COPERNICUS Services for Agricultural Monitoring in Romania

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Project title: COPERNICUS infrastructure for a national advisory system for irrigated perimeters

Acronym: GEOFARM

Project type: R&D Partnership/national funding

Implementation: 2015 - 2017

Partners:

1 national public institution (Romanian Space Agency), 1 university (University of Agricultural Sciences and Veterinary Medicine Bucharest), 1 research institute (Institute of Agricultural Economy of the Romanian Academy) and 2 private companies (1 SME & 1 Large Enterprise)

<u>Main objective</u>: to establish COPERNICUS service capacities for the irrigation water management user community in Romania

GEOFARM project is a complementary and locally adapted approach to the concluded FP7 SIRIUS project (COPERNICUS core services)

<u>Specific objectives</u>:

- Maintaining the irrigation water user community
- COPERNICUS-assisted toolsets
- Business community and sustainable implementation

Main Earth Observation – derived products:

-NDVI (Normalized Difference Vegetation Index)

-LAI (Leaf Area Index)

-Fraction of Absorbed Photosintetically Active Radiation (FAPAR)

-Fraction of vegetation cover (FCOVER)

-Salinity index

-others

Objective: *to investigate the sensitivity of Landsat OLI and Sentinel-1 C-band radar signals to monitor an agricultural area affected by soil salinization and land degradation.*

Earth Observation data

- **Landsat TM covering 2000-2014 period**

- **Sentinel-1: a time series of IWS, GRD, dual polarized data acquired on ascending and descending nodes between August 2014 - January 2015.**
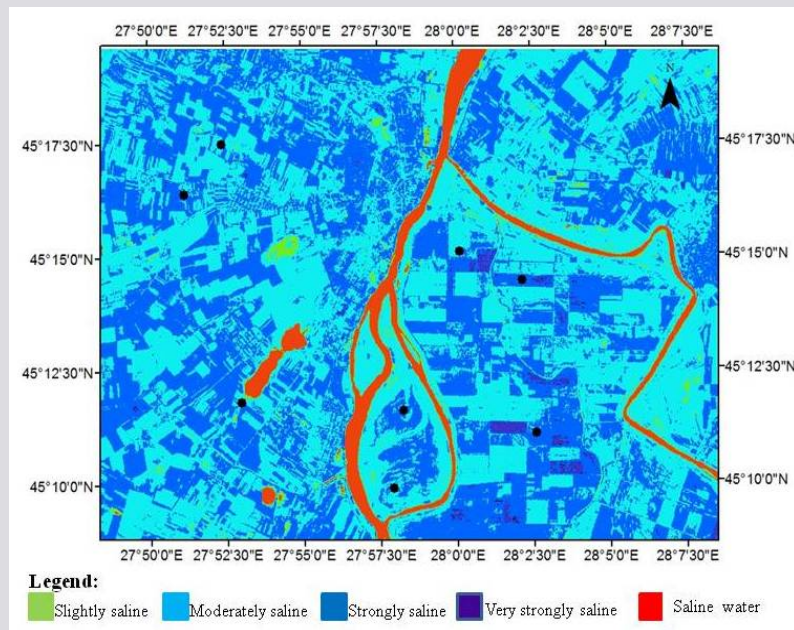
- **MODIS evapotranspiration product**

False colour composite of Landsat data acquired on 16.07.2011 (R: TM1; G: TM2, B: TM3): detection of salt affected soil represented with white –blue colour.

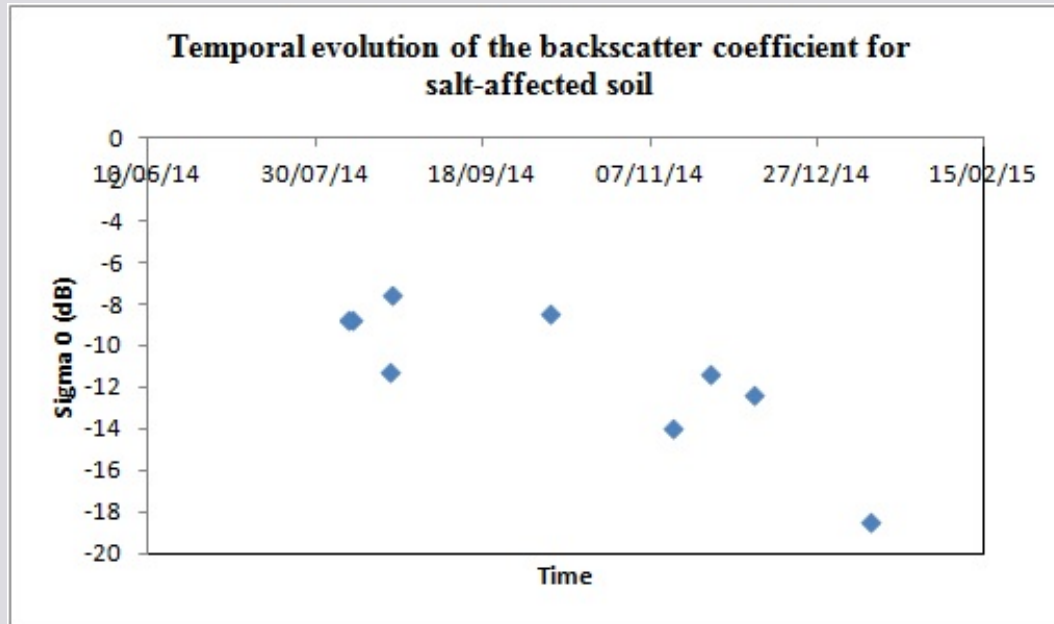Soil and vegetation indices analysis. Salinity index map.
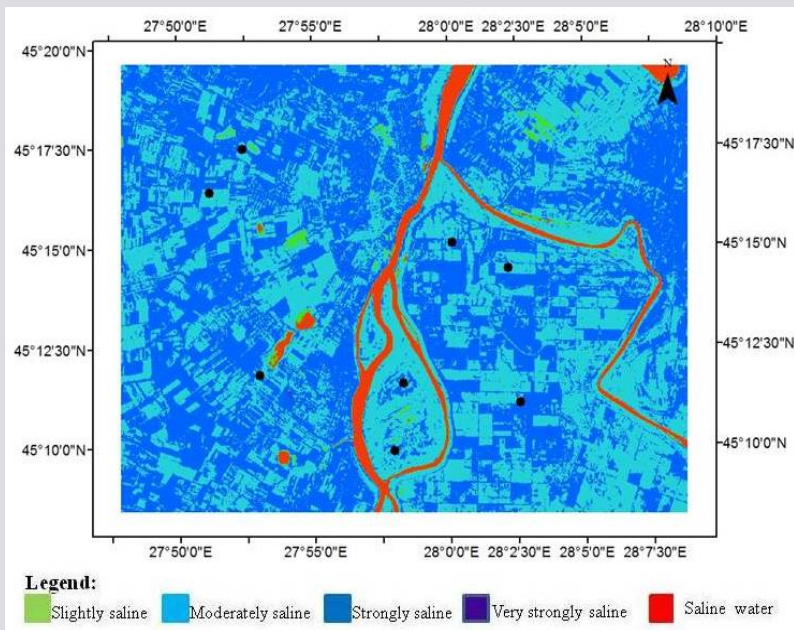
Backscattering coefficients analysis based on Sentinel-1A data
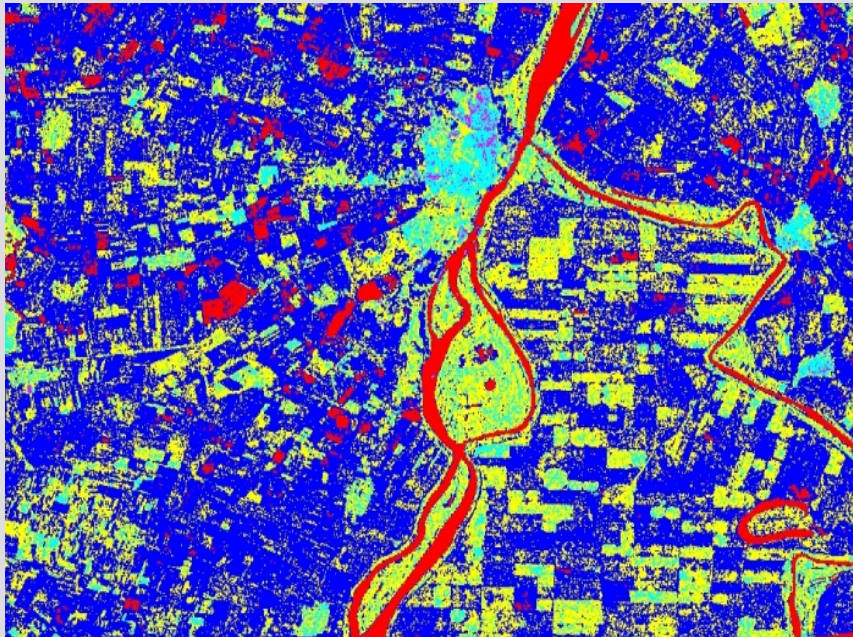

Multi-temporal filtering of Sentinel imagery

- 🟦 22.08.2014
- 🟩 10.08.2014
- 🟥 14.11.2014

Backscattering coefficients analysis based on Sentinel-1A data
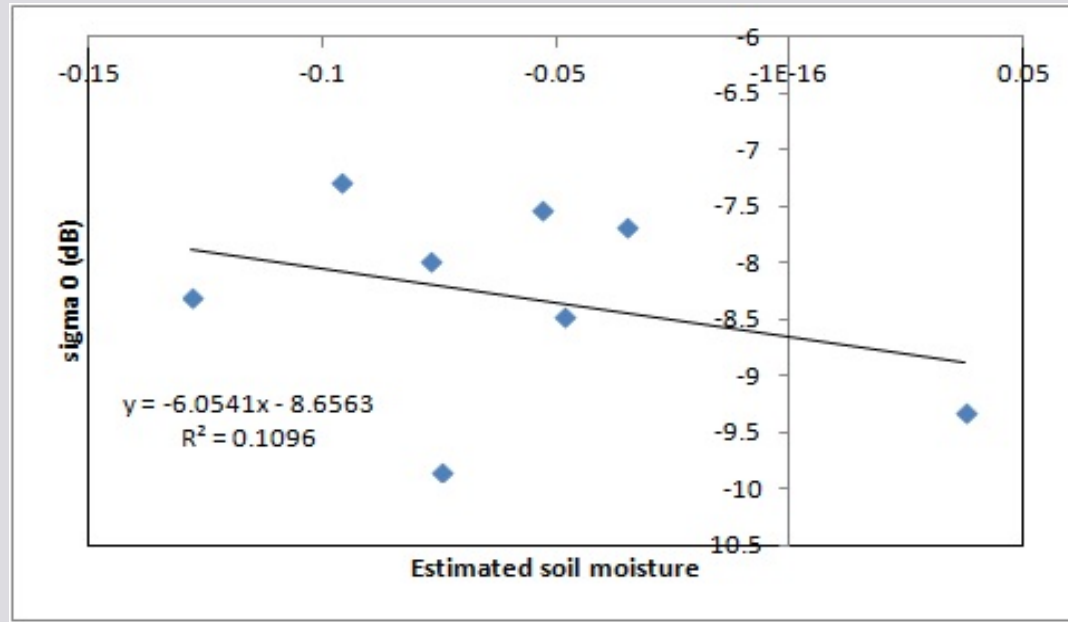
SAR classification based on Sentinel-1A data

- ■ vegetated areas
- ■ bare soils
- ■ water bodies and surface soil moisture
- ■ urban areas

SAR classification based on sigma nought values (Sentinel-1 image acquired on 22.08.2014).

Relationship between Sigma 0 acquired in GRD mode and soil moisture

This study assesses the sensitivity of Landsat OLI and Sentinel-1 C-band to monitor an agricultural area from Braila Plain affected by soil salinity and land degradation.

Building on the strength of multi-spectral satellite imagery, a new approach is suggested for relating soil moisture on backscatter coefficient. The results confirm soil degradation and the synergy of using multi-spectral and radar data for crops monitoring.
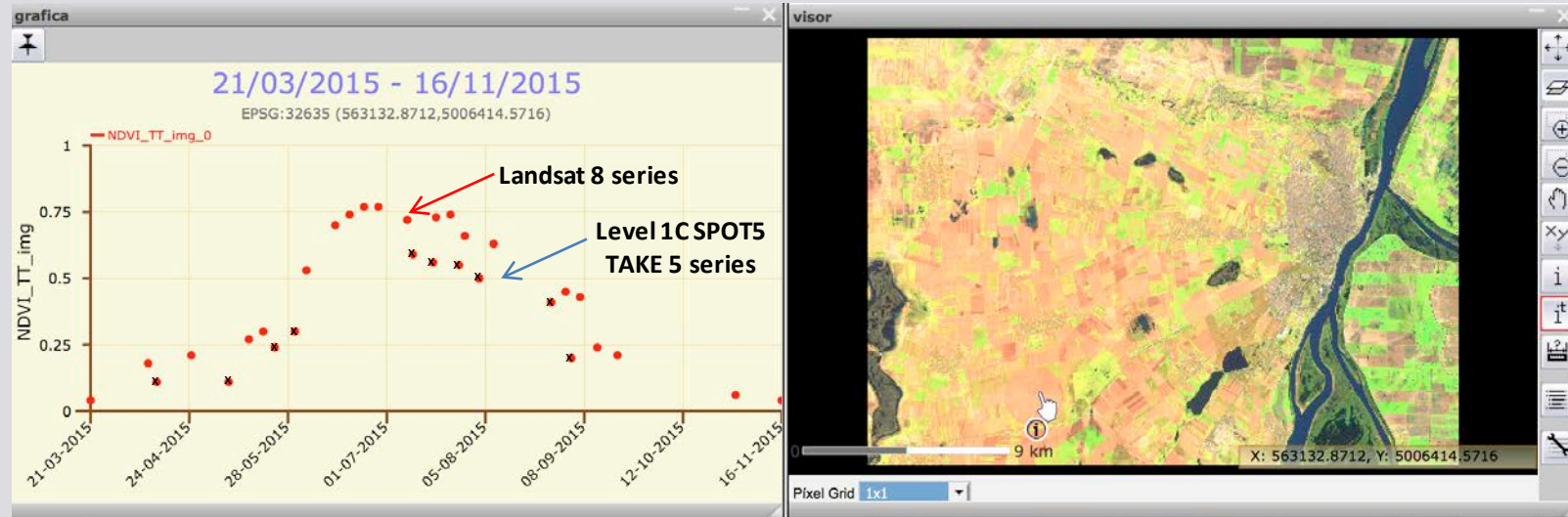
SPOT 5 TAKE 5

- 23 SPOT5 images – 4 images unusable due to cloud cover
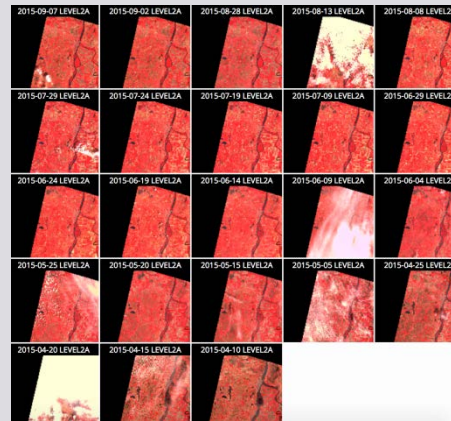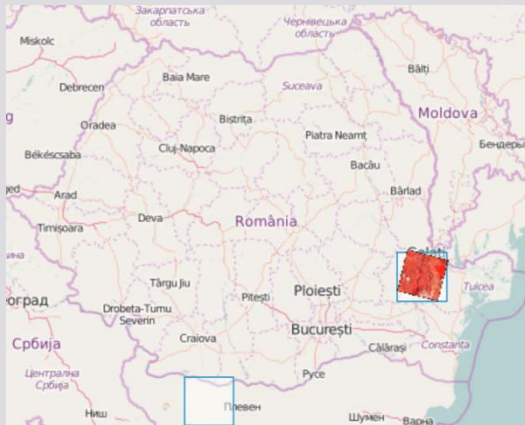
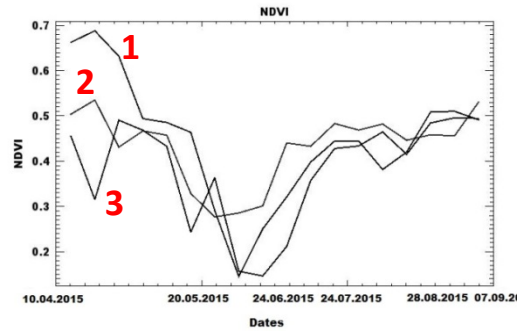Braila – Cazasu site

Level 2A images online since 14.04.2016

GEOFARM SIRIUS ppGIS interface

NDVI graphs & false colour composite RGB

living planet symposium 2016

SPOT5 Take5 imagery

NDVI time series

NDVI color composite

25.05.2015
04.06.2015
19.06.2015

9–13 May | Congress Centre | Prague | Czech Republic

European Space Agency

Thank you for your attention!