



REPUBLIC OF SLOVENIA
MINISTRY OF AGRICULTURE AND THE ENVIRONMENT
SLOVENIAN ENVIRONMENT AGENCY



DMCSEE
*Drought Management Centre
for Southeastern Europe*



DMCSEE - Activities and Potential Cooperation

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**4th meeting of the Carpathian Convention WG on Adaptation to
Climate Change,
Szolnok, Hungary, 30 September – 2 October 2015**



Drought – increasing risk in SE Europe



Drought management center for SE Europe



Drought watch - cornerstone of drought management



DMCSEE & Carpathian Convention cooperation?

Drought reality 2000–2012 and again 2015

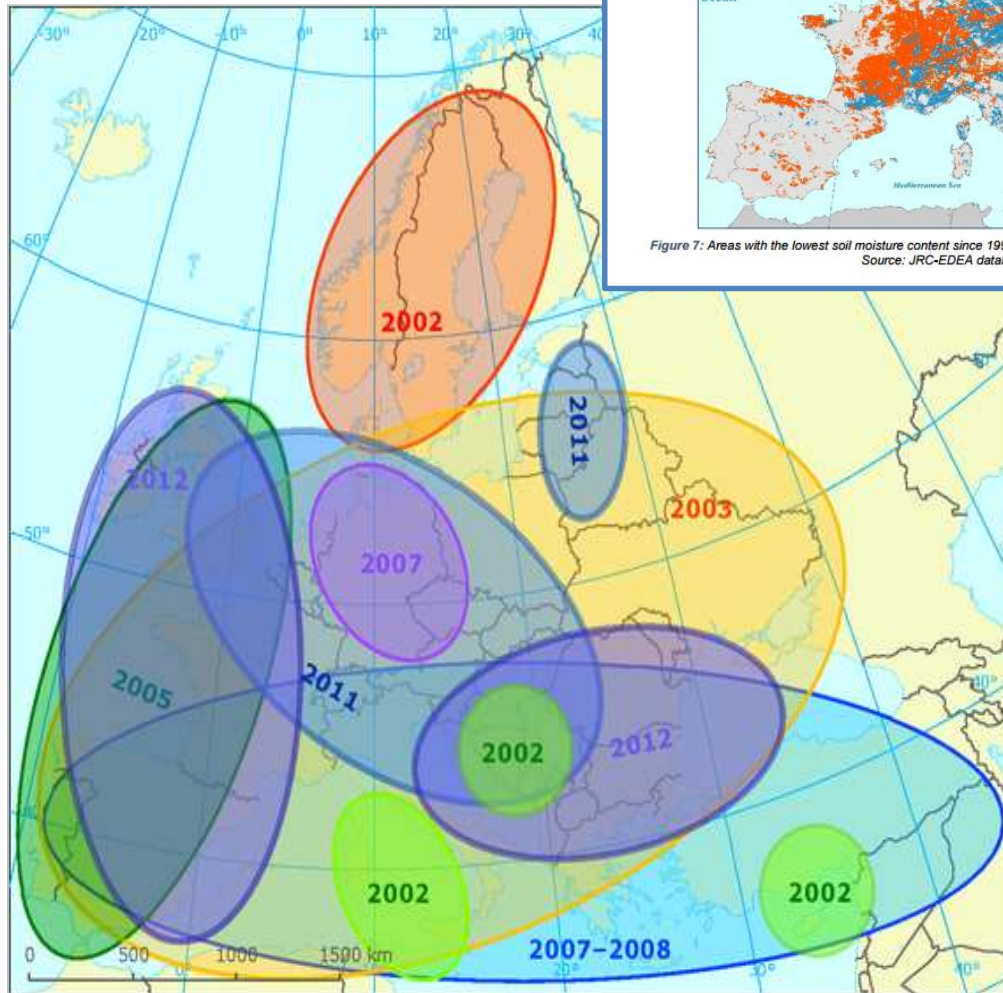


Figure 7: Areas with the lowest soil moisture content since 1990 in July 2015 (in red) and in July 2003 (in blue).
Source: JRC-EDEA database (EDO)

- Europe has been affected by several major droughts in recent decades.
- Severity and frequency of droughts appear to have increased in parts of Europe, in particular in **southern and south-eastern Europe.**

(EEA ..., 2012)



*2012 InterGovernmental Panel on Climate Change (IPCC,2012)
Special Report on Managing the Risks
of Extreme Events and Disasters to Advance
Climate Change Adaptation*

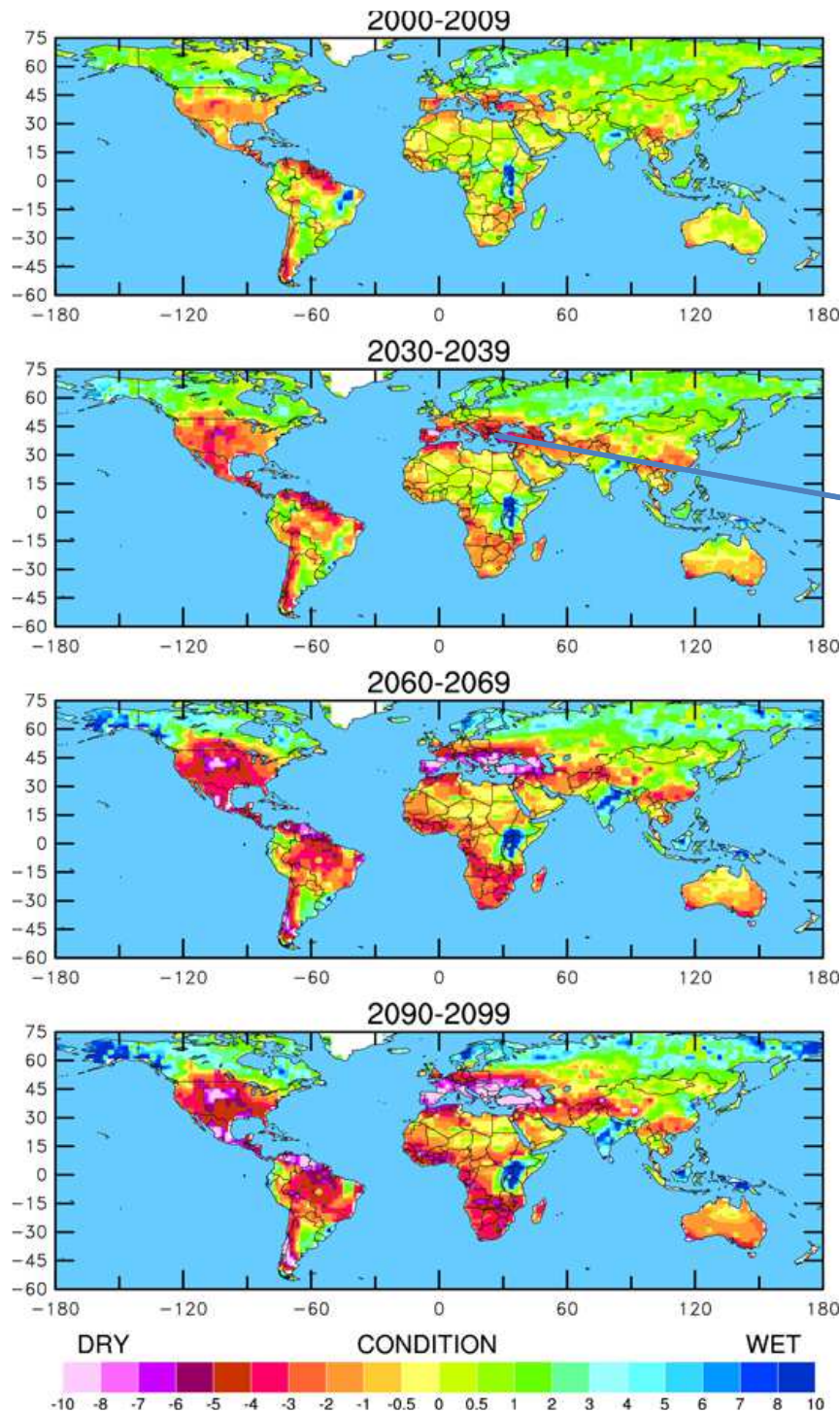
*2011 UNISDR Global Assessment Report on Disaster
Risk Reduction, Revealing Risk,
Redefining Development*



Drought-prone areas

- There is *medium confidence* that droughts will intensify in the 21st century in some seasons and areas, due to reduced precipitation and/or increased evapotranspiration.
- This applies to regions **including southern Europe and the Mediterranean region, central Europe**, central North America, Central America and Mexico, NE Brazil, and S Africa.

Higher drought risk in SEE in the future?



Regions bordering the Mediterranean Sea, which could become especially dry

- Palmer Drought Severity Index assigns positive numbers when conditions are unusually wet for a particular region, and negative numbers when conditions are unusually dry.
- A reading of -4 or below is considered **extreme drought**.
- Regions that are blue or green will likely be at lower risk of drought.

(Dai, 2012; cit. Drought may ...,2012)

Drought enigma

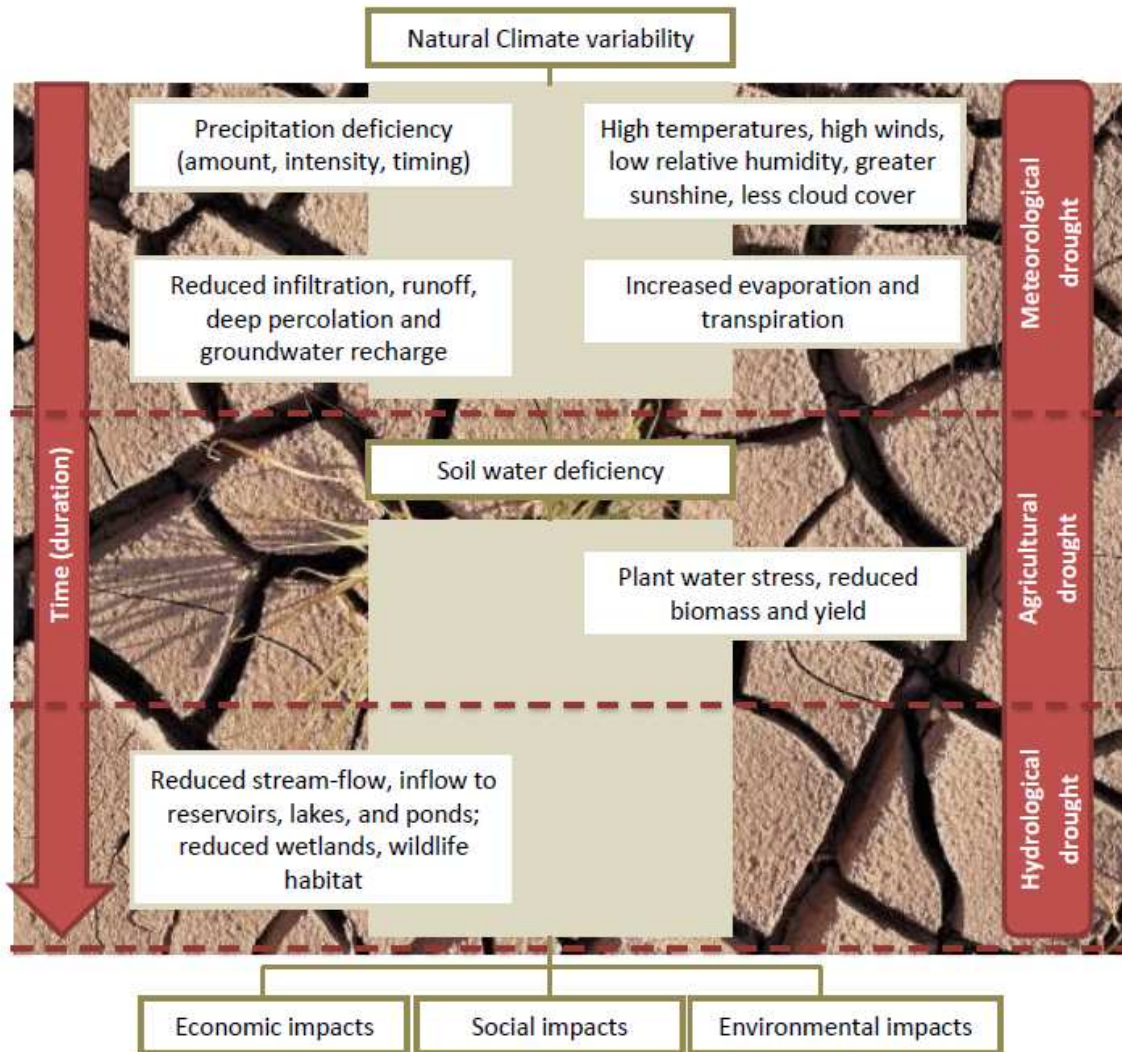


Figure 1: Sequence of drought occurrence and impacts for commonly accepted drought types (Source: National Drought Mitigation Center, University of Nebraska-Lincoln, USA)

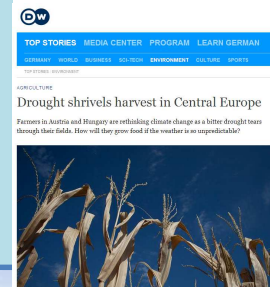
(figure modified by Horion, 2012)



Regional multisectoral drought impacts

Vir: Tuzla – problemi sa vodoopskrbo. Sutra, 2011

In past decades the drought-related damages in the region of South-Eastern Europe (SEE) have had large impact on the economy and welfare, **mainly reflected in destroyed crops and devastated farmland**, disturbed water-supply, hydroenergy, transport, ...



Suša na Balkanu povzročila vsaj milijardo evrov škode

Celotna regija že več tednov ni imela dežja, temperature pa so se povzpele preko 40 stopinj Celzija.

PI, K, Delo.si
sob, 25.08.2012, 13:43



Foto: Jože Suhadolnik / Delo

Beograd. Zagreb. Sarajevo - Balkan letos pesti

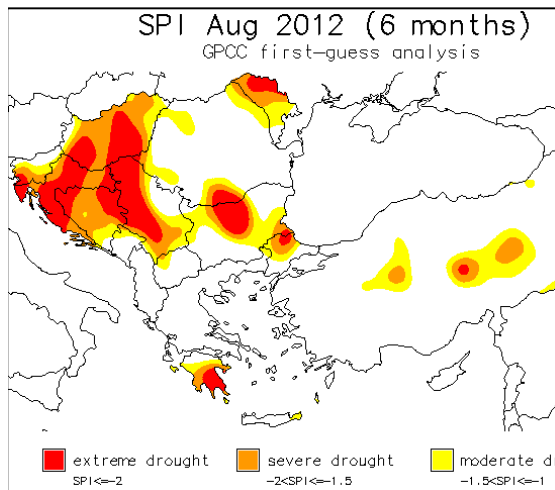
Suša "gasi" svetla na Balkanu

Amerik M. | Četvrtak, 06. Septembar 2012 11:08

Sviđa mi se Pošaji Budi prvi među svojim prijateljima kome se ovo sviđa.



bh reporter



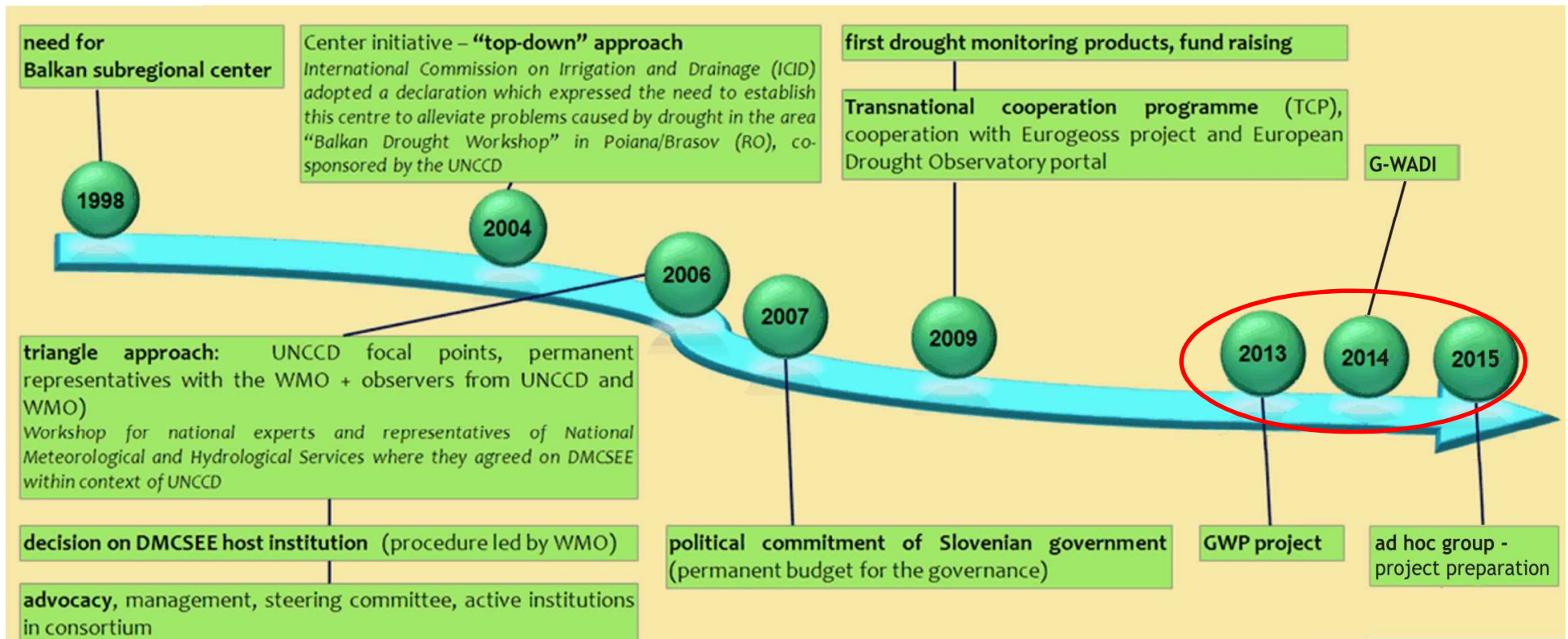
Tanjug (Jaroslav Pap)



Tanjug, avgust 2012



Jutarnji



DMCSEE course of activities 2013-2015





DMCSEE

Drought Management Centre
for Southeastern Europe



- Home
- Drought monitor**
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- TCP project
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- SQ
- BG
- HR
- MK
- HU
- RO
- SI
- TR
- SR
- EN

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 10th September 2015
(11.09.2015)

Drought bulletin 12th August 2015
(13.08.2015)

Drought bulletin 15th July 2015
(16.07.2015)

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

13
countries

WMO FP

UNCCD FP

Drought researcher

www.dmcsee.org

Drought monitor – focus on meteorological drought

- ✓ 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

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

DMCSEE
Drought Management Centre
for Southeastern Europe

UNCCCE

Home **Drought monitor** Events Links Members section TCP project News Contacts

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

Short term forecast

Outlook (up to 10 days ahead)
NWP model forecast

Real time monitoring

SPI index (GPCC)
Station data (Slovenia only)
NWP analysis:
- precipitation anomaly
- water balance anomaly
Remote sensing: LSA-SAF

Long term forecast

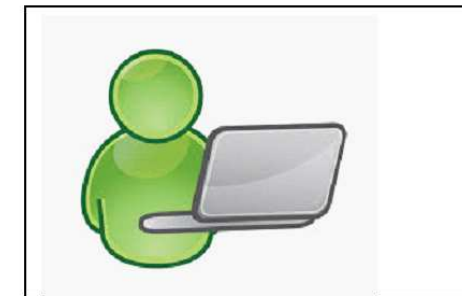
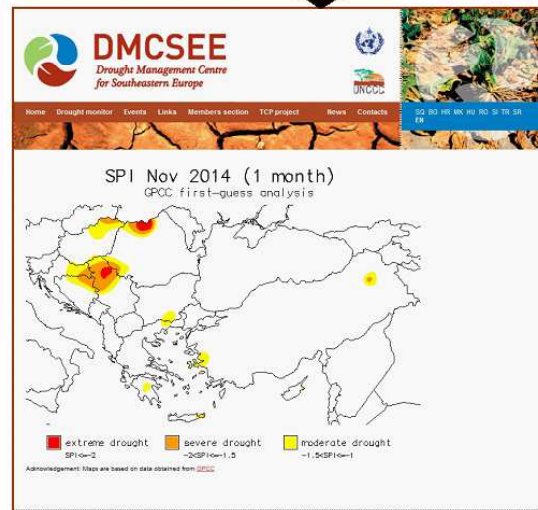
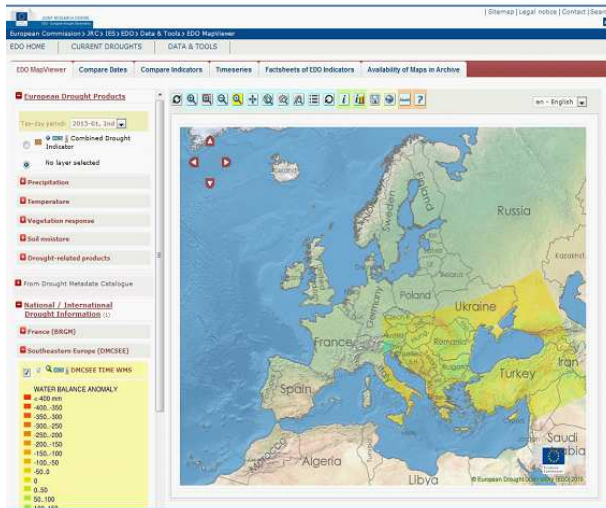
Not operational
Cooperation with VCCC
(Serbia)

International exchange (EDO)

Database Map server

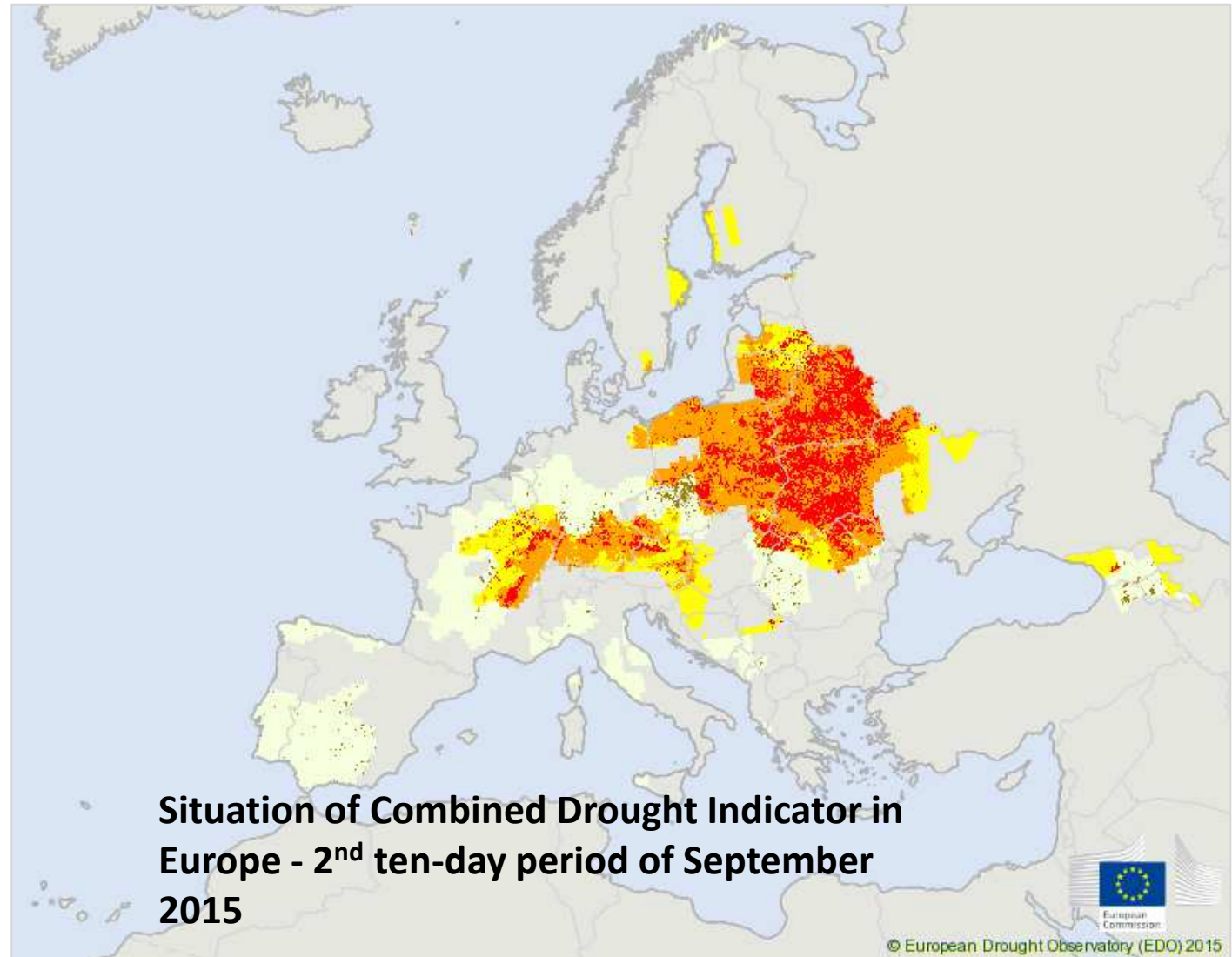
Historical reconstruction

Station and raster archive
Impact archive



Drought 2015 through EDO MapViewer/DMCSEE

Interoperability;
INSPIRE Directive
– infrastructure for
Spatial Information
in Europe



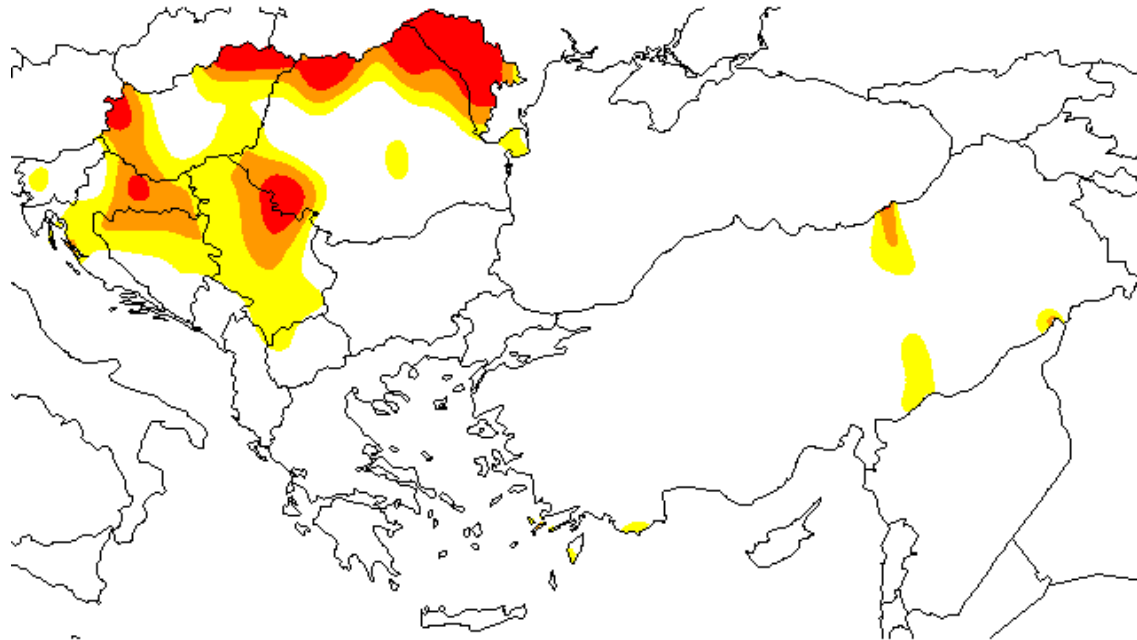
**Situation of Combined Drought Indicator in
Europe - 2nd ten-day period of September
2015**



DMCSEE
Drought Management Centre
for Southeastern Europe



SPI Aug 2015 (3 months)
GPCC first-guess analysis



■ ekstremna suša
■ zmerna suša
■ blaga suša

www.dmcsee.org

Bosna in Hercegovina
Drought damages RS agriculture for more than 156 million KM
BOSNIA TODAY | AUGUST 6, 2015

Hrvatska
Posljedice suše
Povrtlarima i ratarima propala godina!
Datum: 02.09.2015, 20:00 | 2
Kategorija: Poljoprivredne vijesti

Romunija
Romania: 20% lower fruit and veg production due to drought
The lower fruit and vegetable production in Romania is already taking a toll on food prices; this year, prices for some vegetables are expected to see increases of up to 30%, according to the producers.

Madžarska
Drought shrivels Hungarian Apple Harvest
The vegetable sector has registered losses in production of up to 30% compared to last year; some of the most affected crops are cucumbers," stated Aurel Tanase, Executive Director of the National Organization for Fruit and Vegetable Production.
Published on Aug 19 2015 12:55 PM in Fresh Produce tagged: Hungary / Drought / Agriculture

Srbija
SUŠA OPUSTOŠILA NJIVE
21.08.2015 | Aktuelno fokus Klimatske promene | Poljoprivreda | Srbija | Terme
Životna sredina | 0 comments | 126 views

Moldavija
Drought hits animal feed in Moldova
By Vladislav Vorotnikov | 07-Aug-2015
Last updated on 07-Aug-2015 at 11:39 GMT
Corn is one of the feed crops that has been badly hit

Related tags: Alexandr Silusar, Ion Sula, Moldova, UniAgroProtect, Animal feed
Severe drought in Moldova already led to the acute shortage of feed grain, and the situation may significantly worsen within the coming months, the country's officials and market participants indicate.
The report of the organization of agricultural producers of Moldova, UniAgroProtect, stated that the yield of feed grains would be nearly 50% lower compared to last year.

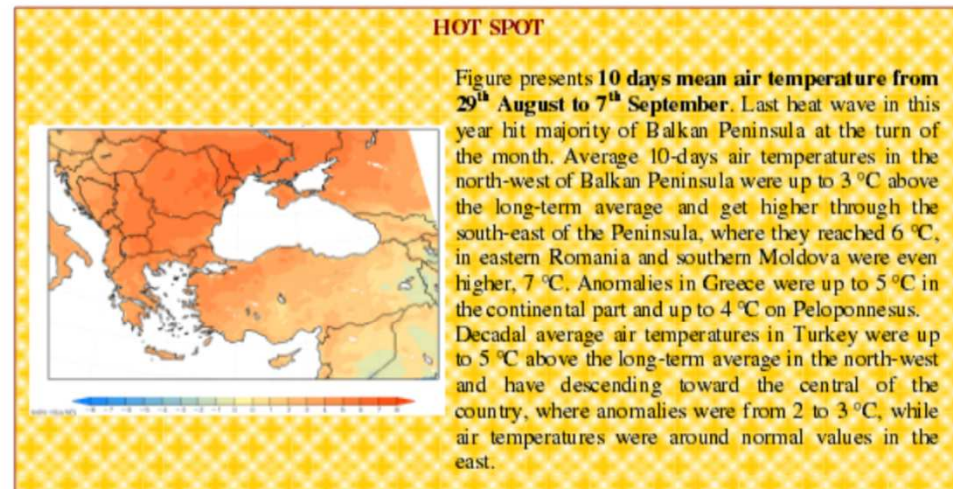
Drought Bulletin for SE Europe

- **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 impacts (more about agricultural drought impacts is missing!)**
- **Outlook**



DROUGHT MONITORING BULLETIN

10th September 2015

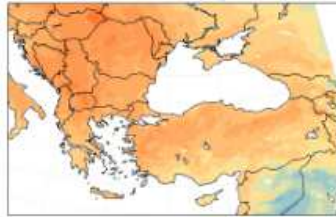


AIR TEMPERATURES AND SURFACE WATER BALANCE

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 10th July to 7th September 2015.

Warm August and very warm beginning of September in major part of Balkan Peninsula reflected in high above long-term average air temperatures of 60-days time period which were classified in the warmest 5 % of the years in the record in majority of Peninsula (left figure on the next page), where air temperature anomalies were up to 2.5 °C, in some isolated areas in Hungary, Romania, Serbia, Albania and Montenegro even greater (right figure on the next page). Meanwhile air temperatures in other areas of the DMCSEE region were classified in the warmest 30 % of the years in record. In those areas air temperature anomalies were mainly up to 2 °C, only in the smaller north-western part of Peninsula and in continental Greece up to 1.5 °C and on Peloponnesus up to 1 °C. The largest anomalies in Turkey were detected in the north and west of the country and were descending toward the south, where average air temperatures of 60-days period were around normal values.

AVERAGE AIR TEMPERATURE ANOMALY (°C)
10th JULY – 7th SEPTEMBER 2015



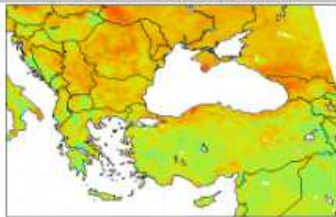
AVERAGE AIR TEMPERATURE PERCENTILE CLASSES
10th JULY – 7th SEPTEMBER 2015



Dry conditions due to the water balance in 60-days period from 10th July to 7th September persisted in the central and eastern part of the Balkan Peninsula in Moldova, Romania, Bulgaria, Serbia and in some parts of Hungary, Croatia, Bosnia and Herzegovina and in some scattered spots among wetter parts of remaining Peninsula (right figure below). Water balance anomalies were estimated in dry areas mainly up to 90 mm below the long-term average, at the most dry parts up to 180 mm in Romania, 150 mm in Serbia and 120 mm in Moldova (left figure below).

Major part of Turkey was determined as very wet in time period under consideration, only in the central of eastern part conditions remained dry. Sea coast second decade of August showed drier side in September. Another smaller dry area was in the north, along the Black Sea coast. Water balance anomalies were in the driest values, in smaller parts even higher.

ACCUMULATED WATER BALANCE ANOMALY (mm)
10th JULY – 7th SEPTEMBER 2015



OUTLOOK

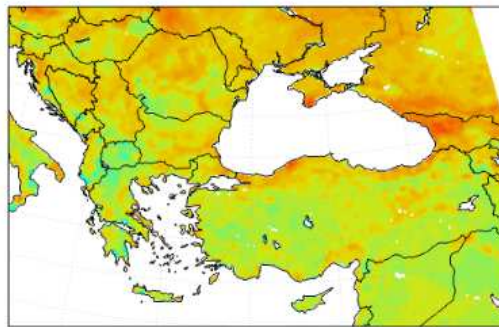
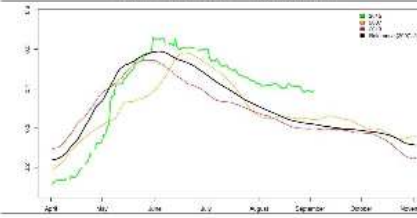


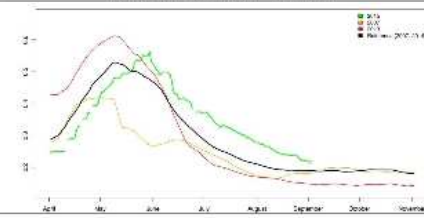
Figure presents the model simulations of the 60-days water balance anomaly (mm) for the time period from 20th July to 17th September. Conditions at Balkan Peninsula is expected to become less dry and will approaching to the normal values in the north and central part, while in the south, wet areas will be even wetter. Major part of Turkey will persist in very wet class according to the long-term statistics. Dry conditions in the north along the Black Sea coast will mainly persist in current dry conditions.

FYRO MACEDONIA

Tikveš Region – Kavadarci



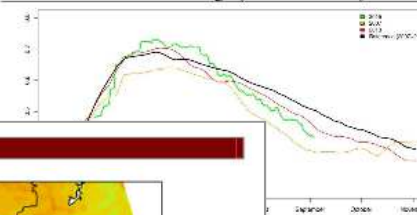
Ovče Pole Region – Lozovo



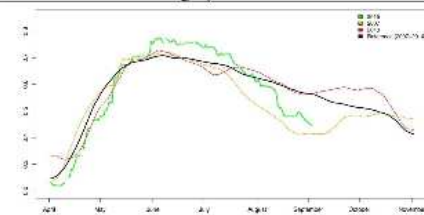
FVC values in central – Ovče Pole Region, and in the south – Tikveš Region, persisted above the 8-year average. State of vegetation cover in August slightly worsened in accordance with the reference values at the end of the vegetation season.

REPUBLIC OF SERBIA

Smederevsko vinogorje – Malo Orašje

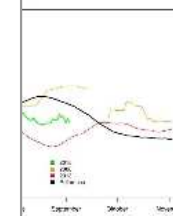


Vršacko vinogorje – Veliko Središte



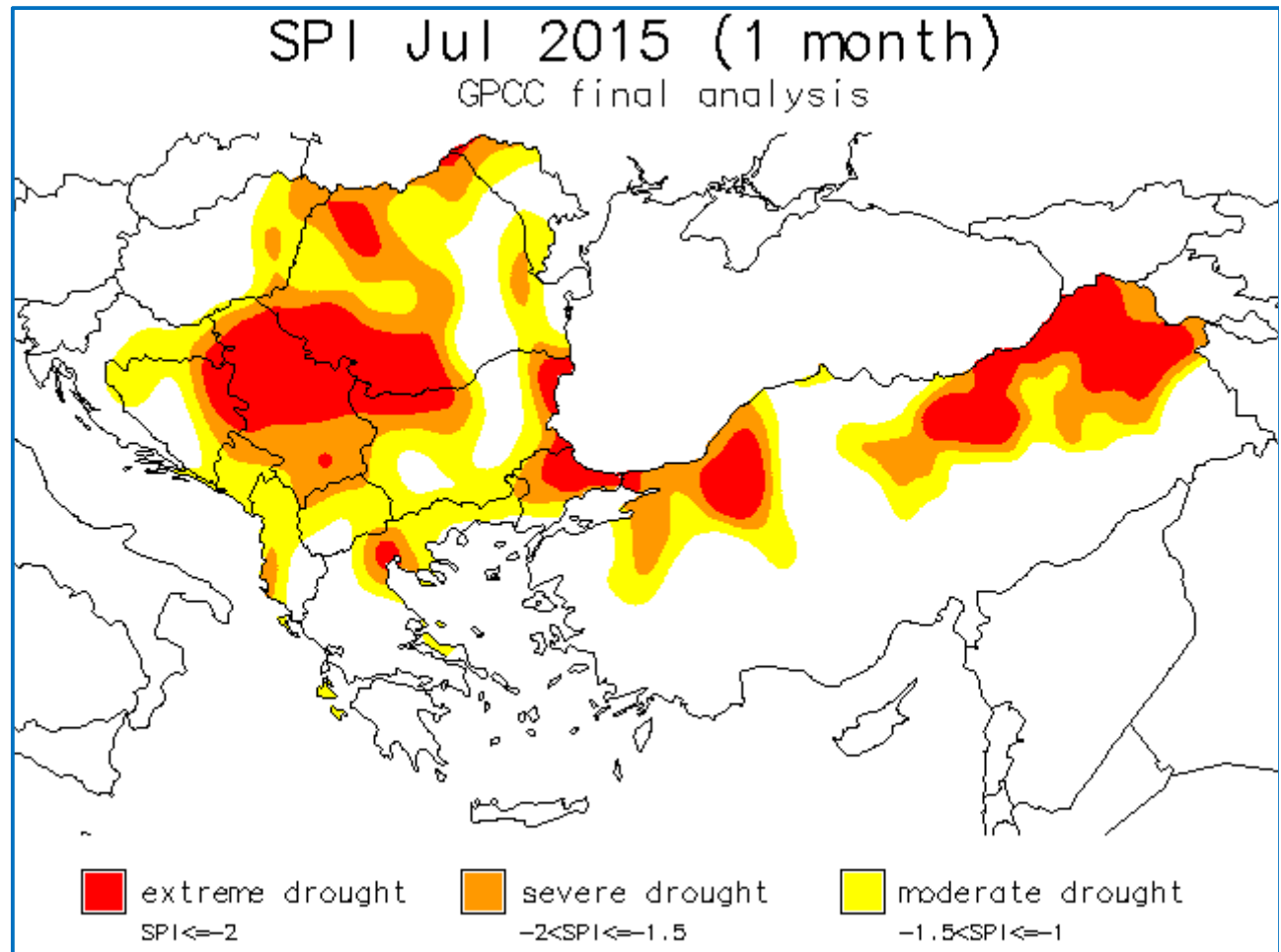
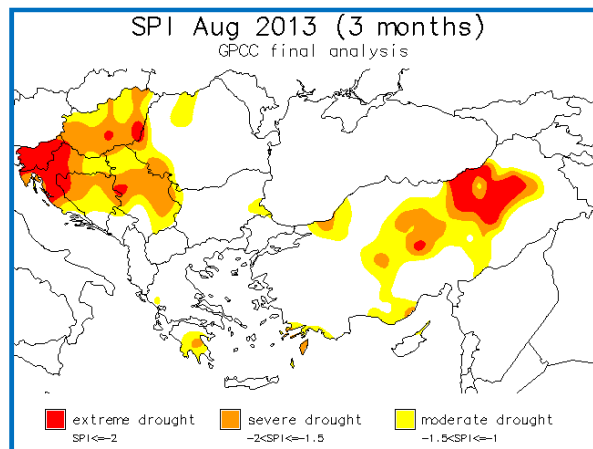
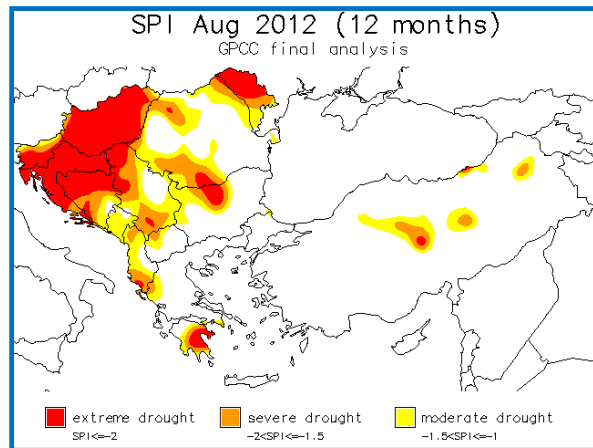
the vegetation season at the end of June until September is much faster than the reference values. Particularly noticeable is the decline in Vršacko vinogorje in August, approximately 15 %.

SVENSKA REPUBLIKA SLOVENIJA – Prekmurje Region – Murska Sobota



FVC line was below the reference values in the north-eastern Slovenia due to the high above long-term average air temperatures. FVC persisted around the same value for almost the whole August.

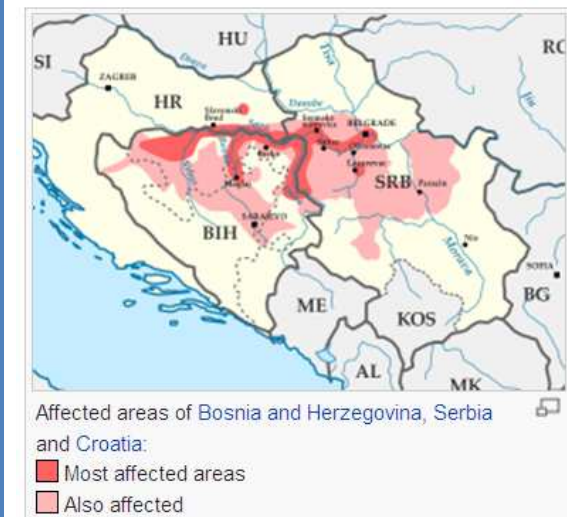
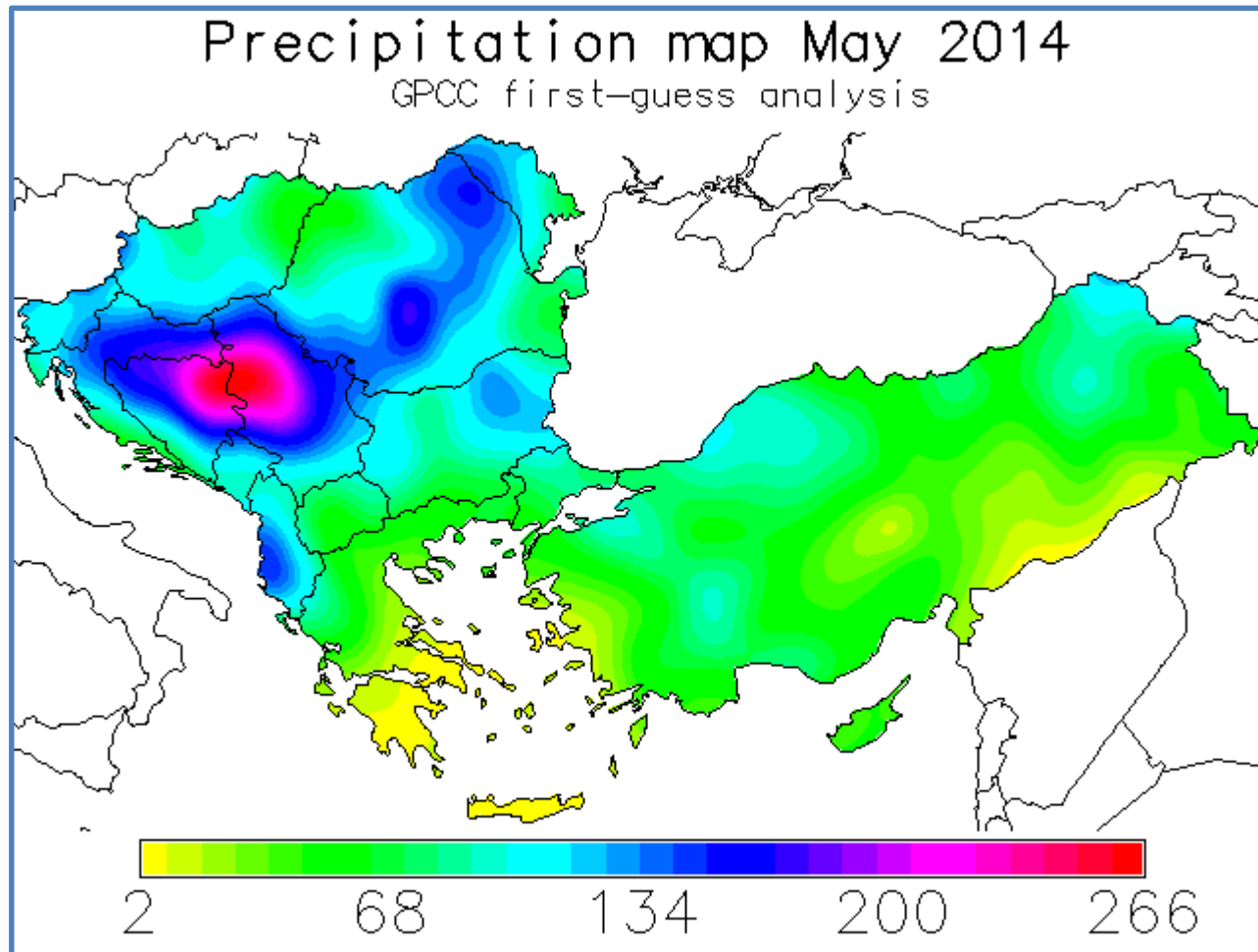
Drought monitor – meteorological drought



From one weather extreme to another



Drought monitor – meteorological drought/wetness



SE Europe flooding,
May 2014

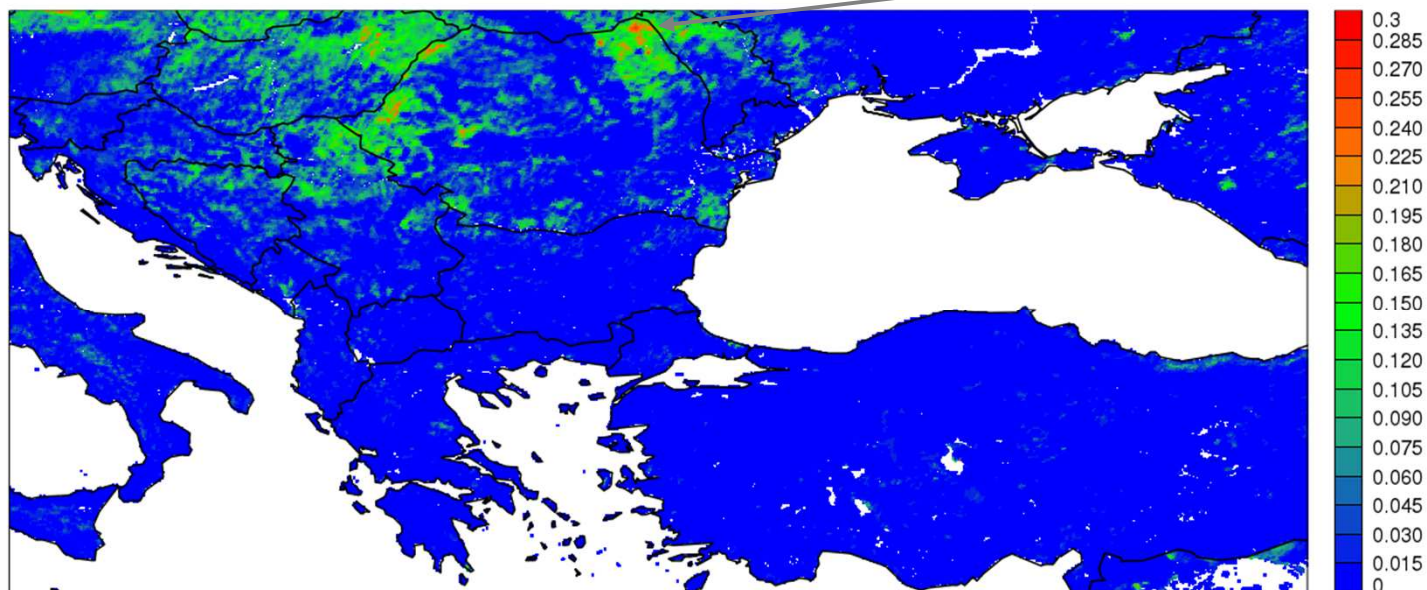
Drought monitoring application of remote sensing data

Accumulation of FVC anomaly – example of **drought 2015**

AUGUST 2015

UMETSAT

Monthly FVC Accumulations (20150802 - 20150831)



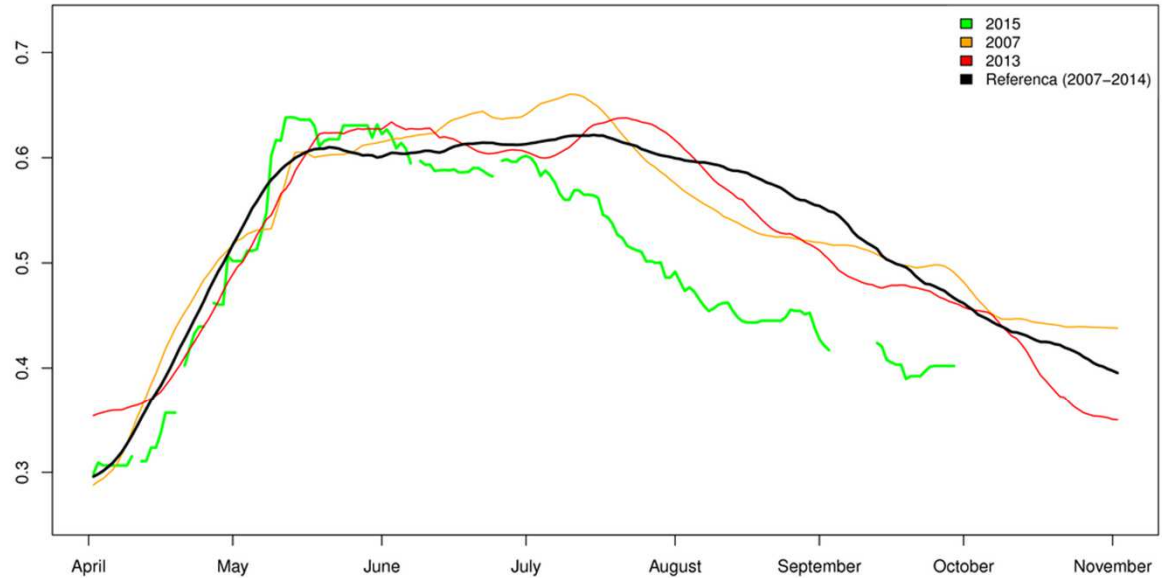
Up to 30 %
deviation of
vegetation
cover

- difference to last 8 year
average) computed from
available archive of
EUMETSAT's
LandSAF anomaly
showed the Fraction of
vegetation cover
anomaly

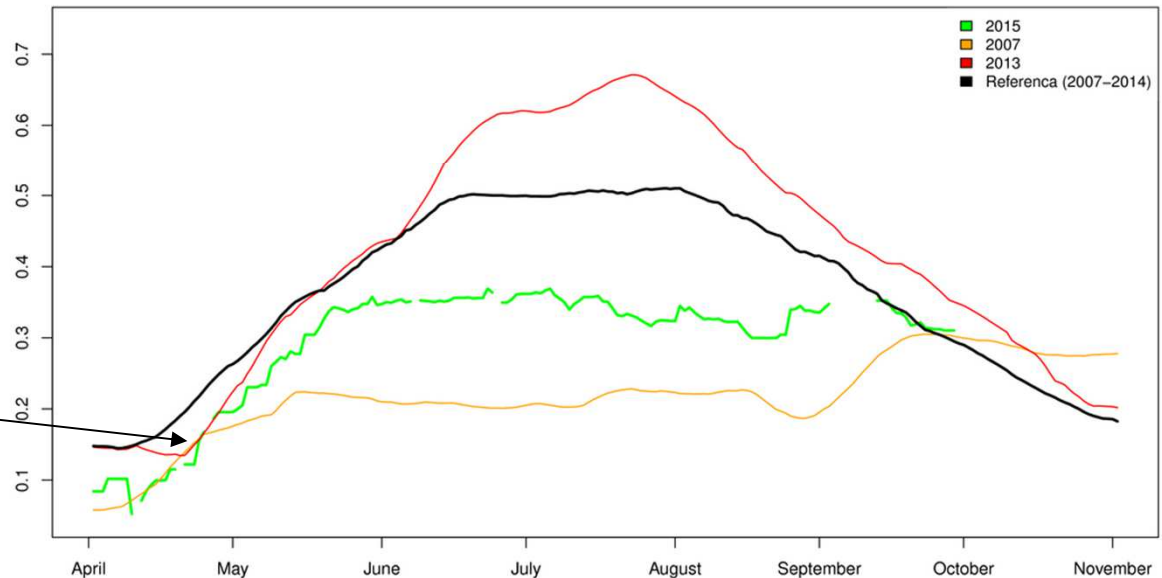
- mapping on DMCSEE domain

Drought in NE and W
Romania, N Moldova, N
Serbia, N BiH, Hungary

Bosnia and Herzegovina, Laktaši



Romania, Bucovina



2013
2007



DMCSEE
*Drought Management Centre
for Southeastern Europe*

Recent developments – Application of remote sensing data in SE EUROPE - EUMETSAT LSA SAF products

Trainings, workshops

EUMETSAT LSA SAF products



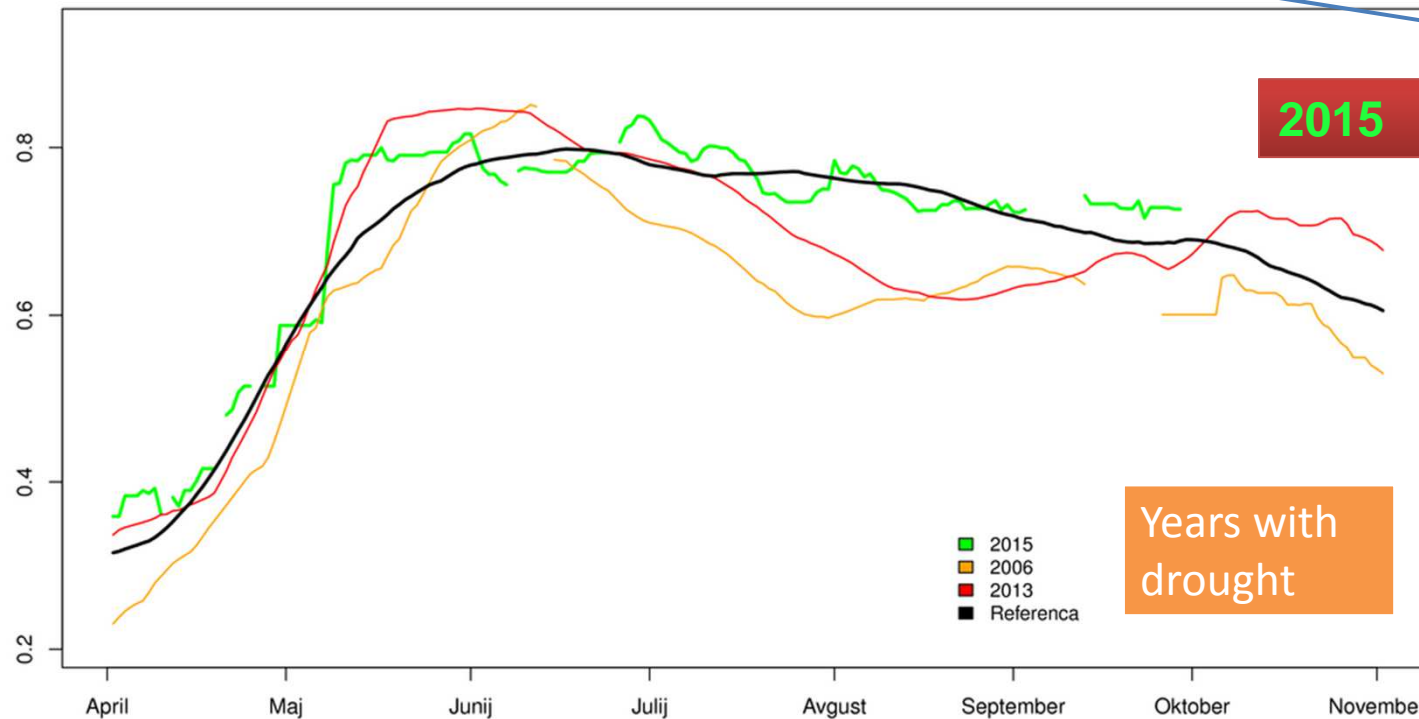
Training workshop on application of RS - EUMETSAT LSA SAF products (Brdo, Slovenia, November 2013)

- ✓ organized in the frame of the IPA/2012/290552 Project: “Building resilience to disasters in Western Balkans and Turkey” with WMO support

✓ reference always needed for drought detection!

© ARSO/EUMETSAT

Indeks FVC: Nova Gorica (20150927)



Years with drought

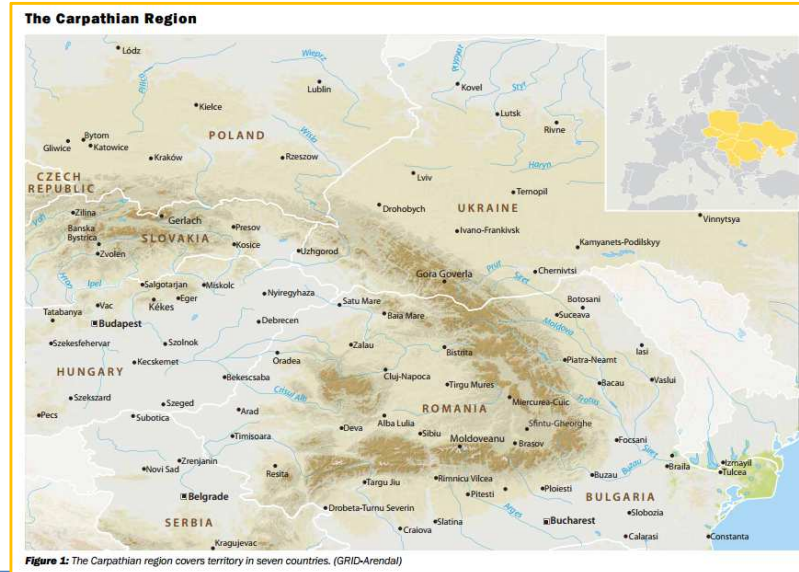
Widden the pool



Regional cooperation;

Research coordination across disciplines and national boundaries;

Strengthen and foster knowledge exchange on climate change and adaptation.



Project cooperation

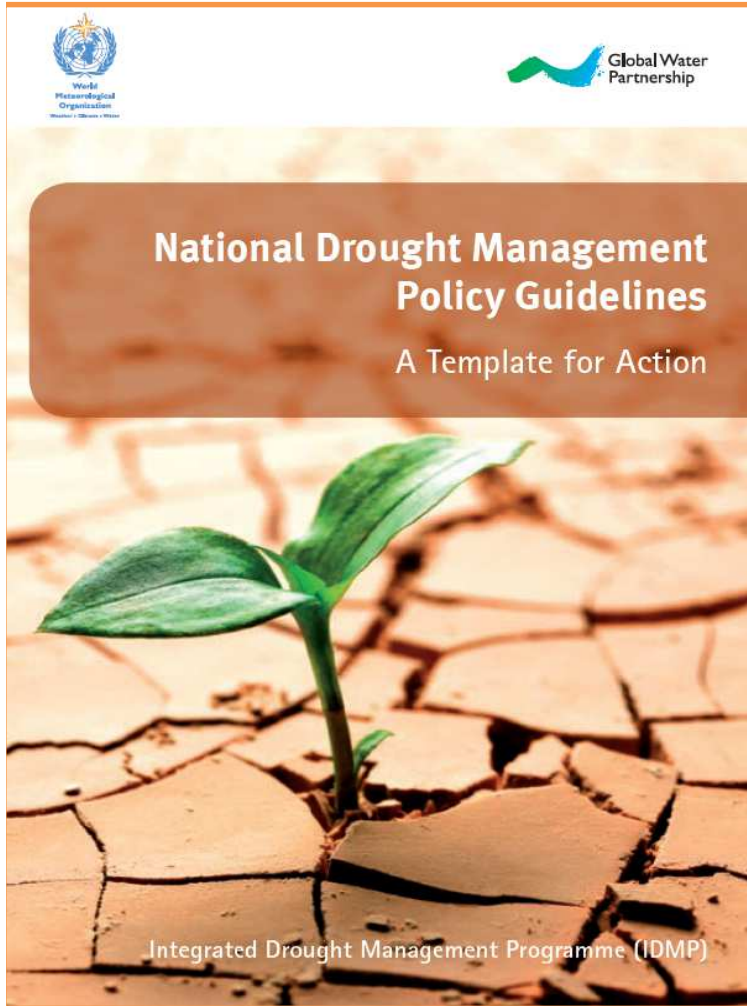
WMO/GWP Integrated Drought Management Programme in CEE (IDMP) – platform & good practice compendium, 2013 - 2015

Integrated Drought Management Programme in Central and Eastern Europe



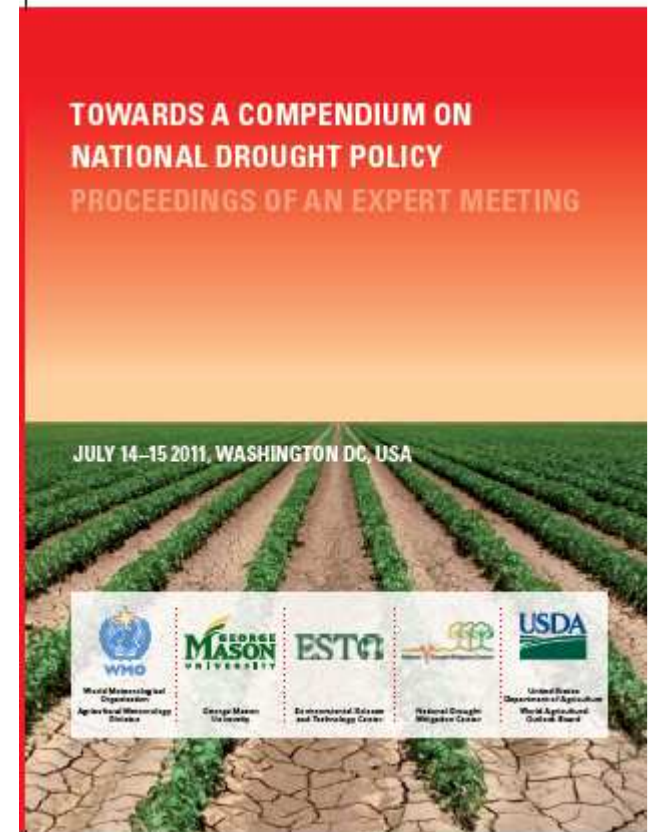
- **Integration of national data into DMCSEE portal**
- Better quality of products and composites, calculated automatically
- **Importance of national focal points and data providers**





The 10 steps in the drought policy and preparedness process are:

- Step 1:** Appoint a national drought management policy commission
- Step 2:** State or define the goals and objectives of a risk-based national drought management policy
- Step 3:** Seek stakeholder participation; define and resolve conflicts between key water use sectors, considering also transboundary implications
- Step 4:** Inventory data and financial resources available and identify groups at risk
- Step 5:** Prepare/write the key tenets of the national drought management policy and preparedness plans, including the following elements: monitoring, early warning and prediction; risk and impact assessment; and mitigation and response
- Step 6:** Identify research needs and fill institutional gaps
- Step 7:** Integrate science and policy aspects of drought management
- Step 8:** Publicize the national drought management policy and preparedness plans and build public awareness and consensus
- Step 9:** Develop education programmes for all age and stakeholder groups
- Step 10:** Evaluate and revise national drought management policy and supporting preparedness plans



Instructions for better drought management and drought policy

- integrated management of water resources and river basins – drought?

DMCSEE cooperation options

Early drought warning in SEE (platforms)

- active countries participation in existing platforms (global, regional – EDO, DMCSEE, Carpathian Convention platform?), exchange information inside/outside the countries).

Drought management as a part of national legislation (national commitments)

- Europe/WFD, UNCCD/NAP/RAP, regional strategies.

Networks

- ISC DMCSEE and consortium partners.



Common projects

- GWP/IDMP, Carpathian Convention?
- project calls (in preparation process application for Danube programme).



Public awareness /capacity building

- drought news/impacts information sharing;
- guidelines, manuals, trainings;
- public participation.

