

DROUGHT MANAGEMENT IN SE EUROPE

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Workshop „Sort-out drought!“,
Dresden, November 2016



DMCSEE

*Drought Management Centre
for Southeastern Europe*

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Drought Management Centre for Southeastern Europe - DMCSEE

Drought is a normal part of climate in virtually all regions of the world. South Eastern Europe is no exception; in past decades the drought-related damages have had large impact on the economy and welfare. Therefore the need to establish a Drought Center for SE Europe to alleviate the problems caused by drought in the area became evident at the end of the past century. The idea was further elaborated by International Commission on Irrigation and Drainage (ICID) and UN Convention to Combat Desertification (UNCCD). The UNCCD national focal points and national permanent representatives with the World Meteorological Organization have agreed upon the core tasks of the Drought Management Center for South Eastern Europe (DMCSEE) and the proposed project document.

The mission of the proposed DMCSEE is to coordinate and facilitate the development, assessment, and application of drought risk management tools and policies in South-Eastern Europe with the goal of improving drought preparedness and reducing drought impacts. Therefore DMCSEE will focus its work on monitoring and assessing drought and assessing risks and vulnerability connected to drought.

[DMCSEE Project Proposal](#)

Latest news

Drought bulletin 16th May 2016
(16.05.2016)

DMCSEE in Tbilisi (Georgia) on
EUMETSAT/WMO trainig course
(13.05.2016)

DMCSEE in economic delegation of the
Slovenian Ministry for Foreign Affairs in
the Kingdom of Morocco
(11.04.2016)

Links

[» UNCCD](#)
[» WMO](#)
[» SEE TCP](#)

Founding countries:

→ Albania
→ Bosnia and Herzegovina
→ Bulgaria
→ Croatia
→ FYROM
→ Greece
→ Hungary
→ Moldova
→ Romania
→ Slovenia
→ Turkey
→ Montenegro
→ Serbia

Founding agencies:

→ WMO
→ UNCCD

www.dmcsee.org

Drought bulletin

- ✓ **Implementation of standardized precipitation index**
- ✓ **Maps of SPI, percentiles and precipitation for the SEE region**
- ✓ **Historical maps (record 1951-2000)**
- ✓ **Data origin: GPCC data/ update once per month**

DROUGHT MONITORING PRODUCTS

Using [GPCC](#) data, some preliminary maps of the SPI, Percentiles and Precipitation for the region were prepared.

Maps are updated twice per month. Final data maps with two months delay are available after 20th day of the current month. First-guess maps are available after 5th day of the next month.

Final data are available from *January 1986*, first-guess from *August 2004*. For period 1951-2000 maps are available [here](#).

Latest maps for **2010** are available below.

SPI

One of the most robust drought indices is so called Standardized Precipitation Index (SPI). The SPI can be calculated at various time scales which reflect the impact of the drought on the availability of water resources. The SPI calculation is based on the distribution of precipitation over long time periods (30 years (1961-1990) was used). The long term precipitation record is fit to a probability distribution, which is then normalised so that the mean (average) SPI for any place and time period is zero.

SPI values above zero indicate wetter periods and values less than 0 indicate drier periods.

Please select year, month, time scale and data type:

2014 January 1 month
☐ first-guess
☐ final

[Submit>>>](#)

Percentiles and precipitation

Another way to define drought are percentiles. A percentile is the value of a variable below which a certain percent of observations fall. Long term precipitation record is sort by rank by month; 50 years period (1951-2000) was used. The 5th (10th, 15th etc.) percentile is the value below which 5 (10, 15 etc.) percent of the observations may be found. The 25th percentile is also known as the first quartile; the 50th percentile as the median.

Percentile values above 50 indicate wetter periods and values less than 50 indicate drier periods.

Please select data, year, month and data type:

Percentiles 2014 January
☐ first-guess
☐ final

[Submit>>>](#)



Drought bulletins and maps

RASTER DATA DOWNLOAD

WCS enables you to [download raster data](#) in TIFF and PNG format. These services are useful for performing analyses of drought-related resources in specific software as the functionality of analysing raster maps in a map viewer is limited. You can select SPI on different time scales and WBA (Water balance anomaly) on two months time-scale, provided by NWP.

DROUGHT BULLETINS

Basic information on drought in the current season are summarized in [drought bulletin for SE Europe](#). Drought bulletin is being published since spring 2010 and can be found by following this link:

[Drought Bulletin for SE Europe](#)

DROUGHT MONITORING PRODUCTS

Drought Bulletin for SE Europe

- **Hot spot** - short summary, short insight of possible circumstances of drought at the time of issue.
- Additional and auxiliary information (such as methodology used, more detailed information on water balance or temperature situation)
- **Report on drought impacts (more about agricultural drought impacts is missing!)**
- **Outlook**

Check new bulletin issued on November 4, 2016 on web page



DROUGHT MONITORING BULLETIN

4th November 2016

HOT SPOT

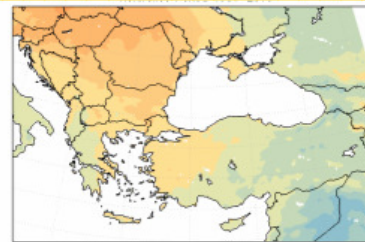
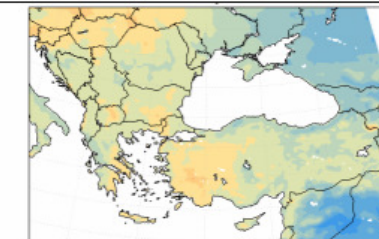


Figure shows mean monthly air temperature anomalies recorded in September (reference period 1981–2010). Major part of Balkan Peninsula experienced above average air temperatures for at least 1 °C, with the exception of Greece and Albania. Anomalies in central and eastern Peninsula were up to 2 °C and at the north of the region, even up to 3 °C above the long-term average. Meanwhile Turkey had warmer western and colder eastern part, where mean monthly air temperatures decreased up to 2 °C below the long-term average.

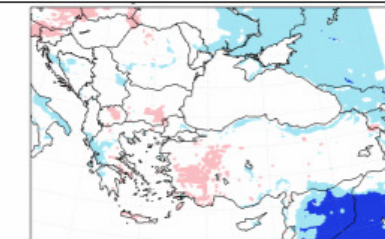
AIR TEMPERATURES AND SURFACE WATER BALANCE

Figures in this section present anomalies of the average air temperature and accumulated water balance and classified values of average air temperature and water balance in percentile classes for 60-days period from 29th August to 27th October 2016.

AVERAGE AIR TEMPERATURE ANOMALY (°C)
29th AUGUST – 27th OCTOBER 2016



AVERAGE AIR TEMPERATURE PERCENTILE CLASSES
29th AUGUST – 27th OCTOBER 2016



The latest 60-day accumulated average air temperatures (from 29th August to 27th October) were in the major part of the region in normal range. Cold period in the whole region occurred in the third decade of the September, later on colder and warmer periods have changing across the region. It warmed up at the end of October in the major part of the Balkan Peninsula.

Recent developments –

Application of remote sensing data - EUMETSAT LSA SAF products

(Satellite Application Facility on Land Surface Analysis)

- FVC (Fraction of Vegetation Cover) can be used to detect “green” vegetation
- LSA SAF product – spatial resolution cca 4 km
- Vineyards – one of best options form homogene cultivated area in Slovenia



Vegetation indices found useful for monitoring possible drought-induced vegetation stress

FVC and LAI preferred over NDVI (possible ground truth)

LSA SAF valuable auxiliary information (despite coarse resolution)

Currently, most valuable information deduced from point time series. Need for objective recognition of drought patterns.

Recent developments –

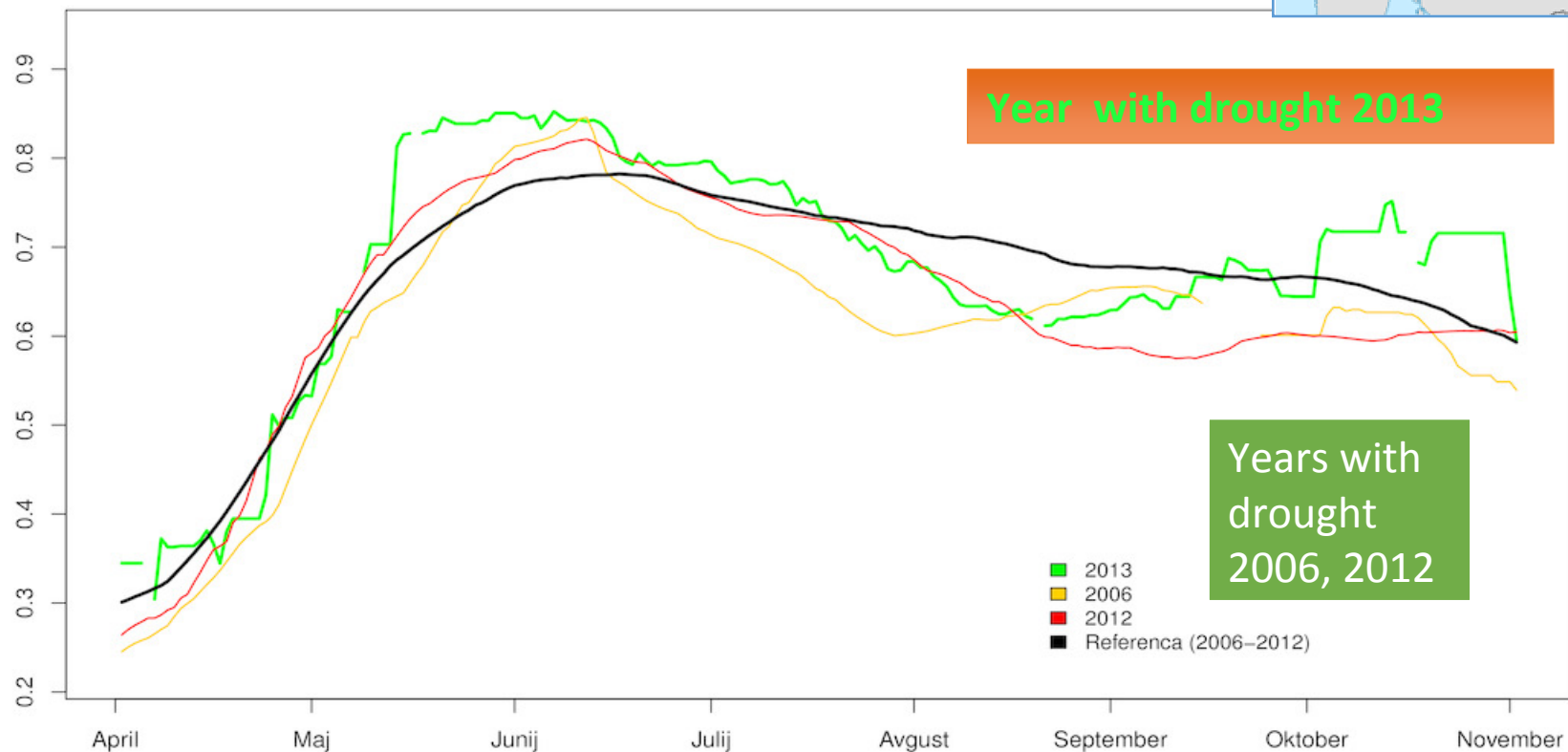
Application of remote sensing data in SLOVENIA –

EUMETSAT LSA SAF products

- reference allways needed for drought detection!

© ARSO/EUMETSAT

Indeks FVC: Nova Gorica (20131031)



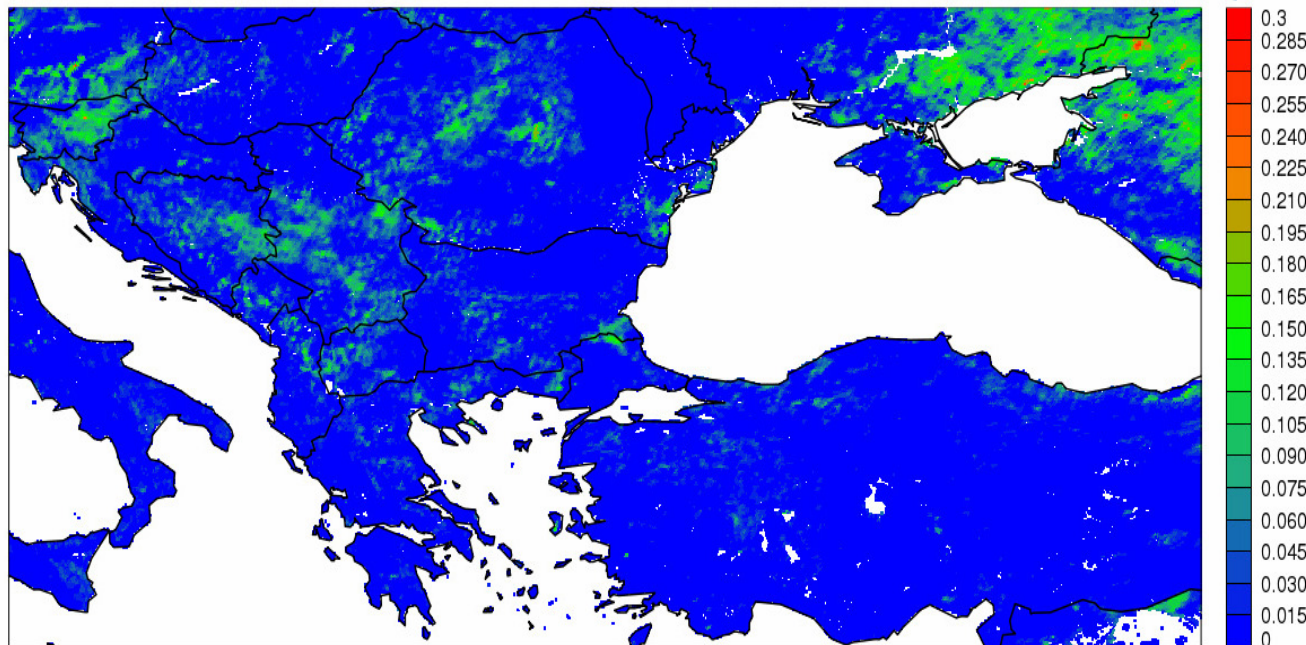
Drought monitoring application of remote sensing data

Accumulation of FVC anomaly – example of drought 2013

Summer 2013

EUMETSAT

Monthly FVC Accumulations (20130729 - 20130827)



Up to 30 %
deviation of
vegetation
cover

- difference to last 5 year
average-computed from
available archive (Fraction of
vegetation) EUMETSAT's
LandSAF
- shows the (difference to 5
year average) – eastern
Slovenia.

- mapping on DMCSEE domain
- no separation between agricultural pixels and other land use

Check on the web FVC situation in
May 2016

Drought monitoring application of remote sensing data

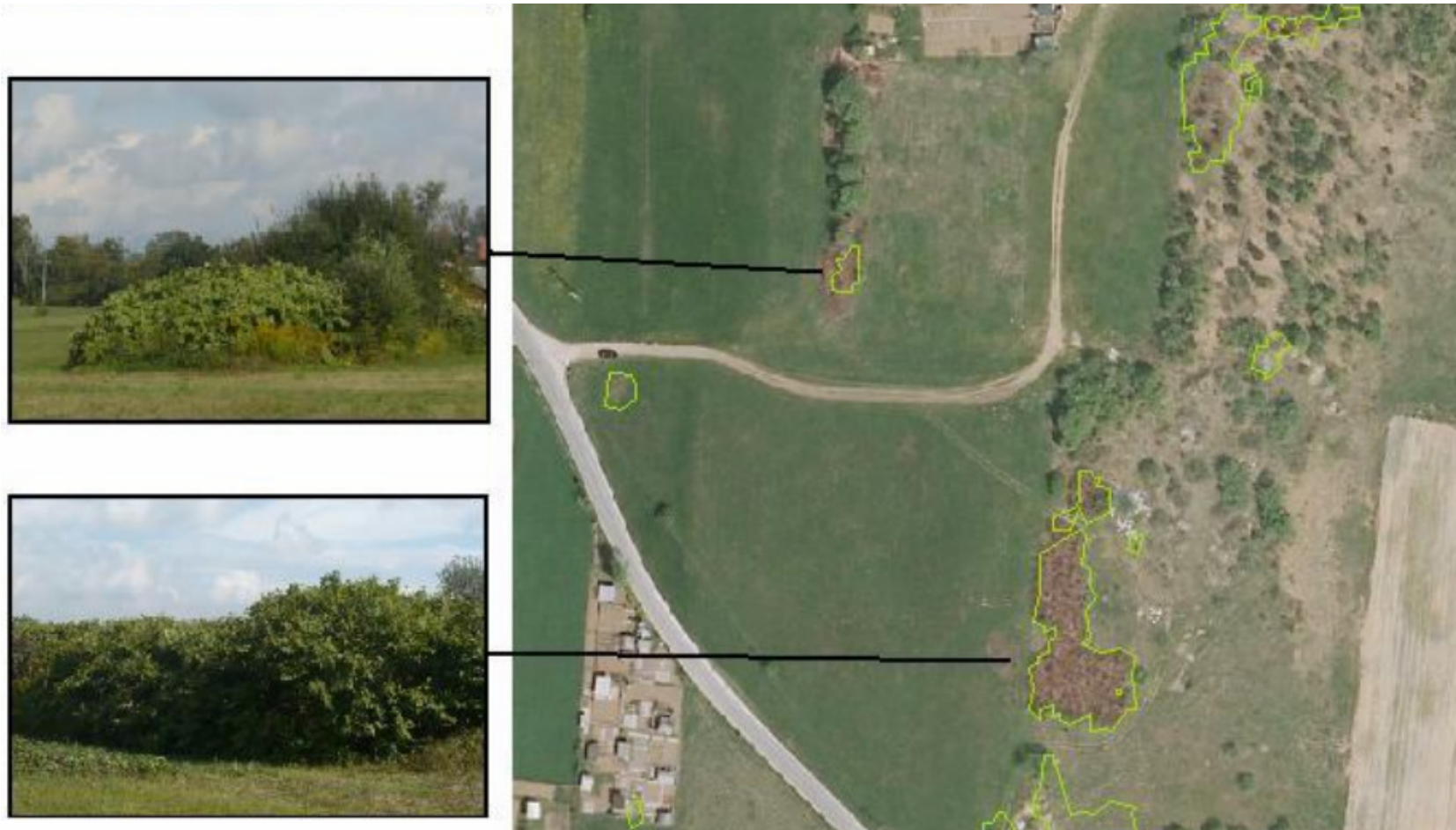
According to user requirements (agricultural administration!) much higher resolution is needed!

Example of existing practice:

**Detection of invasive species
(*Fallopia japonica*)
on agricultural plots.**

Main disadvantage:
High cost of commercial
hi-res data

(drought monitoring
requires frequent sampling!)



Drought monitoring application of remote sensing data

Sentinel-2

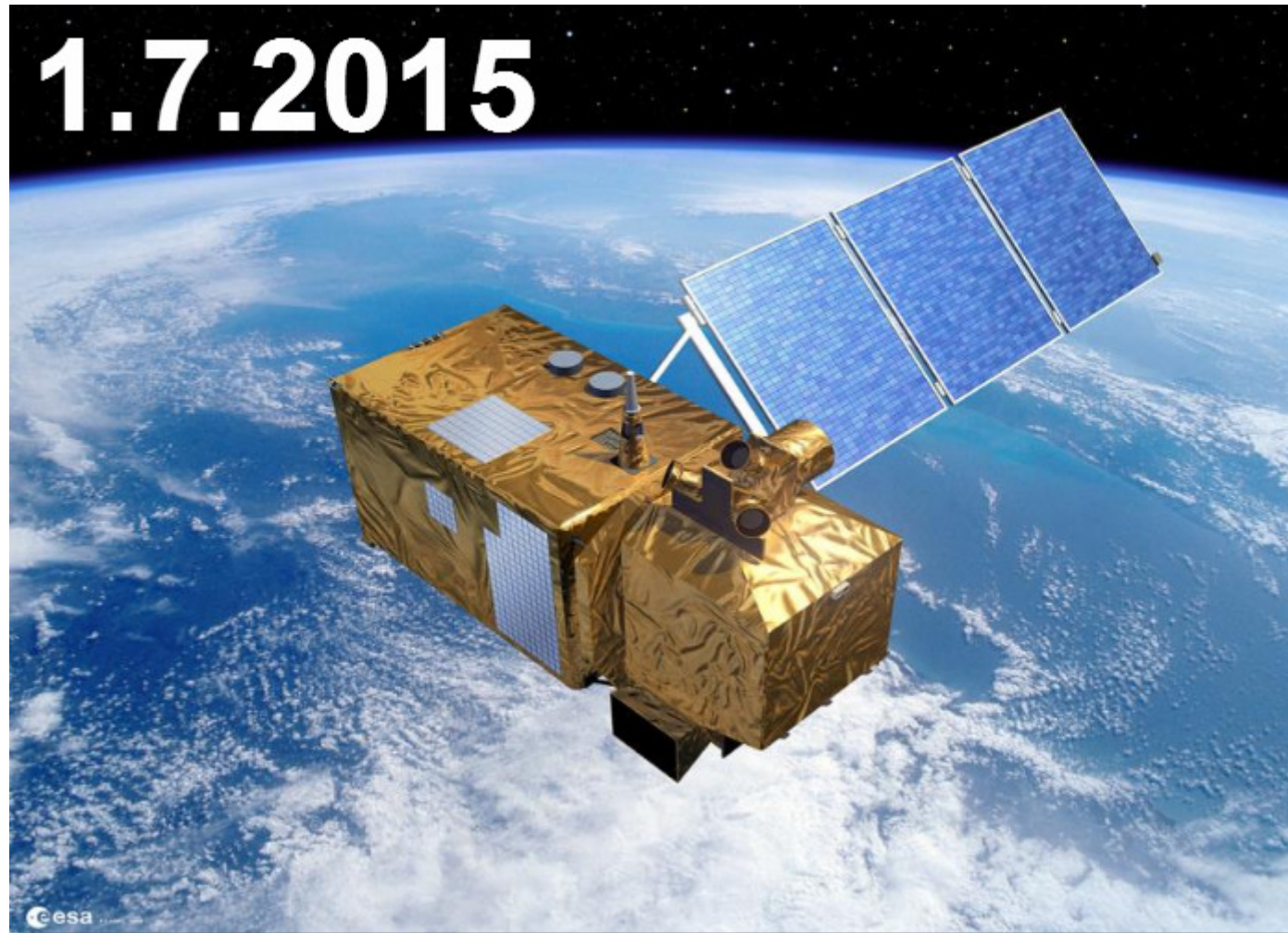
Temporal resolution: 5 days

Spatial resolution: 10m

No. of channels: 13

Cost of data: **free**

Next steps toward applications:
We need a project!



DriDanube Drought Risk in the Danube Region

Project proposal submitted to the 1st Call of the Danube Transnational Programme
APPROVED – 27. September 2016 (with conditions)

Lead Partner: Slovenian Environment Agency / DMCSEE



7 EU countries
3 Non-EU countries

14 partners
9 ASP partners

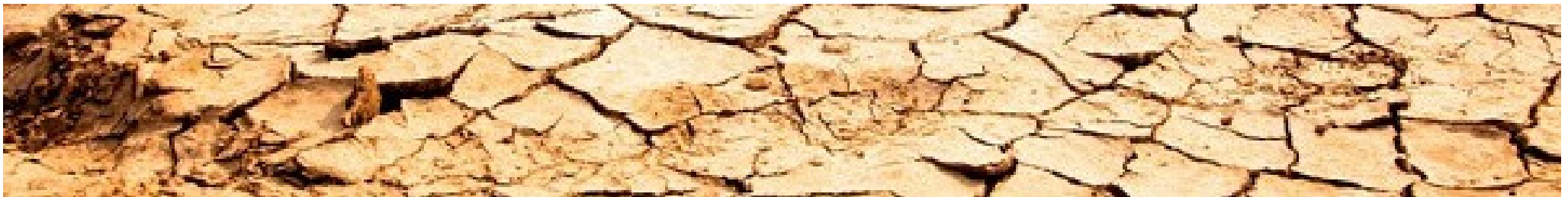
Project budget: 1.974.750,00€

Duration of project: 30 months

Expected kick-off: January 2017

General and specific objectives

- Project aims to increase the capacity of the Danube region to adapt to climatic variability **by enhancing resilience to drought** with recently developed tools and data sets;
- **New drought monitoring services** will be developed and prepared for operational use;
- **Unified drought risk protocol** based on the Civil Protection Mechanism will be prepared;
- **Improve drought emergency response in the Danube region.**



DRiDanube - Drought Risk in the Danube Region

WP3 – Drought User Service

- Developing a service based on most advanced available infrastructure (remote sensing data)
- Supporting development of drought monitoring and risk assessment tool (User Service & trainings)

WP4 – Drought Impact Assessment

- Preparation of common methodology for near real-time drought impact assessment including forecast
- Regional capacity building

WP6 – Drought Preparedness Improvement

- Pilot implementation of Drought User Service and Decision Making Model National capacity building
- Strategy to improve drought emergency response in the Danube Region

WP5 – Drought Risk Assessment

- Preparation of common methodology for drought risk assessment – based on EU Guidelines
- Evaluation and mapping of risk

Project partners

EODC Earth Observation Data Centre GmbH (Austria) – WP3 leader

Global Change Research Centre AS CR, v.v.i. (Czech Republic) – WP4 leader

Global Water Partnership Central and Eastern Europe (Slovakia)

Hungarian Meteorological Service (Hungary) – WP5 leader

Vienna University of Technology (Austria)

Szent Istvan University (Hungary)

National Meteorological Administration (Romania)

SPACE-SI, Centre of Excellence for Space Sciences and Technologies (Slovenia)

Meteorological and Hydrological Service (Croatia)

Slovak Hydrometeorological Institute (Slovakia)

Faculty of Agriculture, University of Novi Sad (Serbia)

Republic Hydrometeorological Service of Serbia (Serbia)

Republic Hydrometeorological Service of Republic of Srpska (BiH)

Institute of Hydrometeorology and Seismology (Montenegro)





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Next steps

DriDanube kick-off conference early next year (probably March?)

Expect invitations!