The impact of dry spells and heat waves on vegetation cover in Romania. Case studies

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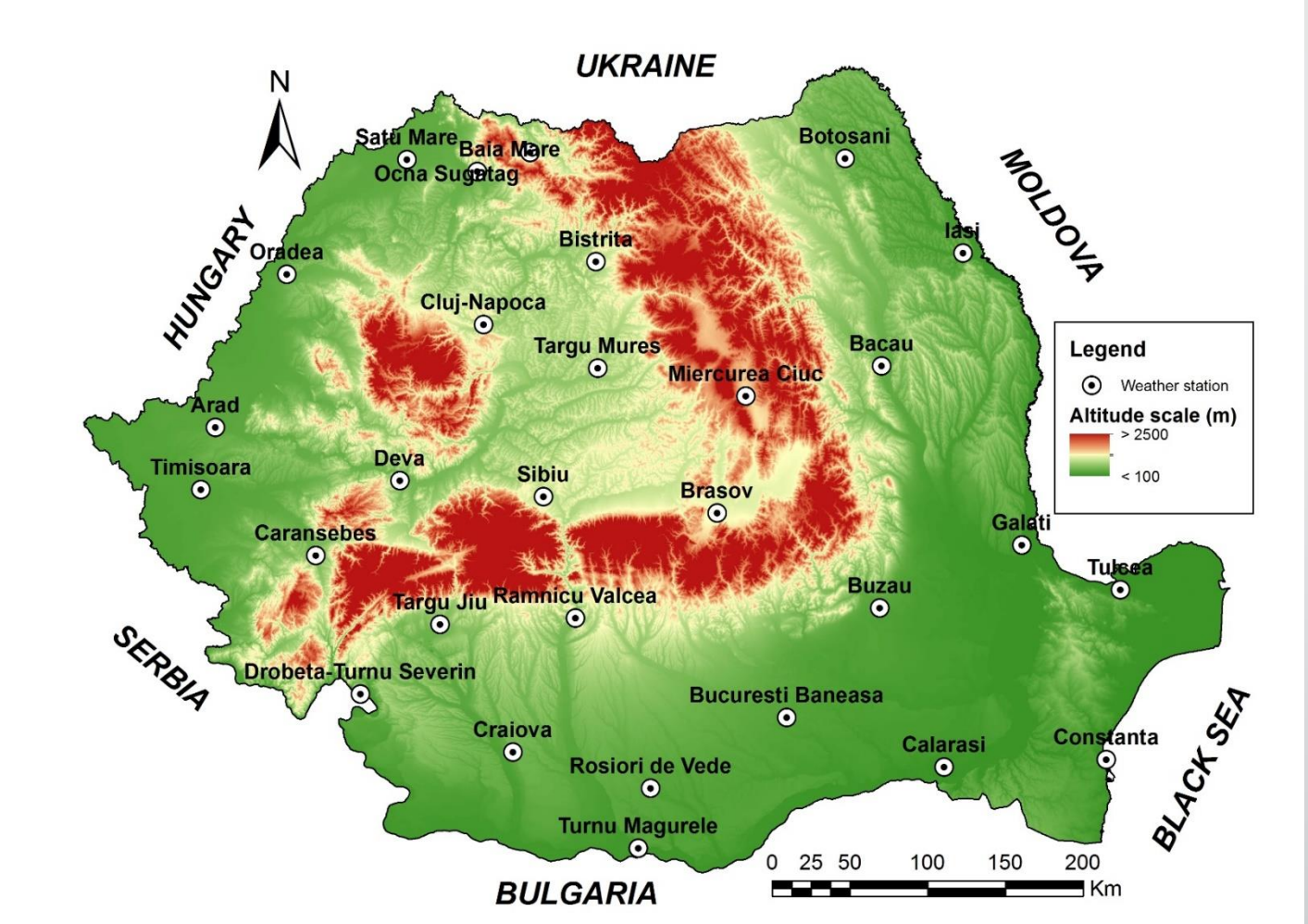
Roșca Florina-Cristina, Croitoru Adina-Eliza, Piticar Adrian, Ciupertea Antoniu-Flavius

The main objectives

- The impact of dry spells and warm spells/heat weaves on vegetation cover during spring and summer

- To explore the spatial patterns of affected area



Location of study area

❖Data:

- the satellite data => U.S. Geological Survey (http://glovis.usgs.gov/);
  => 16-yr period between 2000 and 2015;
  => spring and summer;
  => recorded by the MODIS satellite with a spatial resolution of 500 m, 8-Days synthesis and 1 km resolution and 16-Days synthesis

- meteorological data (29 weather station in Romania):
  - daily maximum temperature

  - daily precipitation

❖Methods:

Normalized Difference Vegetation Index (NDVI) product was developed to analyzed the impact of vegetation coverage for areas with altitude less or equal than 700 m.

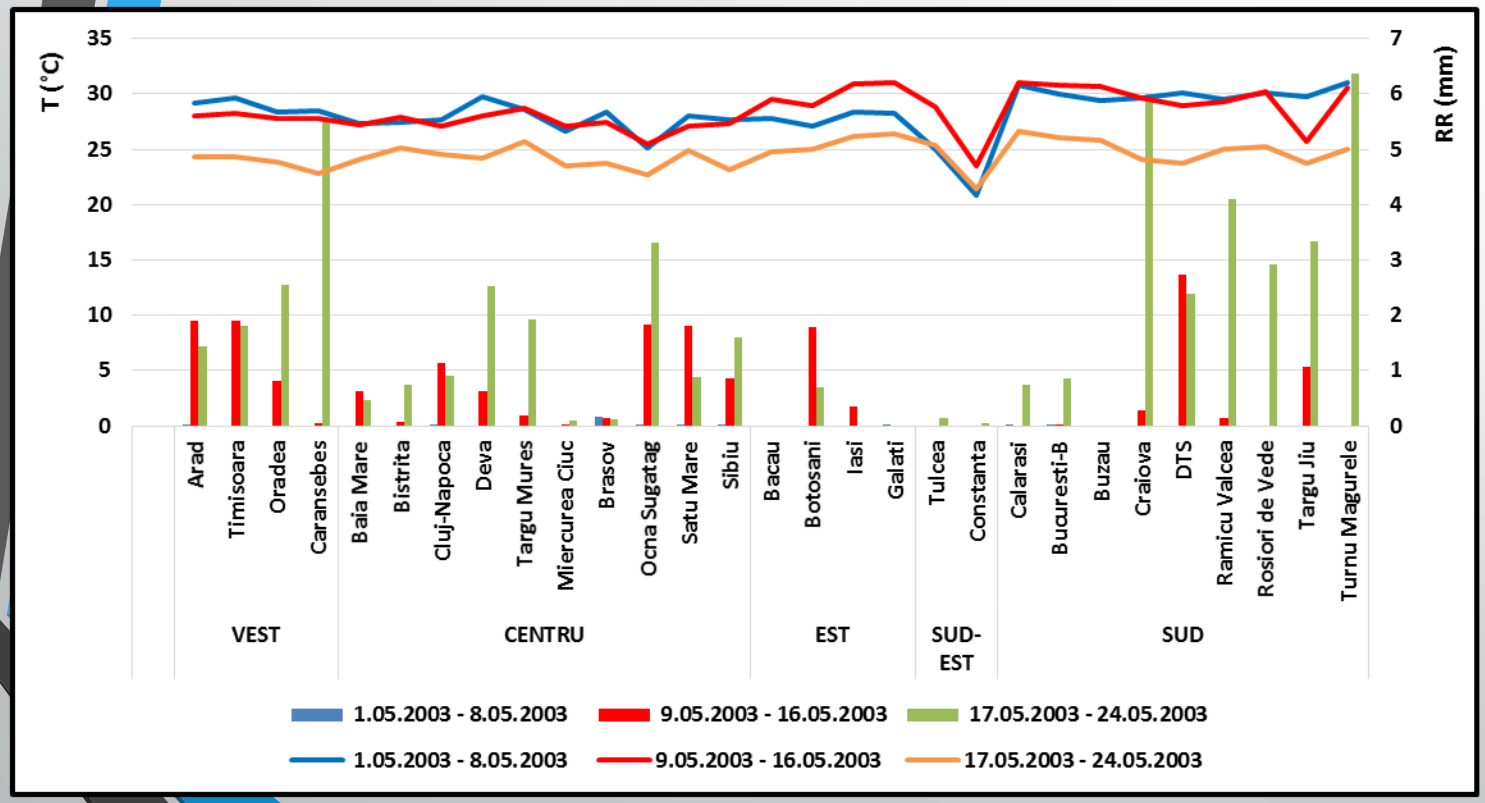
- **Dry spells:**
  - **Duration**: - at least 10 consecutive days, with 1 mm.

- **Warm spells/Heat waves:**
  - **Intensity**: - relative thresholds => 90th percentile (*low intensity*),
    - baseline period for intensity threshold: 1961-1990.
  - **Duration**: - at least three consecutive days.

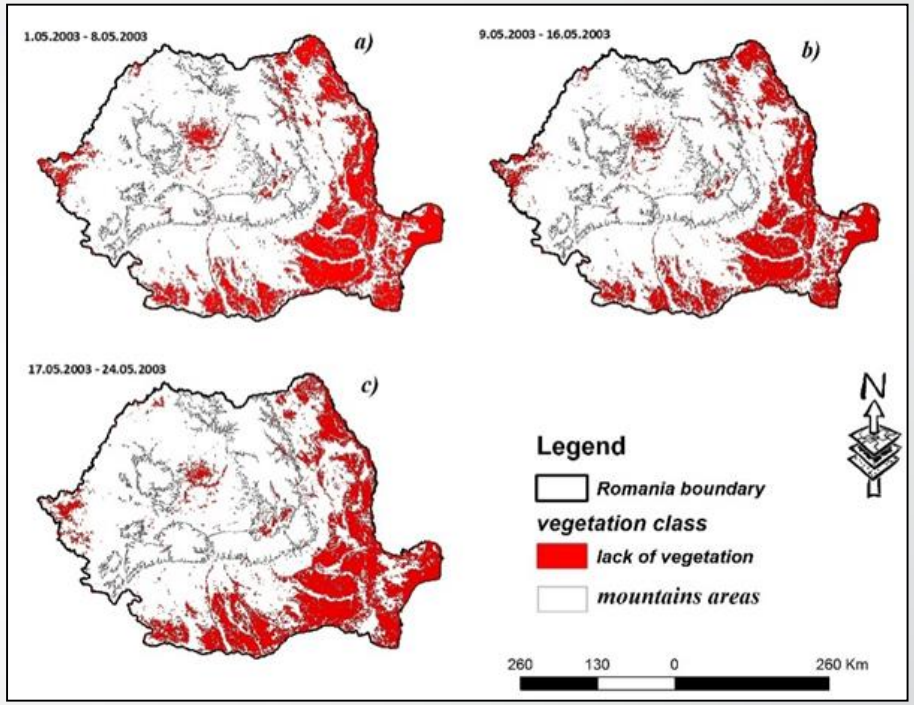
Results

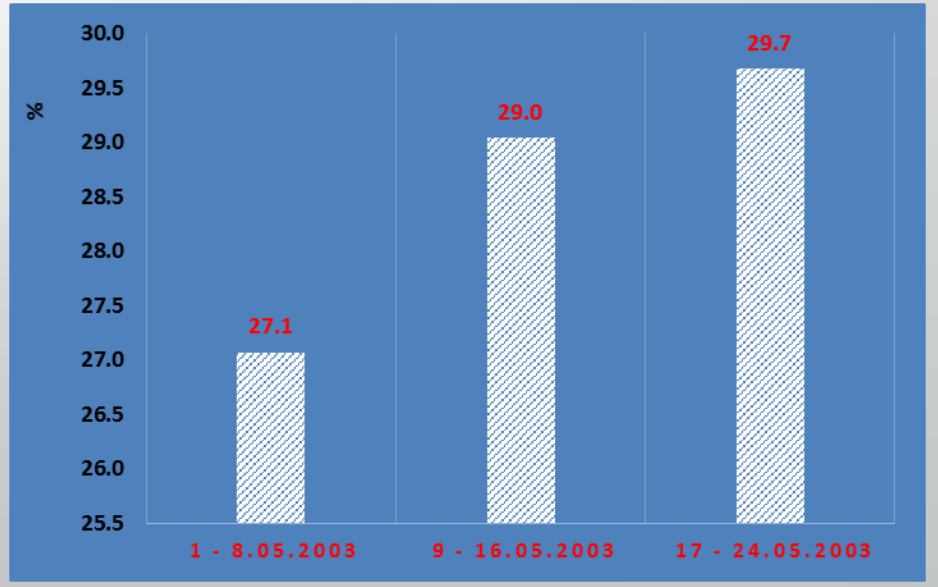
Case study – May 2003

April, 29-May 14, 2003 - period of dry spells
7-14 May 2003 - period of warm spells



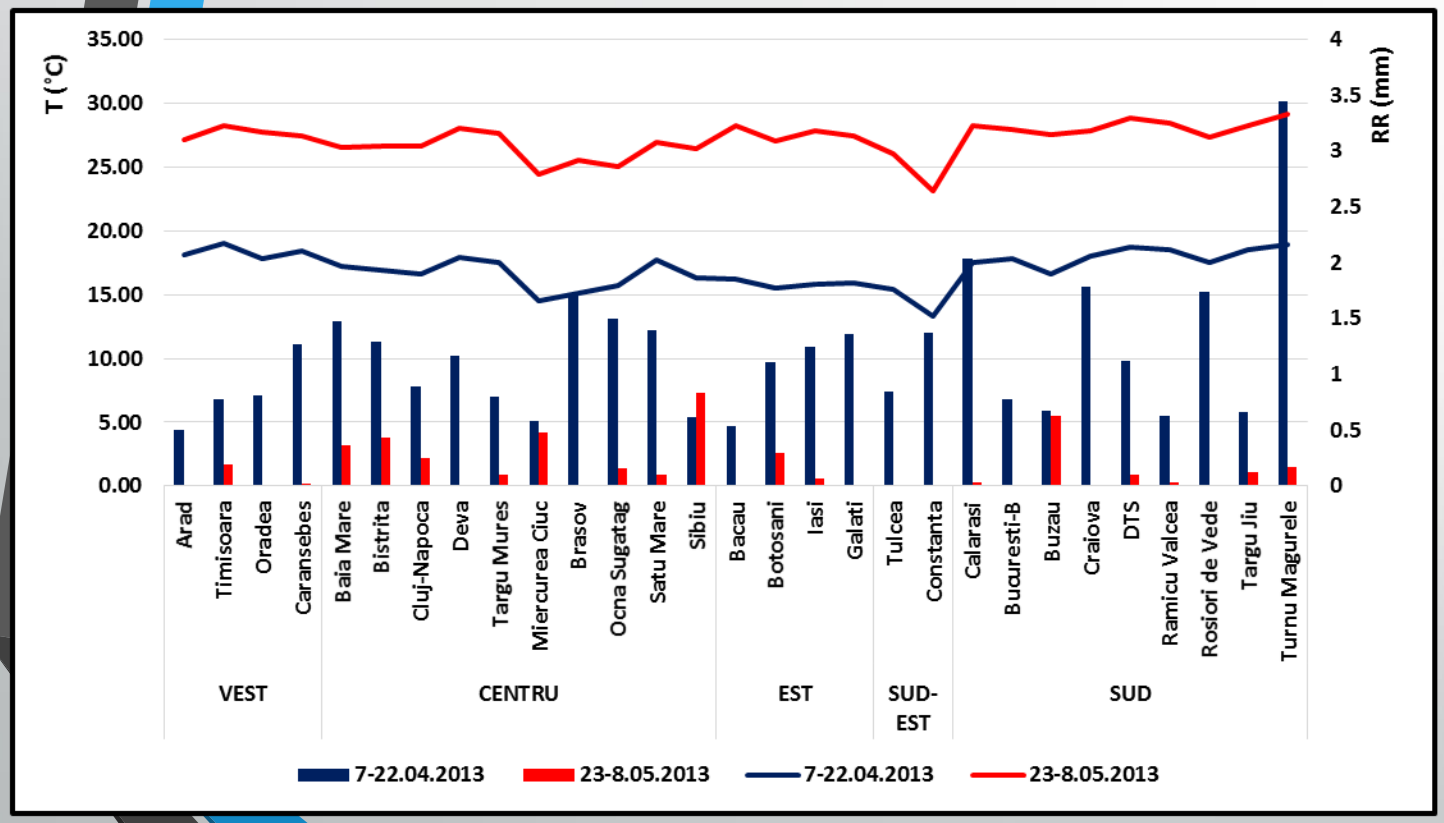
NDVI – vegetation classes



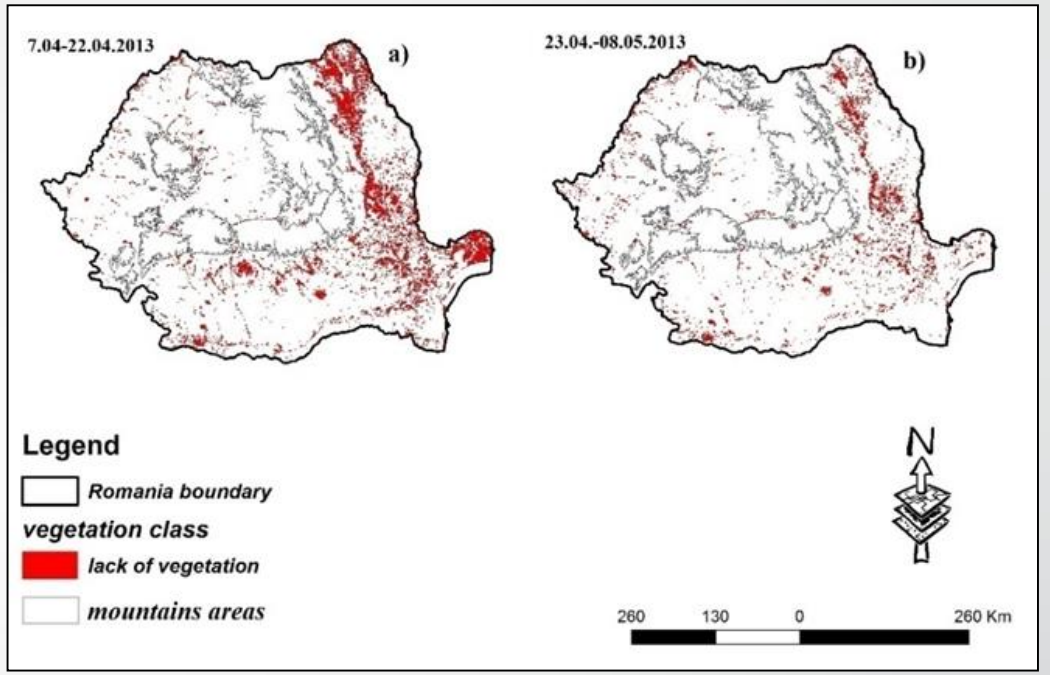


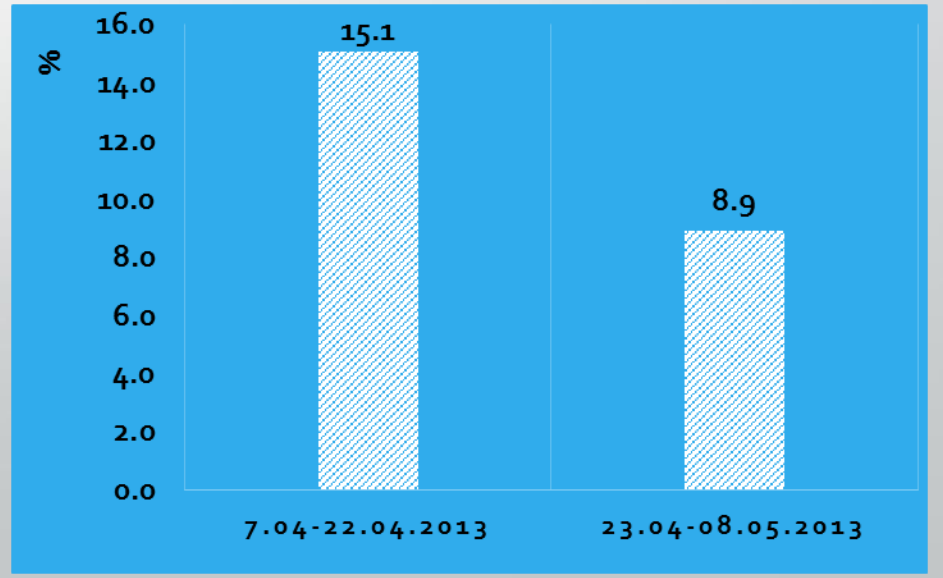
Case study – May 2013

April, 15-May 13 - 2013 period of dry spells
April, 25 – 3, May - 2013 period of warm spells



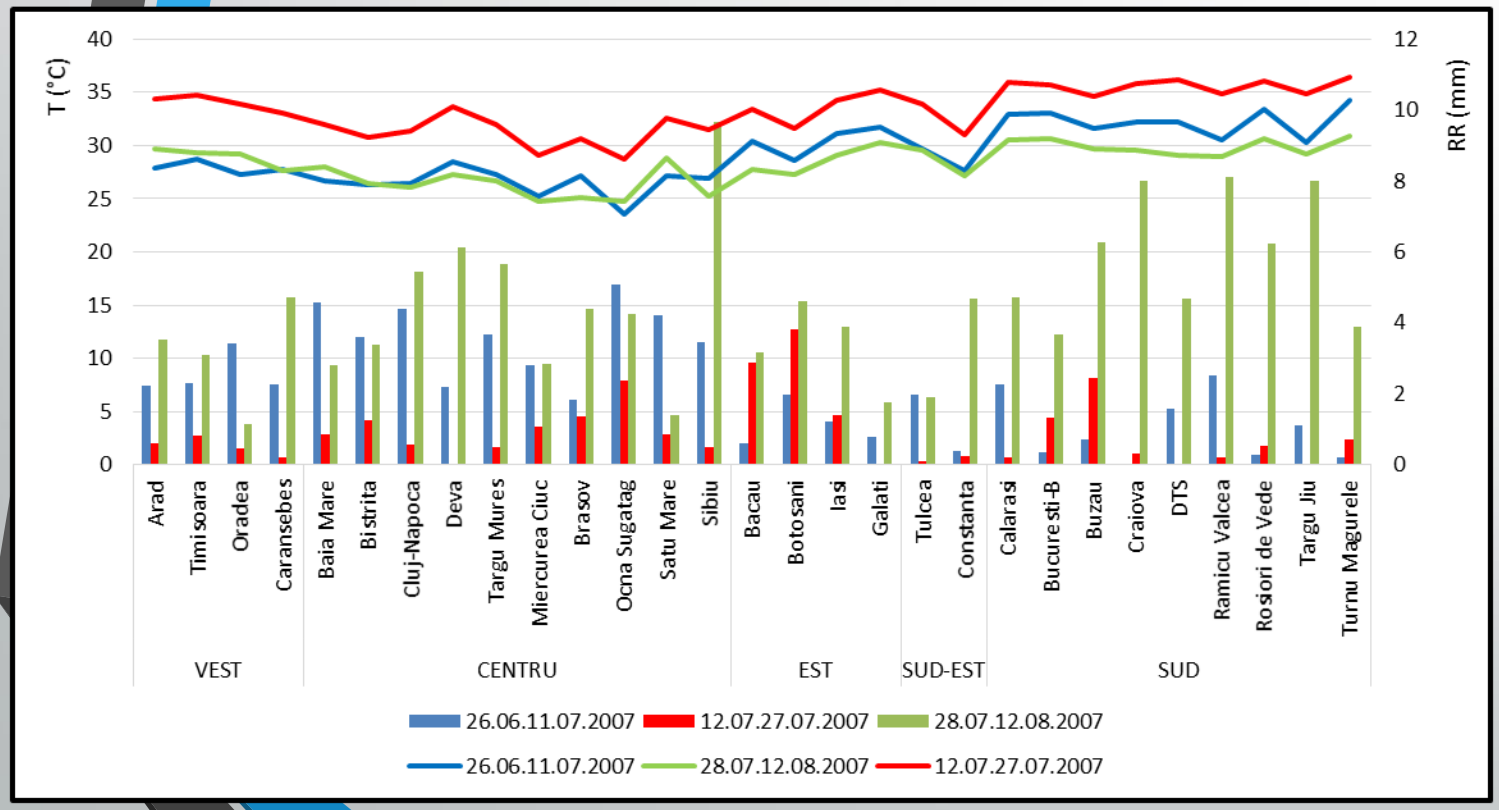
NDVI – vegetation classes



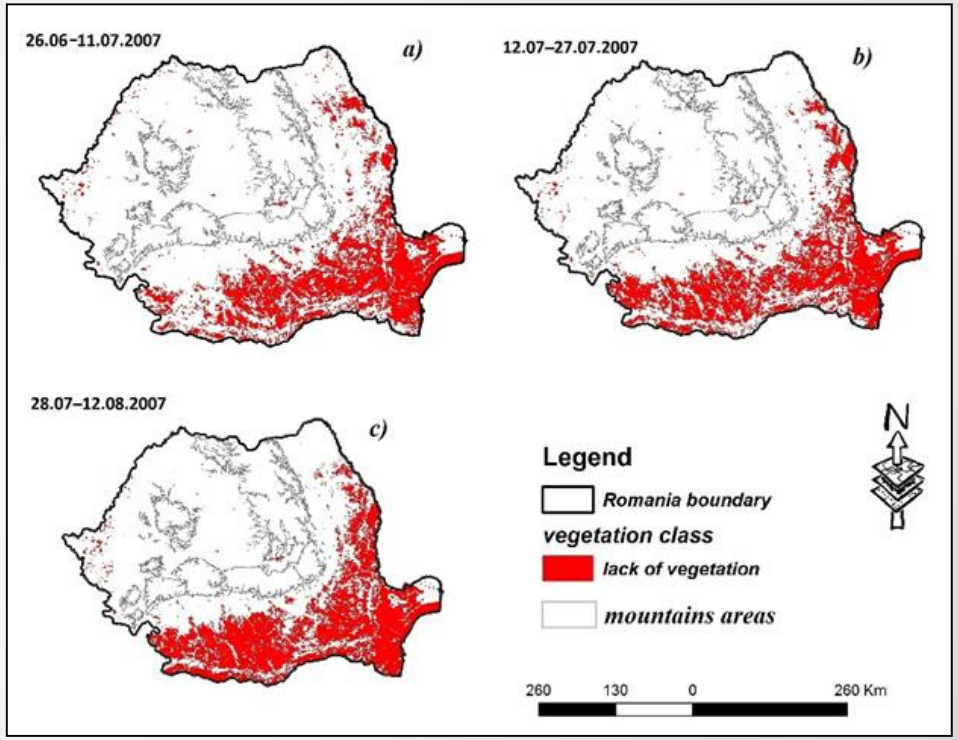


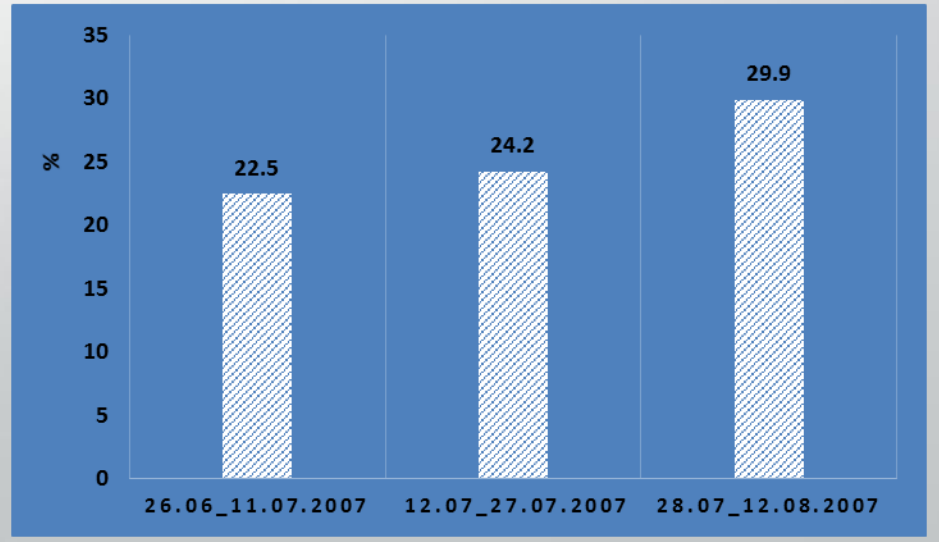
Case study – July 2007

July, 13 –July 24 - 2007 period of dry spells
July, 16 – 25, July 2007 - period of heat waves



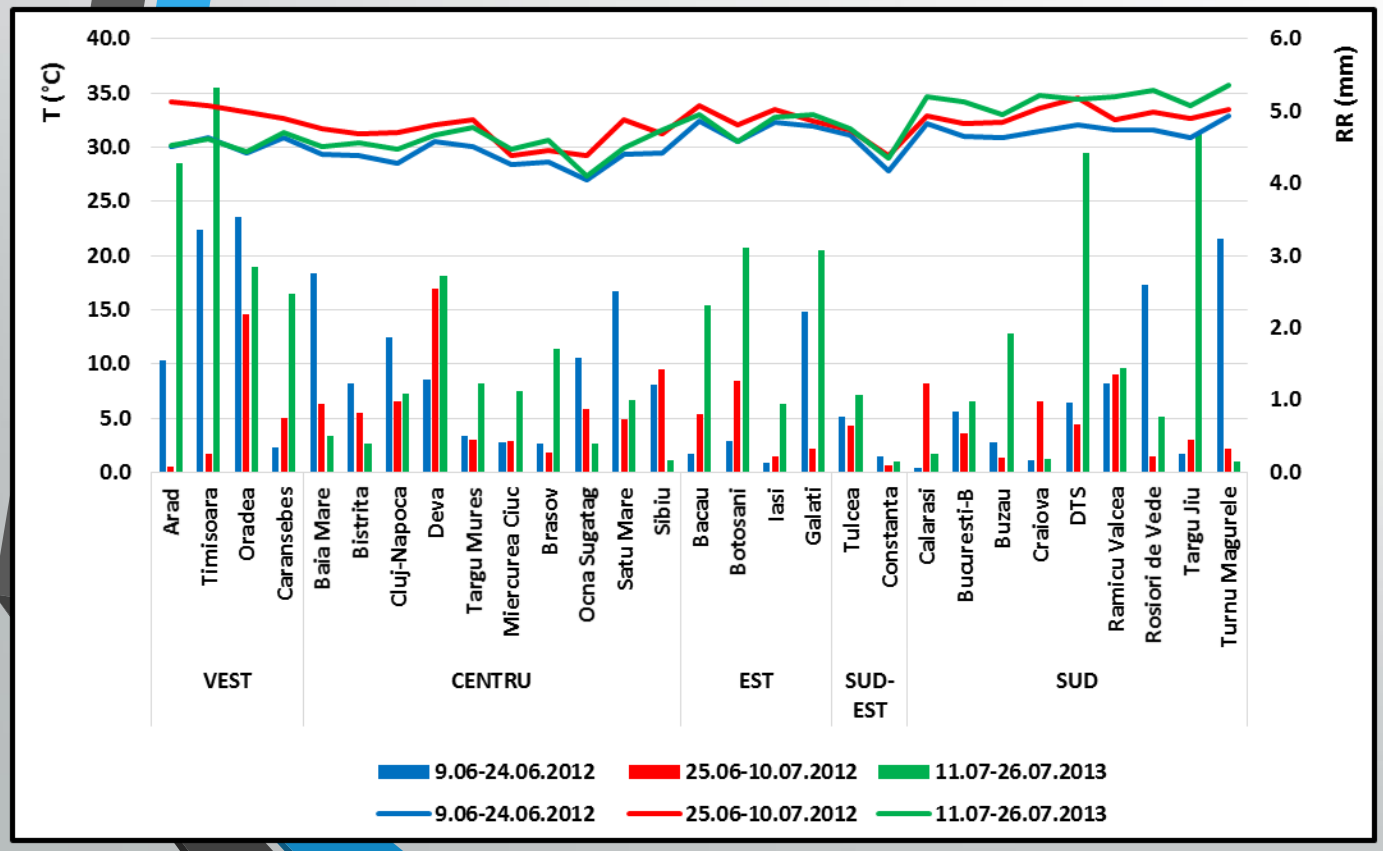
NDVI – vegetation classes



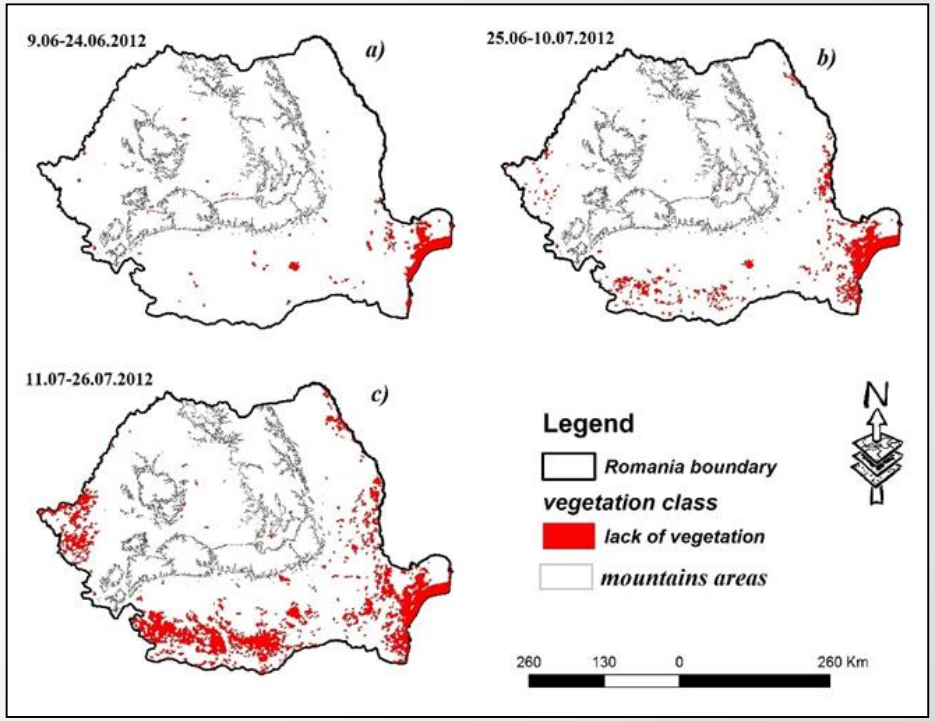


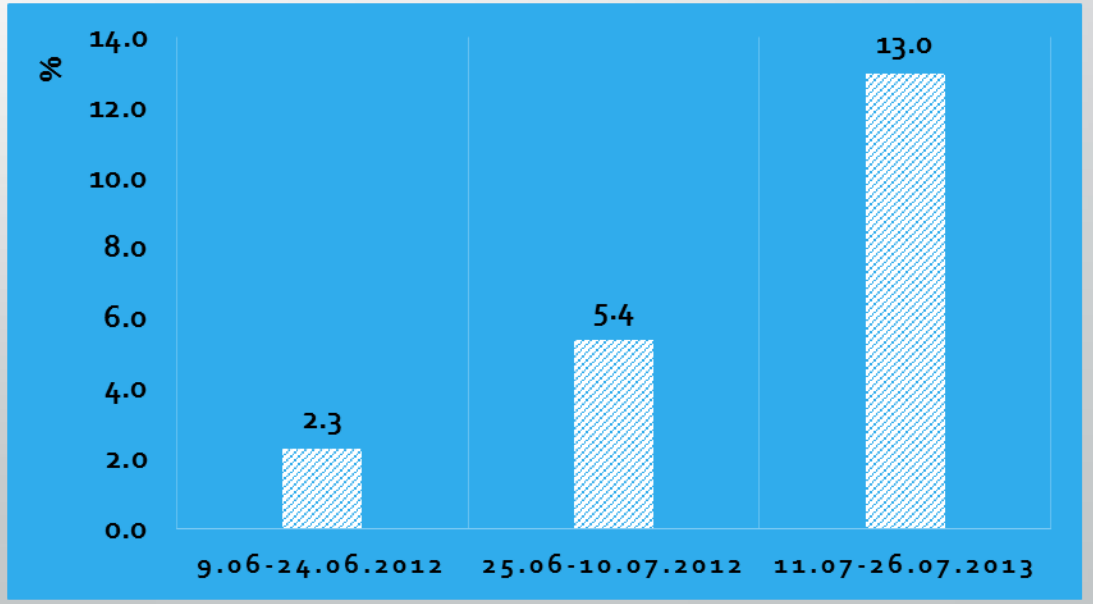
Case study – July 2012

June, 27 –July 11, 2012 - period of dry spells
July, 1 – 11, July 2012 - period of heat waves



NDVI – vegetation classes





Conclusions

- During ***spring warm spells*** the affected area in Romania was insignificant, between 0.0 and 3.0 %;
- During ***summer heat weaves*** the affected area in Romania was more three times higher, between 7.0 and 11.0 %;
- More investigations are needed in order to get more accurate results;
- The most affected areas are the eastern, southeastern, southern regions, as well as extreme West of Romania.

Acknowledgment

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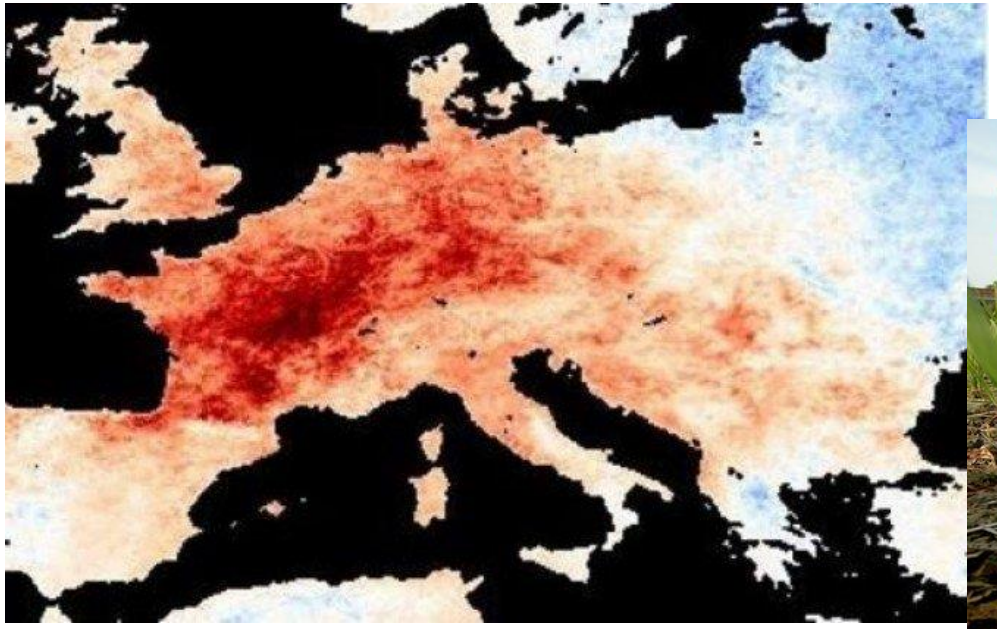

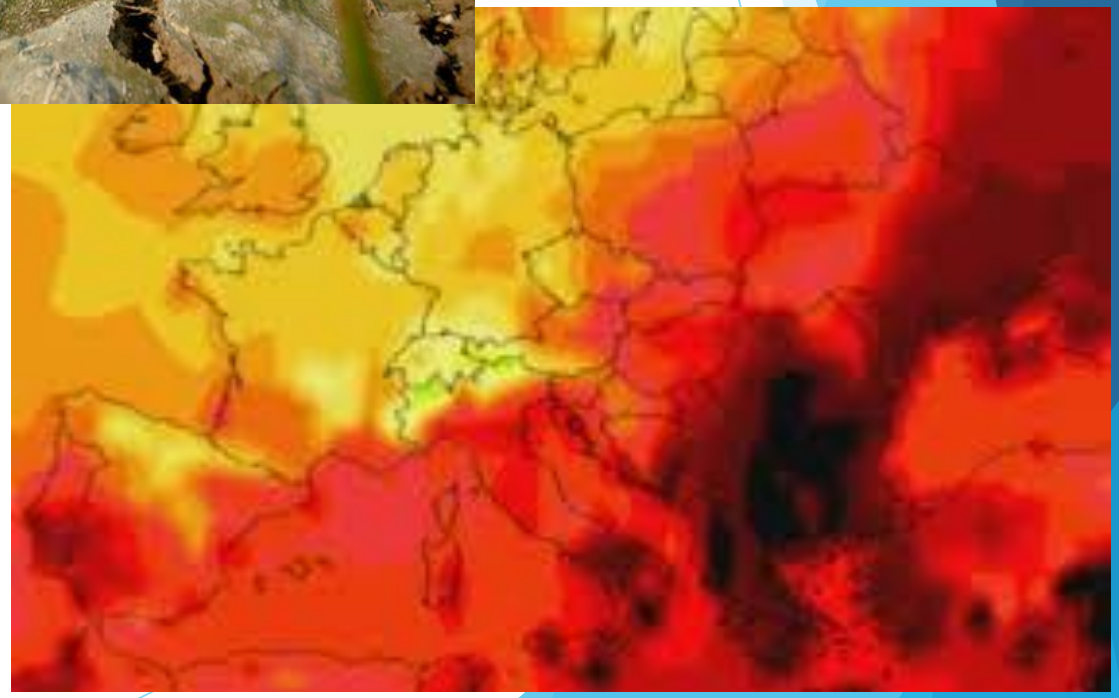

Thank you very much for your attention!