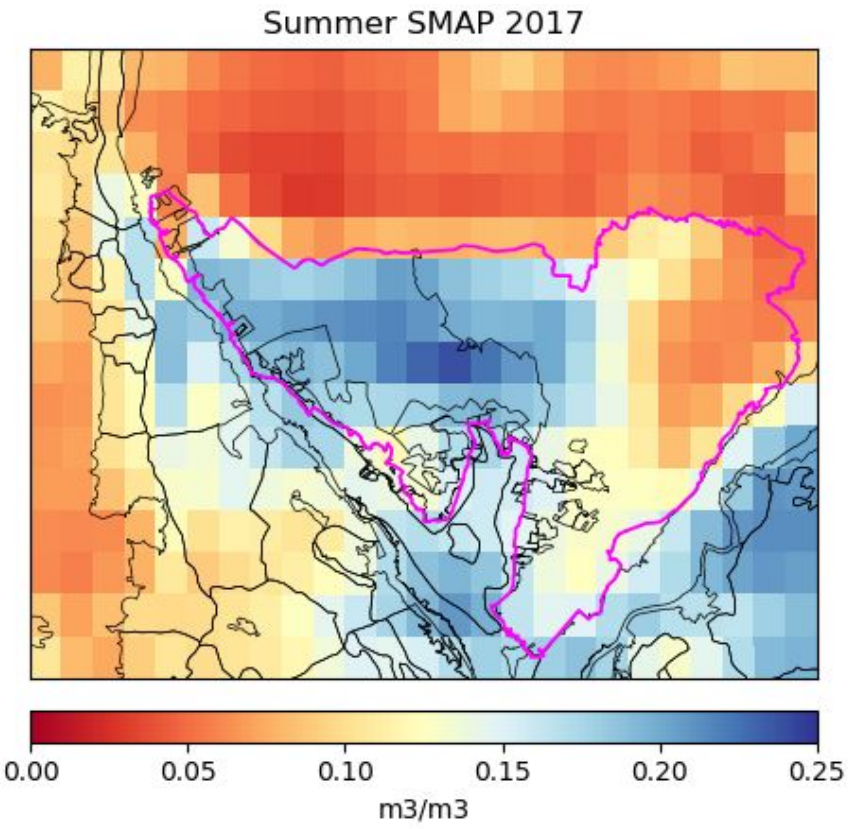




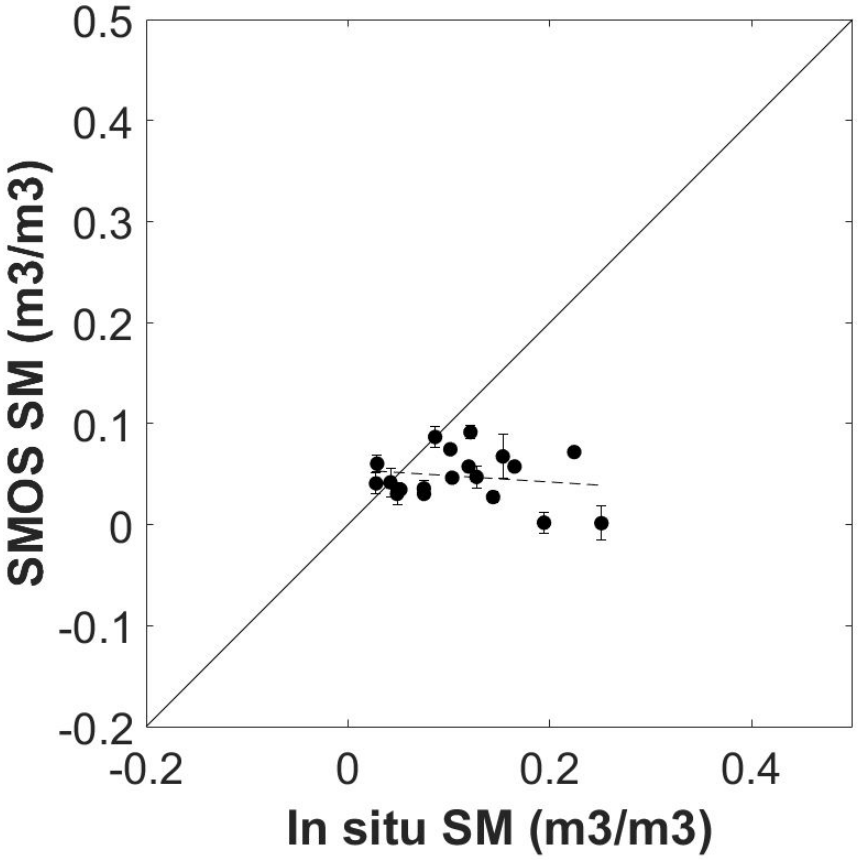
Soil Moisture 1km

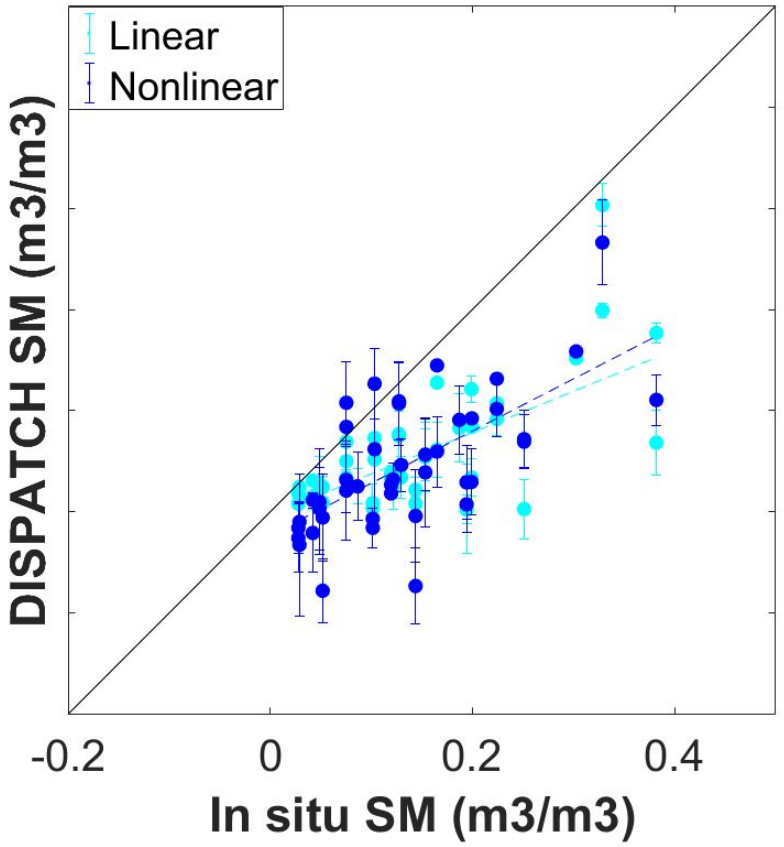
SMAP based SM 1km from 2015 onwards





Introduction of a non-linear relationship on the downscaling





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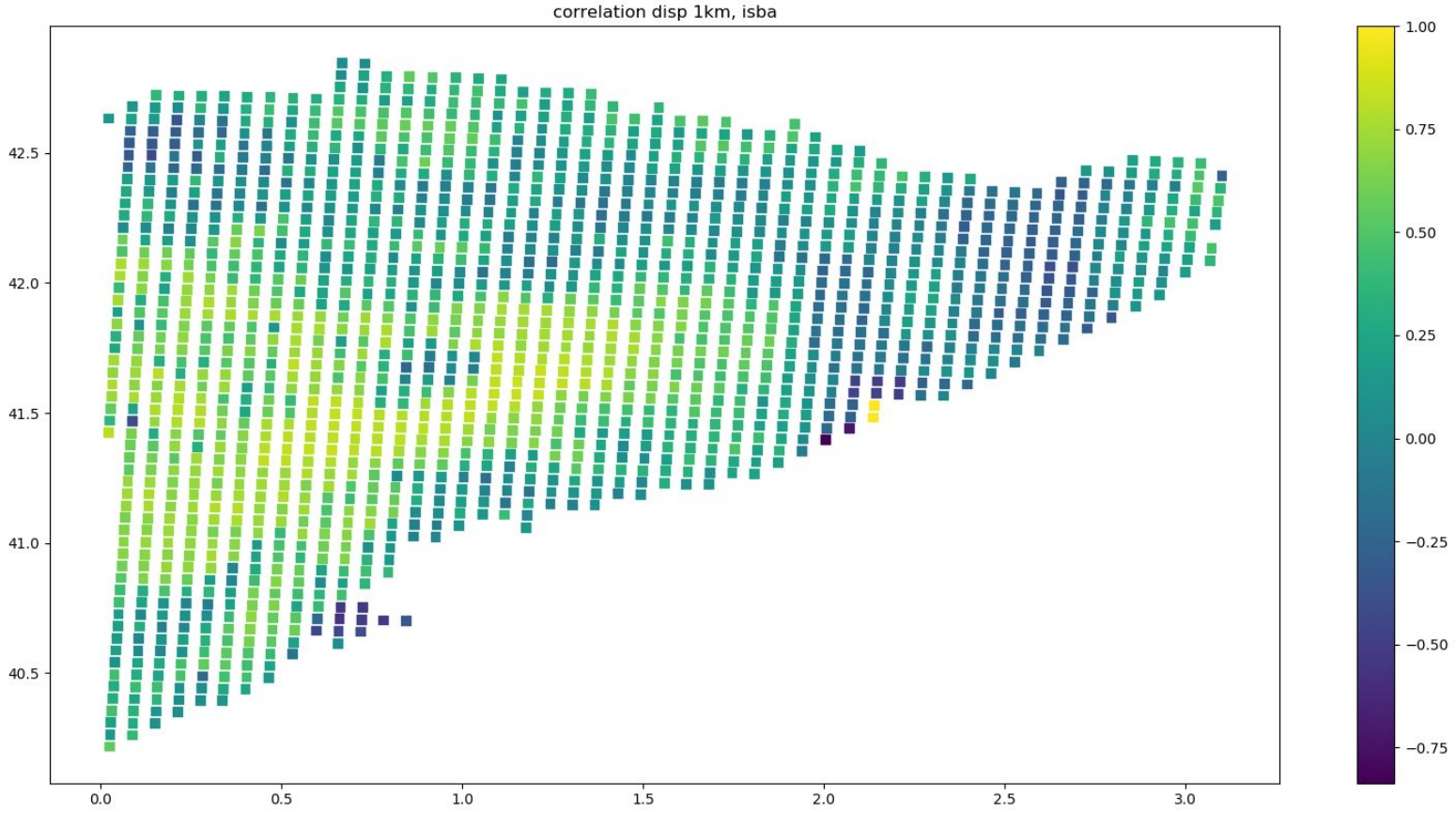
RZSM 1km



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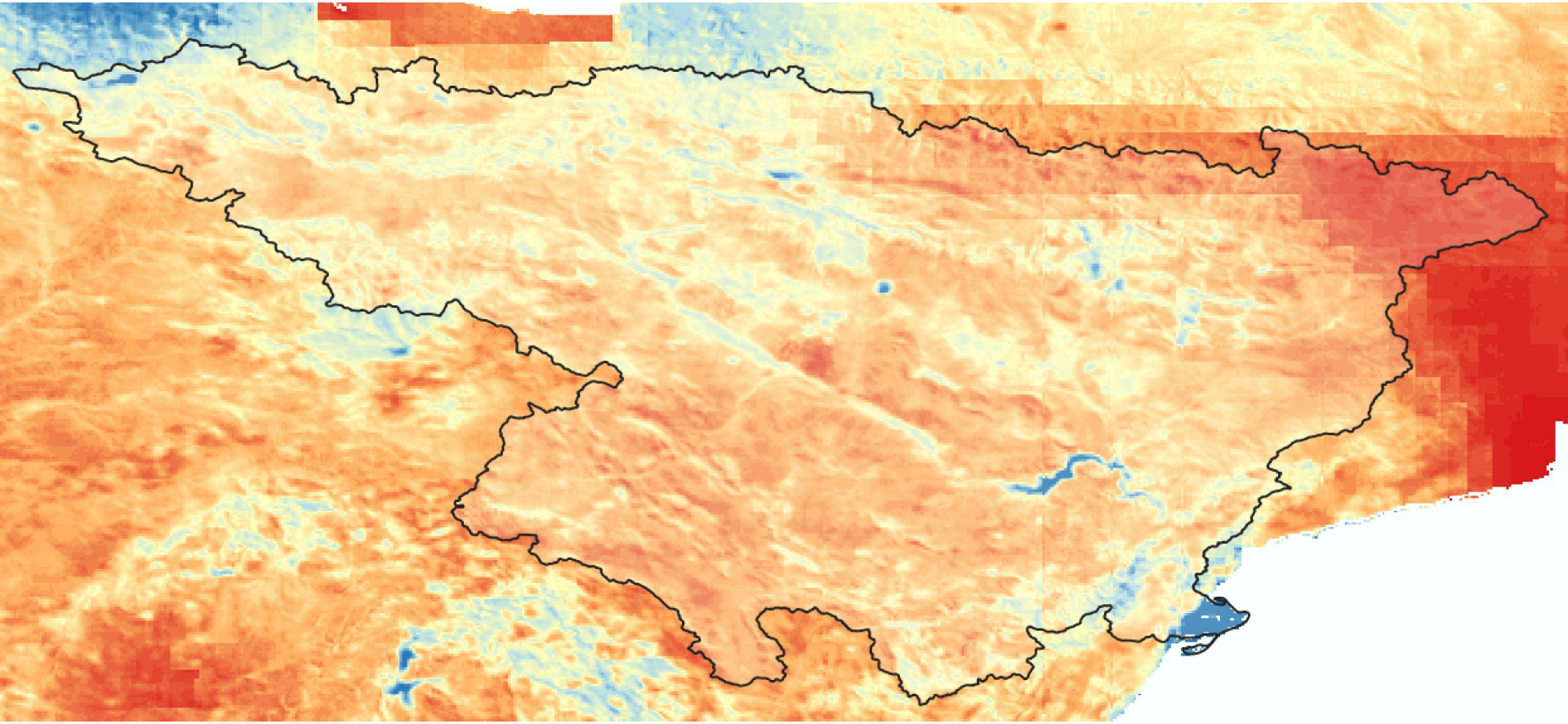
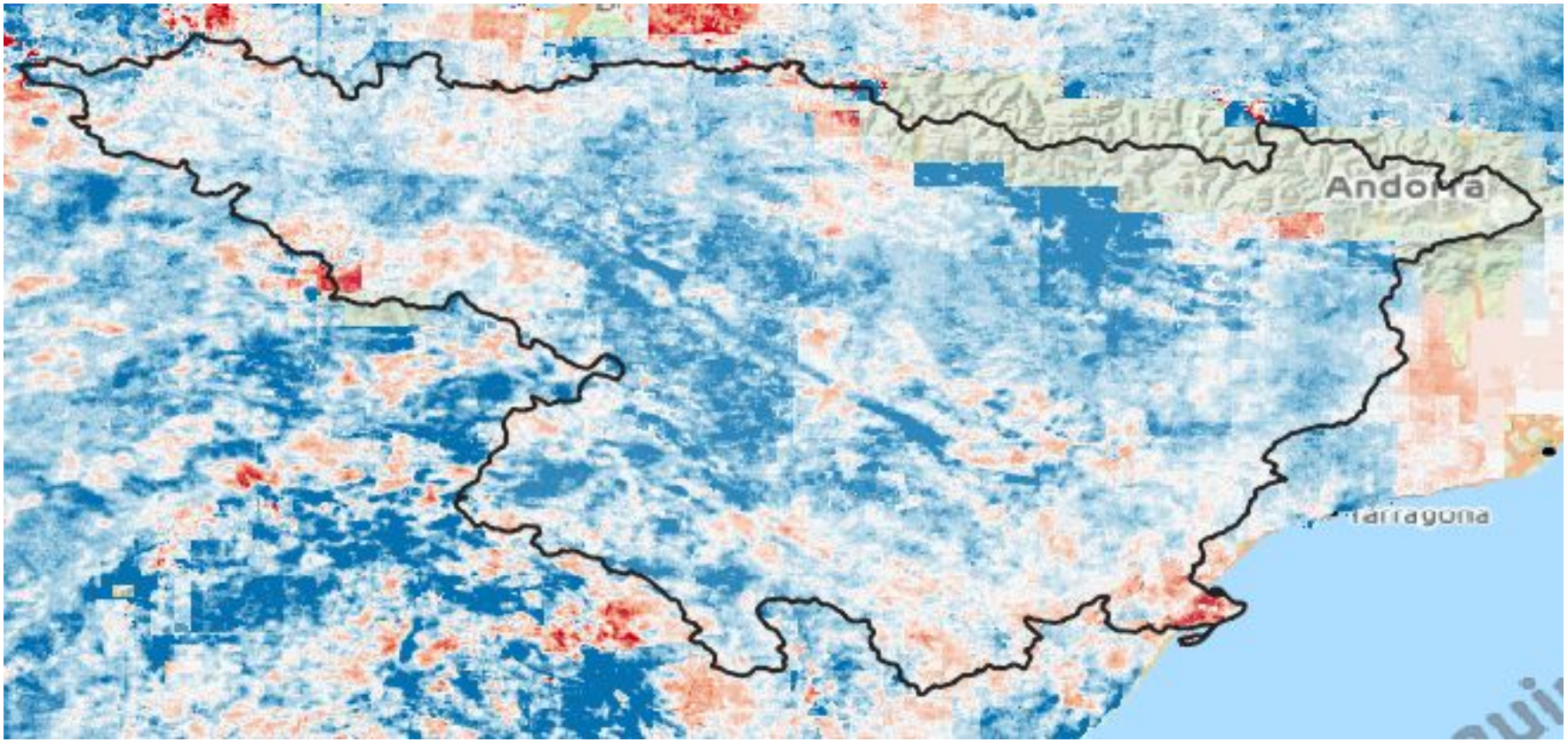
Soil Moisture 1km long term

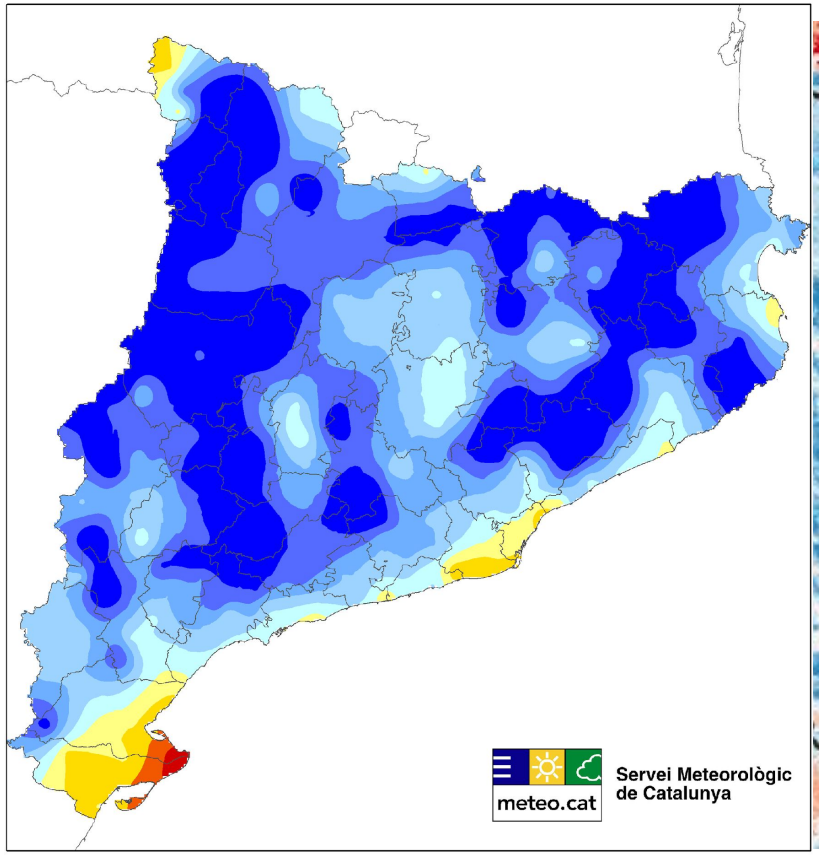


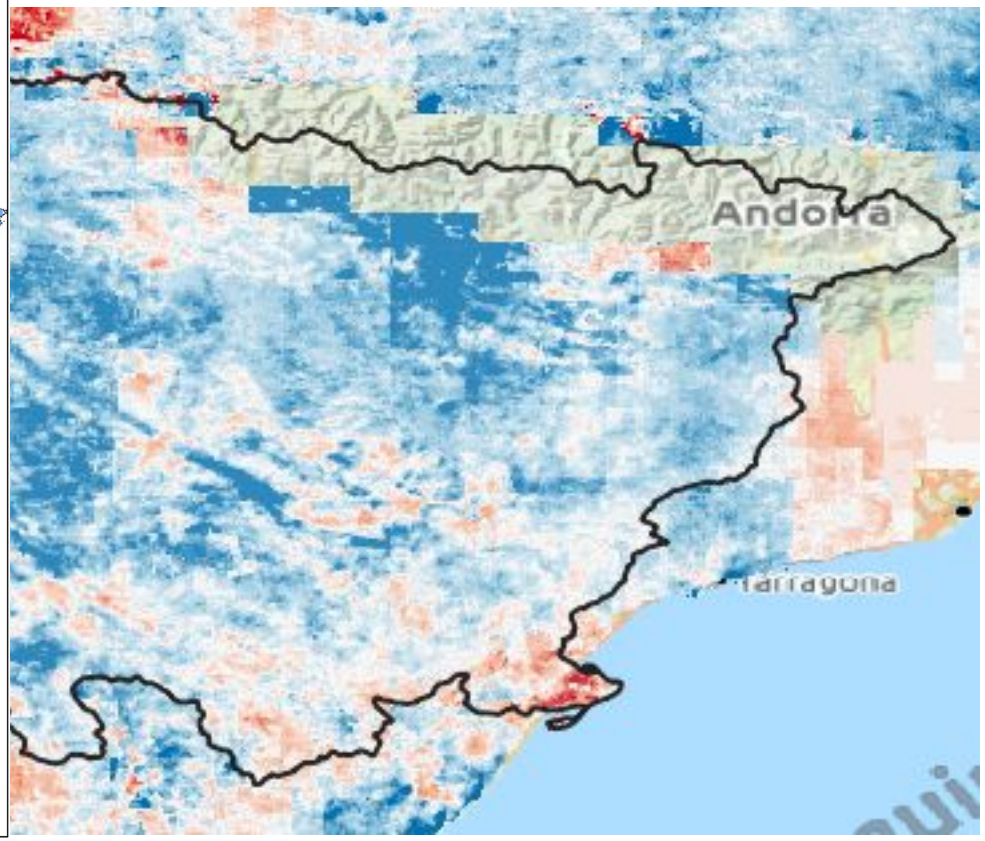
Soil Moisture 1km anomalies

April 2018



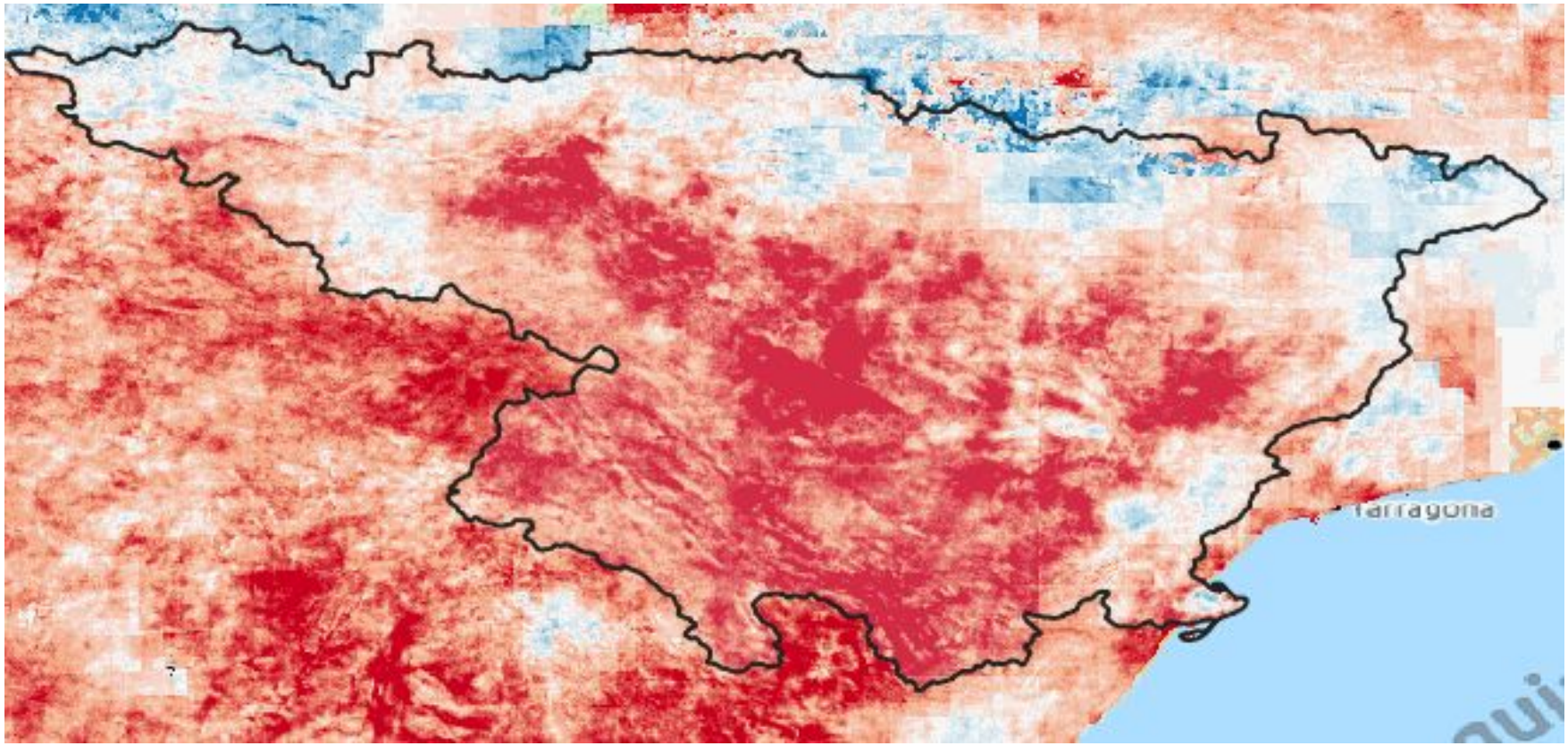
Soil Moisture 1km anomalies





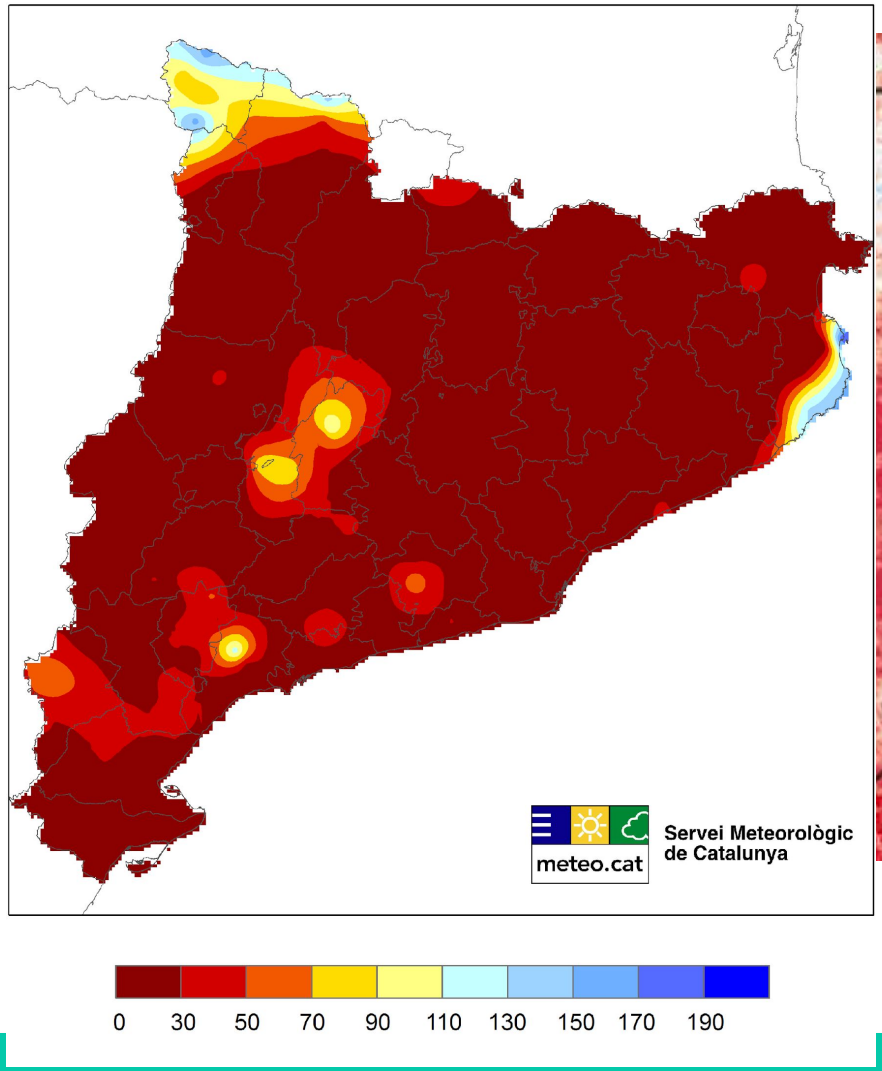
Soil Moisture 1km anomalies

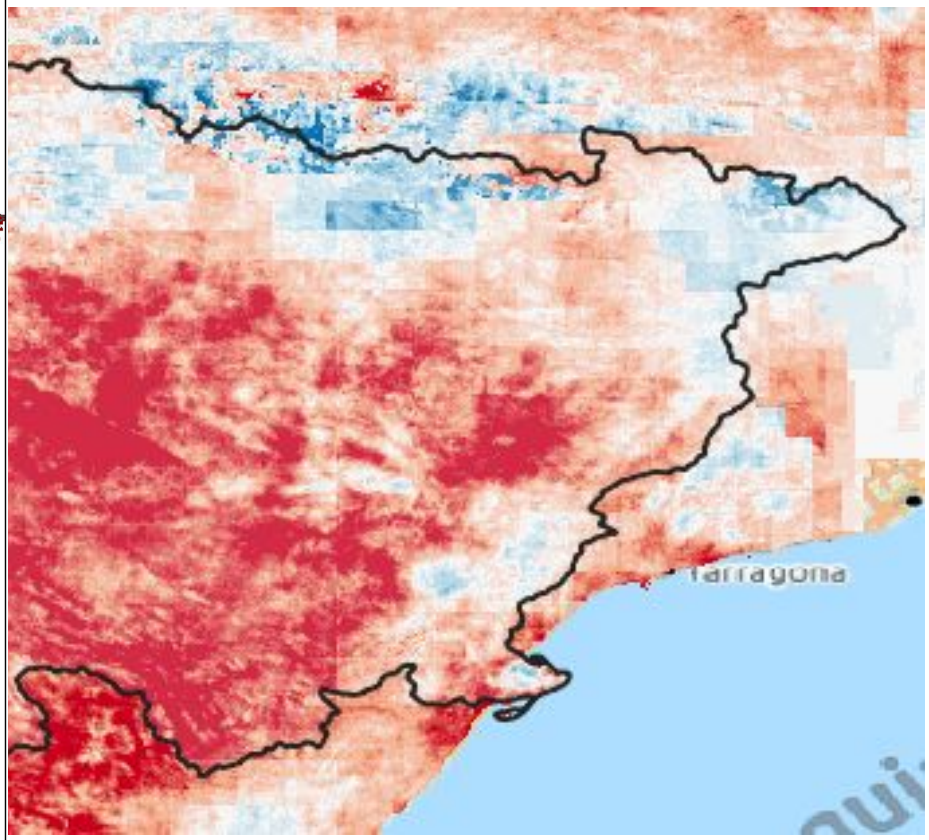
November 2017



Soil Moisture 1km anomalies

ACCWA





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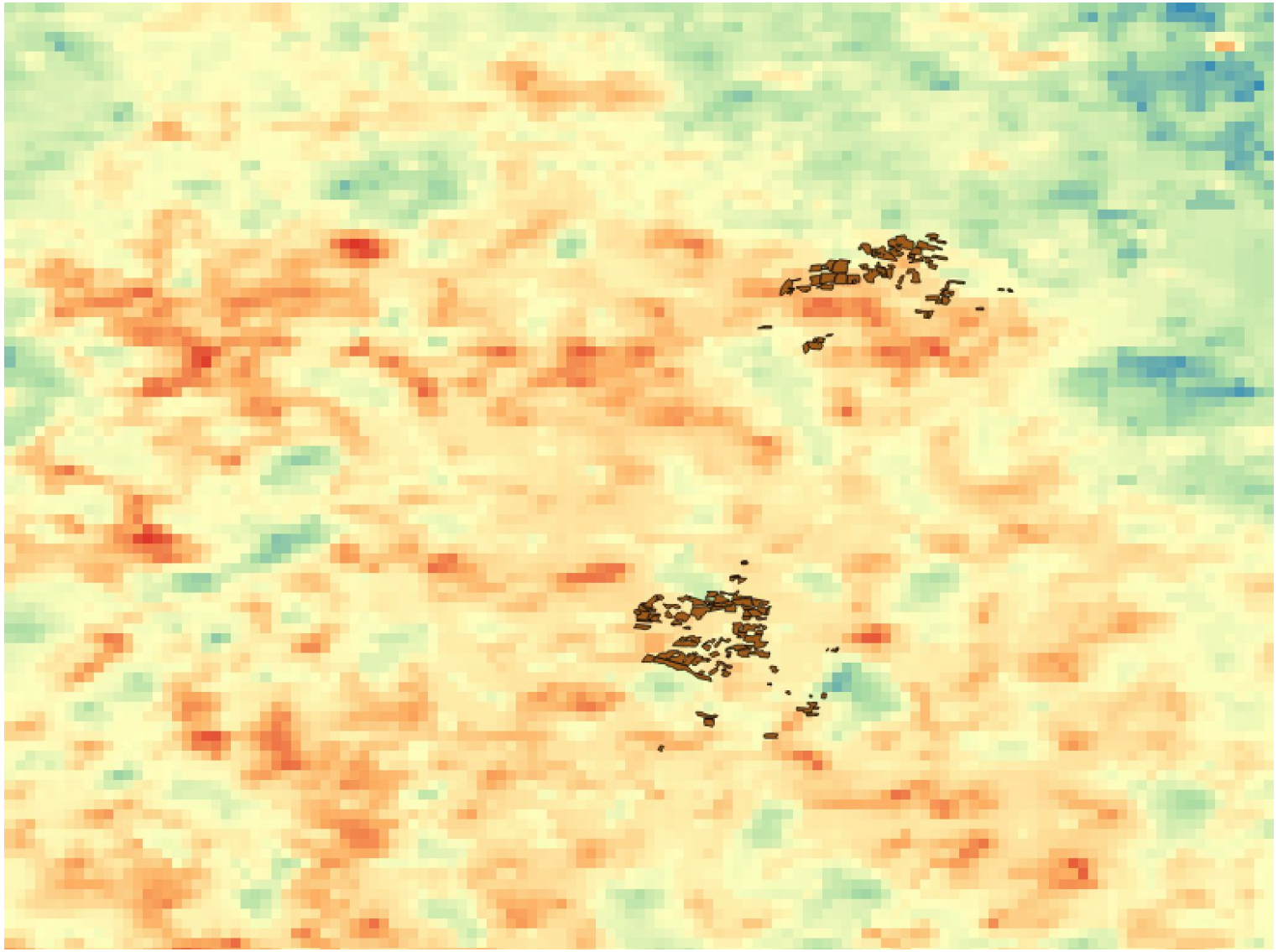
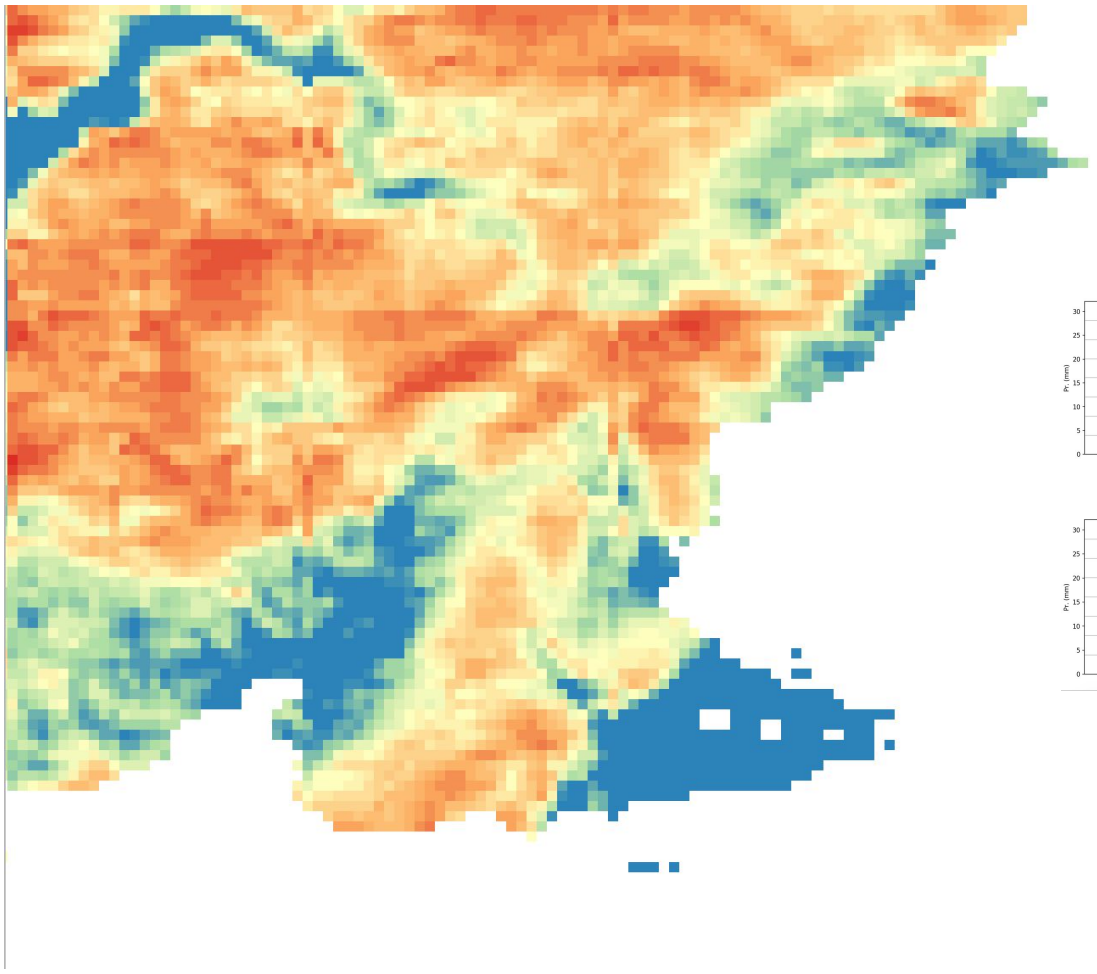
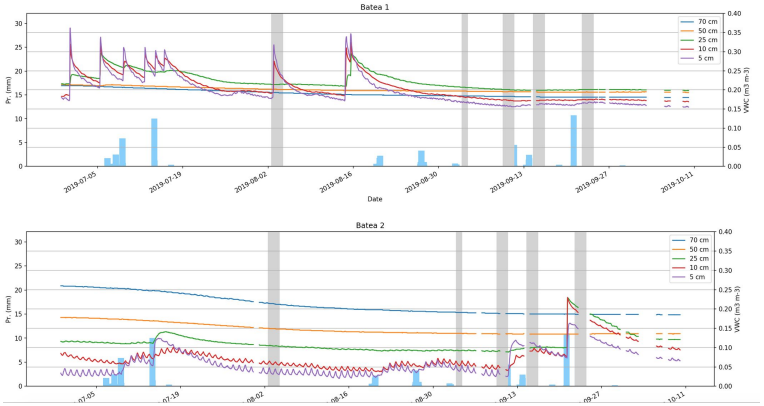
Agriculture insurance



Irrigation advice





Conclusions

We have a long term series high quality EO SM at 1 km

Continuous efforts to improve the quality of the existing algorithm (better RFI filtering, non-linear relationship etc.) and inclusion of new EO datasets (S3, SMAP, etc.)

RZSM 1km soon available, currently under validation

The length of the series allows to estimate SM anomalies that seems correlated with Precipitation anomalies

Working with users in application: yield insurance, irrigation advice

ACCWA

Thank you!