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

DMCSEE
Drought Management Centre for Southeastern Europe

DROUGHT MANAGEMENT CENTRE FOR SEE – support to agrometeorologists

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Workshop „Agrometeorologist in hotter, drier and wetter future“,
Ljubljana, November, 09-11, 2016

- Facts about ARSO
- DMCSEE - Drought management center for SEE Europe
- 10th anniversary of operational work
- Recent project work – DriDanube project
- DMCSEE cooperation options

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ARSO ID

- **Body of the Ministry of Environment and Spatial Planning**
  - 100 % governmental institution.
  - 303 Employees
  - Performs tasks of National Meteorological and Hydrological Services (NMS) according to the guidelines of the WMO

- **Working areas:**
  - meteorology;
  - hydrology;
  - environmental monitoring and assessment
    - air quality, water quality, soil properties;
  - seismology and geology;
  - environmental protection;
  - preservation of natural resources and biodiversity.

http://www.arso.gov.si/

meteo.si

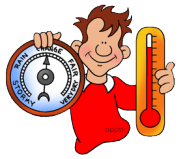
Meteorological Office

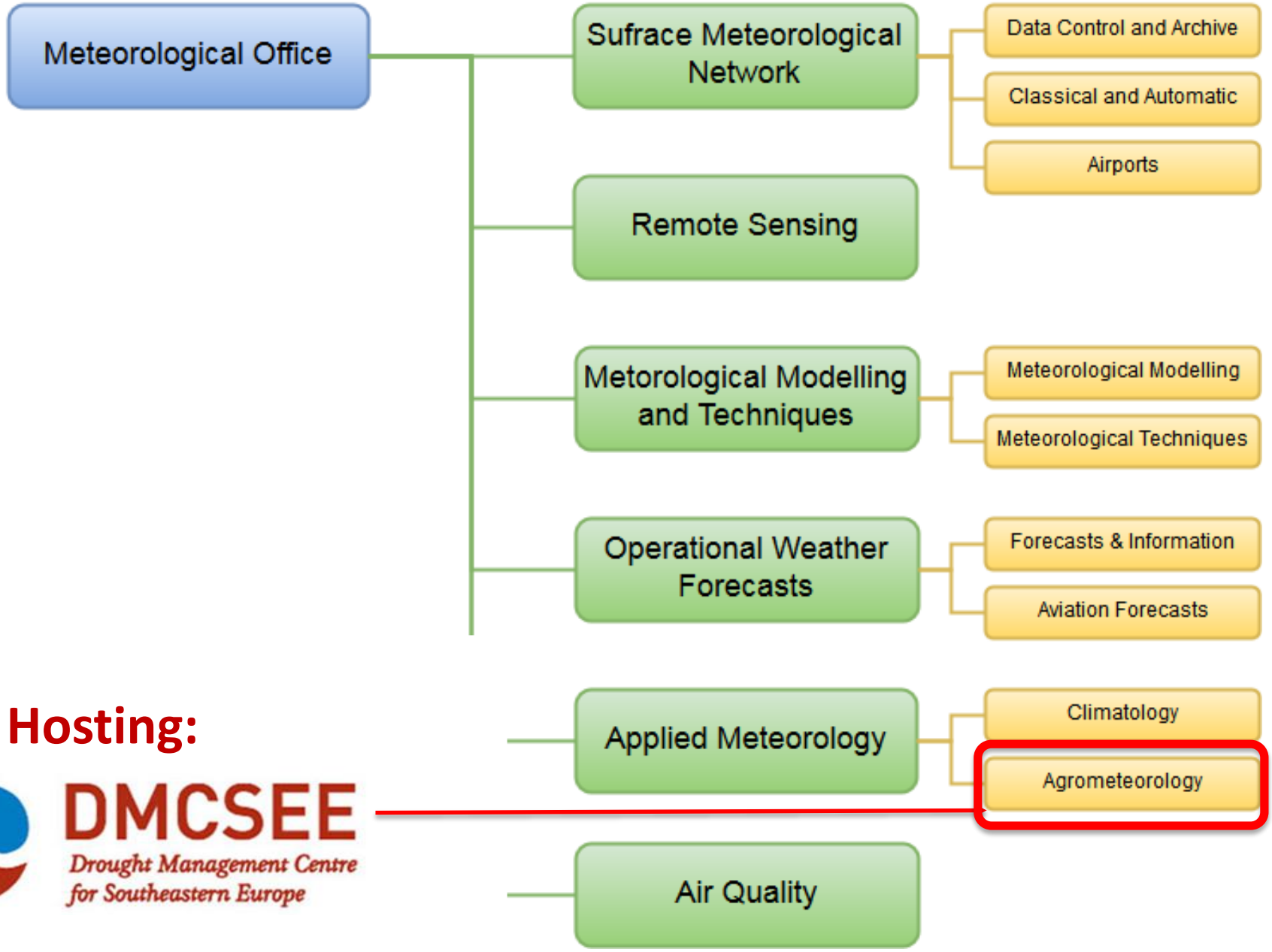



Principle tasks:

- Monitoring, analyzing and forecasting of weather in Slovenia and its vicinity
  - Issuing warnings on extreme / dangerous weather and weather related phenomena
- Monitoring, analyzing and forecasting of air quality in Slovenia
  - Issuing warnings on exceedance of PM10 limit value and O_3 information or alert values
- Analyzing climate variability and predicting climate change
- Maintaining of national meteorological infrastructure (network, models, etc.)
- Maintaining of national meteorological databases and archive
- Special services for **agriculture** & other sectors





Hosting:

DMCSEE
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need for Balkan subregional center

1998

Center initiative – **"top-down" approach**
International Commission on Irrigation and Drainage (ICID) adopted a declaration which expressed the need to establish this centre to alleviate problems caused by drought in the area "Balkan Drought Workshop" in Poiana/Brasov (RO), co-sponsored by the UNCCD

2004

triangle approach: UNCCD focal points, permanent representatives with the WMO + observers from UNCCD and WMO)
Workshop for national experts and representatives of National Meteorological and Hydrological Services where they agreed on DMCSEE within context of UNCCD

2006

decision on DMCSEE host institution (procedure led by WMO)

advocacy, management, steering committee, active institutions in consortium

2007

political commitment of Slovenian government (permanent budget for the governance)

first drought monitoring products, fund raising

2009

Transnational cooperation programme (TCP), cooperation with Eurogeoss project and European Drought Observatory portal

2013

GWP project

G-WADI

2014

2015

ad hoc group - project preparation

Approved for co-financing on October 6, 2016

Application of DRiDanube project (Danube TP)

2016

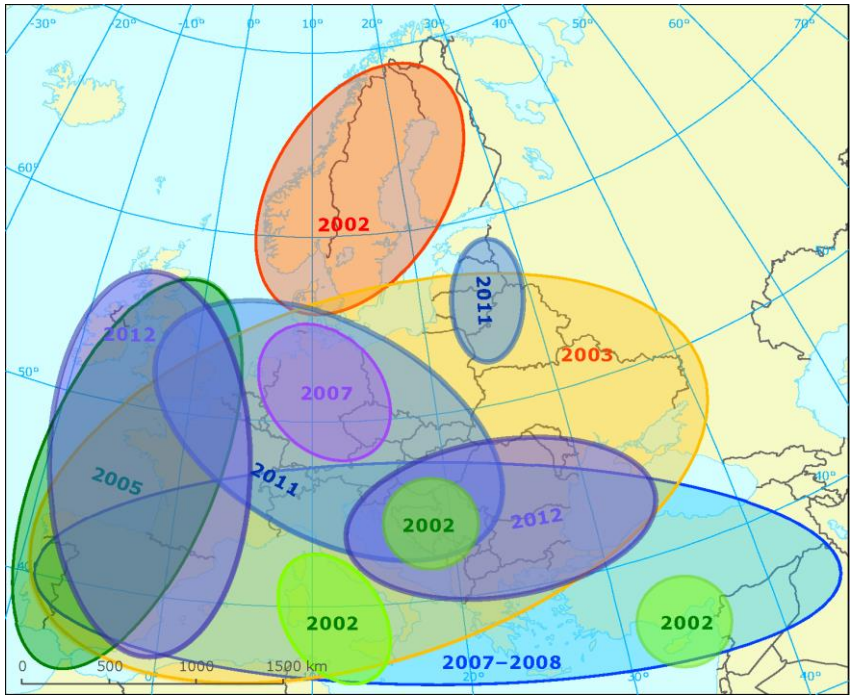
DMCSEE
10th anniversary
2006-2016

14 countries

www.dmcsee.org

Drought issues on European level

European droughts 2002 – 2012



(EEA, 2012)

Water scarcity and droughts in Europe

EUROPEAN DROUGHT OBSERVATORY (EDO)

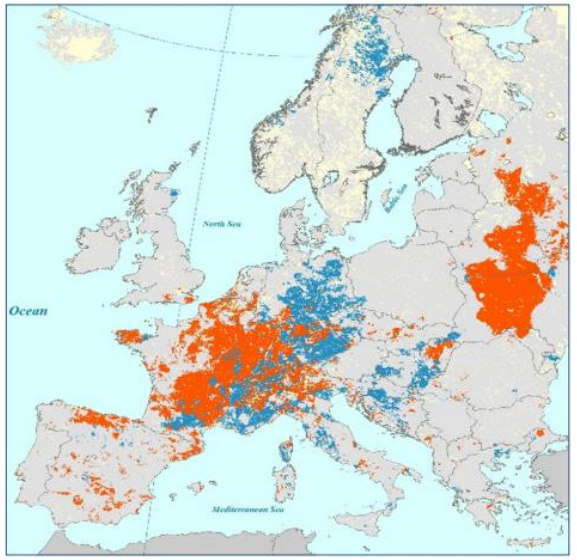


Figure 7: Areas with the lowest soil moisture content since 1990 in July 2015 (in red) and in July 2003 (in blue). Source: JRC-EDEA database (EDO)

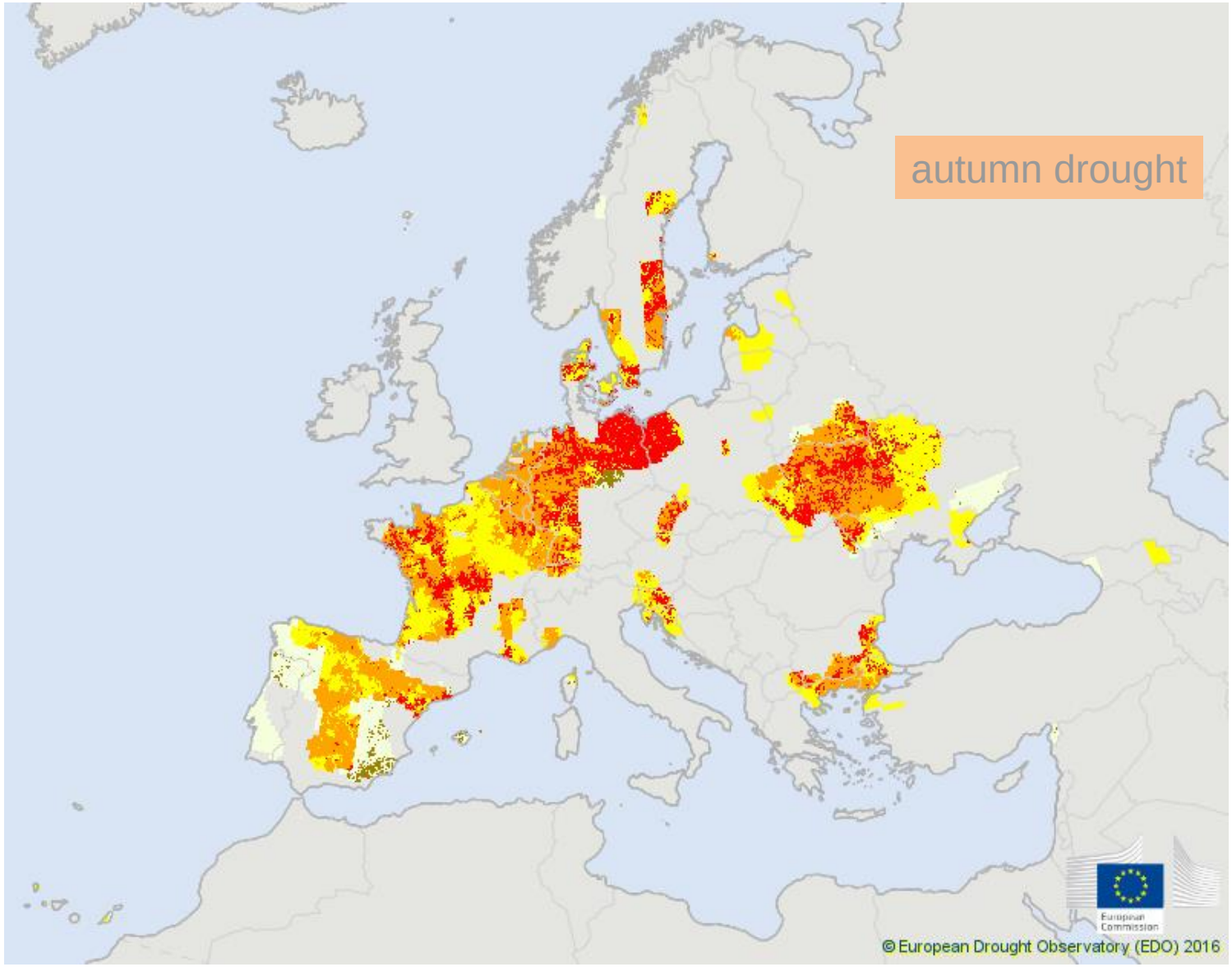
Drought 2015

http://edo.jrc.ec.europa.eu/

Why DMCSEE and our products?

- SE Europe **regional overview** of information on drought,
- **Tools (models)** for visualization and analysis of drought event,
- Set of information resources organized for the collection, processing, maintenance, transmission, and dissemination of information in accordance with defined procedures to meet specific regional/national needs;
- **Access** to regional and national drought information;
- **New approaches**: development in RS in comparison to conventional measurements available in global/regional exchange triggered common approaches;
- but **country drought products** prepared from local measurements are crucial for drought status assessment.
- DMCSEE support to **stakeholders** (secondment of staff, workshops)
  - EDO is developed by of Joint Research Centre (JRC)/a department of the European Commission providing independent scientific and technological support for EU policy-making: **http://edo.jrc.ec.europa.eu/edov2/**
  - **DMCCSE supports SEE region**

Situation of Combined Drought Indicator in Europe - 2nd ten-day period of October 2016



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

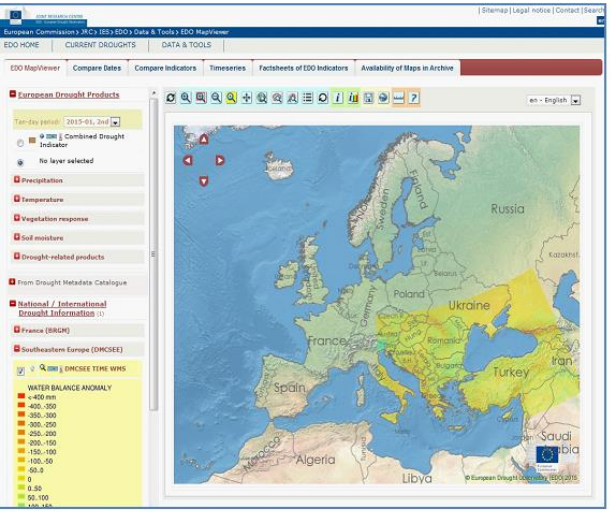
Remote sensing: LSA-SAF

Long term forecast

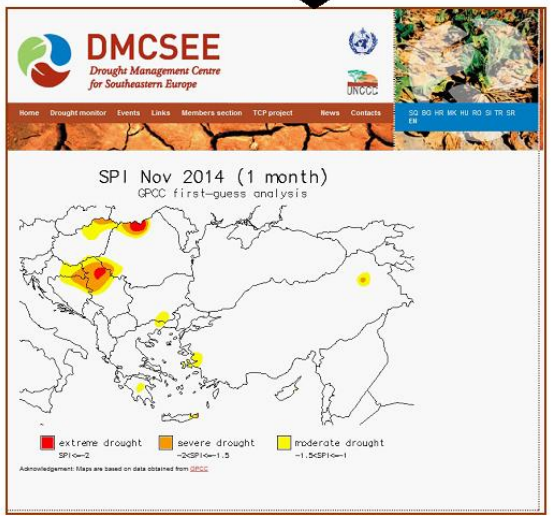
Not operational
Cooperation with VCCC (Serbia)

Coming in near future

International exchange (EDO)

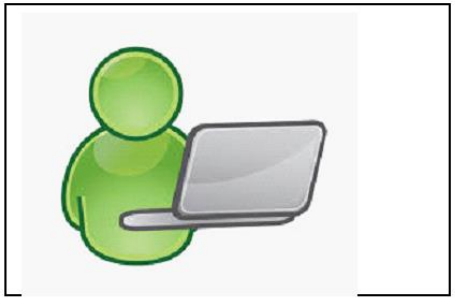


Database Map server



Historical reconstruction

Station and raster archive
Impact archive



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 avaialable 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>>>

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Drought Management Centre for Southeastern Europe

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

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

SOUTH EAST EUROPE
Jointly for our common future

DMCSEE
Drought Management Centre for Southeastern Europe

Programme co-funded by the EUROPEAN UNION

DROUGHT MONITORING BULLETIN

4th November 2016

HOT SPOT

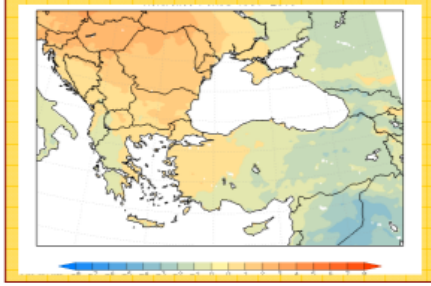
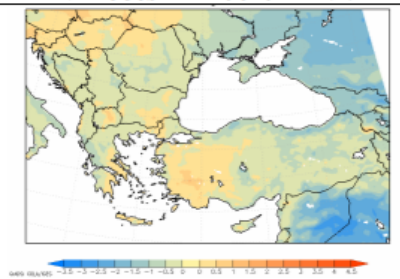


Figure shows mean monthly air temperature anomalies recorded in September (reference period 1981–2010). Major part of Balkan Peninsula experienced above average air temperatures for at least 1 °C, with the exception of Greece and Albania. Anomalies in central and eastern Peninsula were up to 2 °C and 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.

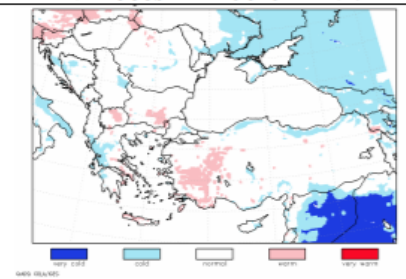
AIR TEMPERATURES AND SURFACE WATER BALANCE

*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.

Drought monitoring application of remote sensing data

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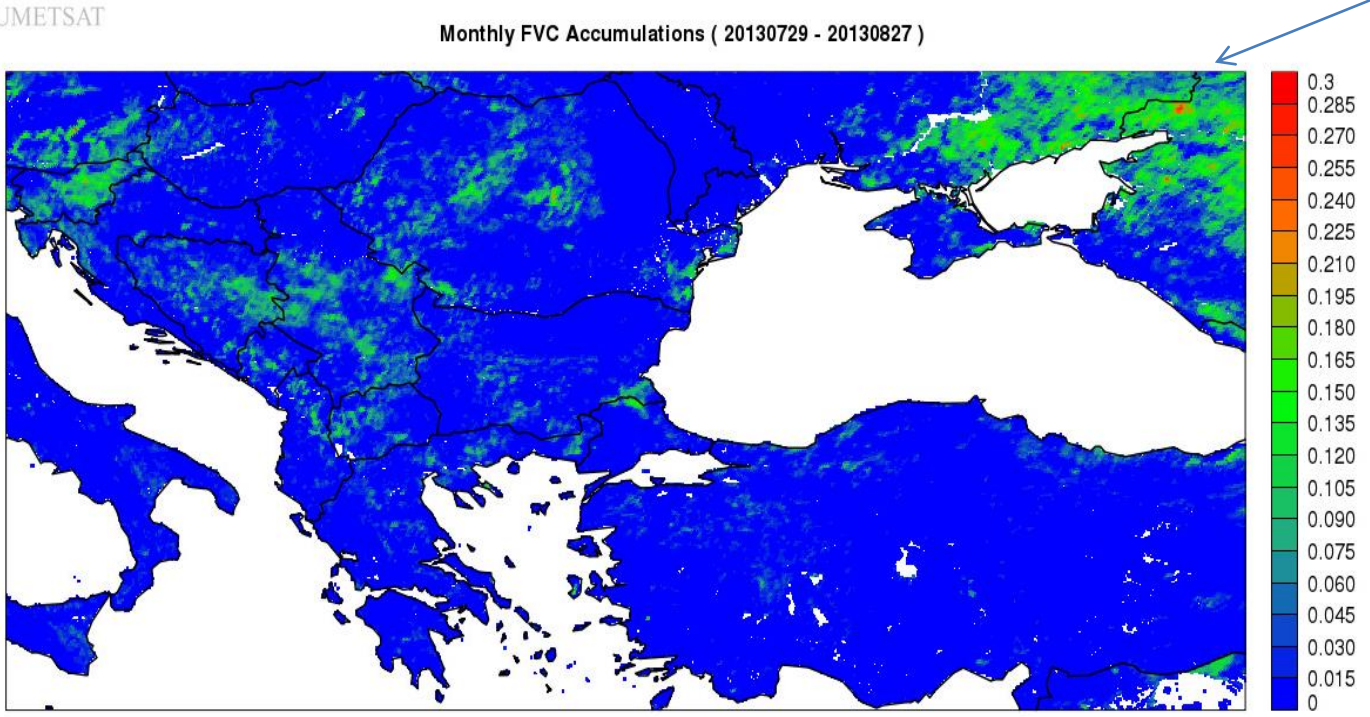
Accumulation of FVC anomaly – example of drought 2013

Summer 2013



Up to 30 % deviation of vegetion cover

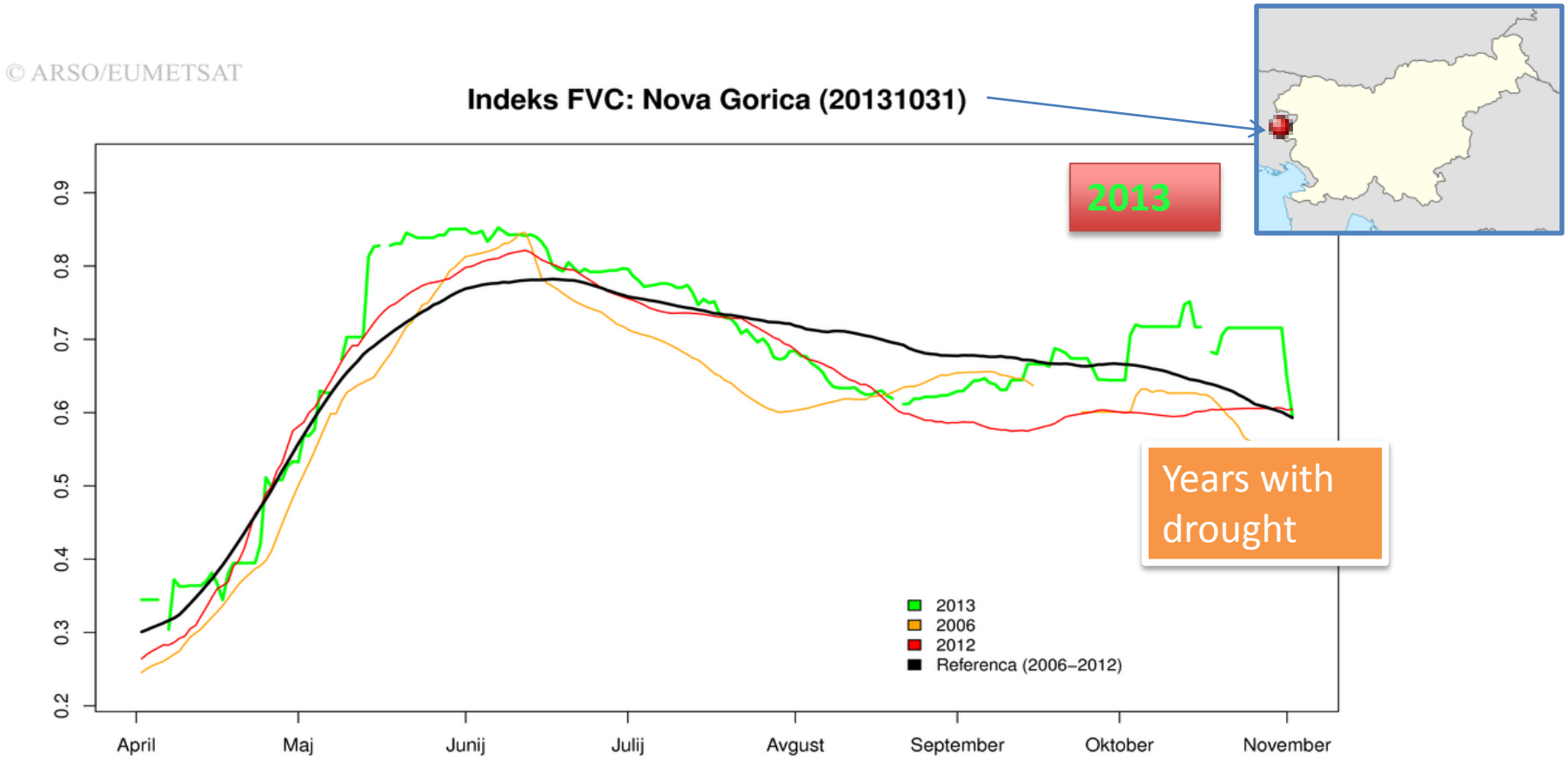
- difference to last 5 year average) computed from available archive of EUMETSAT's LandSAF anomaly showed the Fraction of vegetation cover anomaly (difference to 5 year average) – eastern Slovenia.

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

Application of remote sensing data –

EUMETSAT LSA SAF products

- reference always needed for drought detection!



Project work.

Project partners.

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SOUTH EAST EUROPE
Transnational Cooperation Programme

http://www.dmcsee.org/en/tcp_project/

DMCSEE TCP project in the frame of Transnational Cooperation Programme of SE Europe (TCP)

Duration: 2009-2012

The objective of the DMCSEE TCP project was 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.

Project work.
Building resilience to disasters in Western Balkans and Turkey

Building Resilience to Disasters in Western Balkans and Turkey

http://www.preventionweb.net/ipadrr

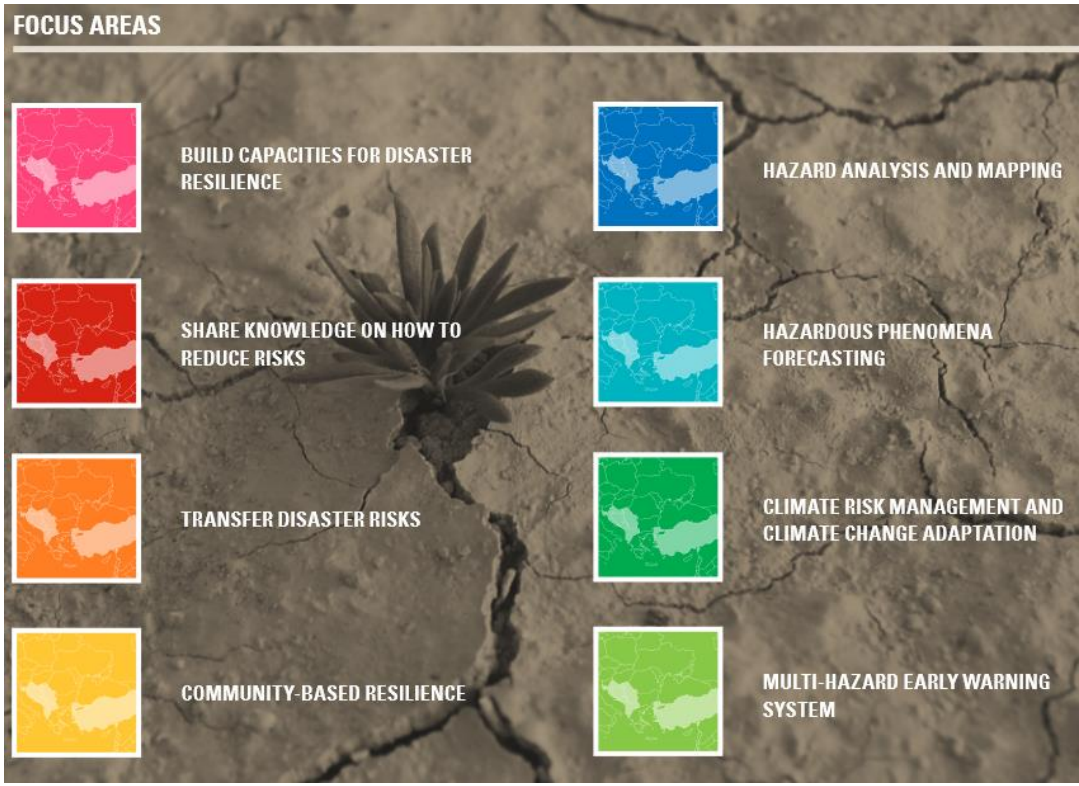
Beneficiary countries:

Albania, Bosnia and Herzegovina,

Croatia, Montenegro, Serbia,

FYROM, Turkey,

Kosovo (defined in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo Declaration of Independence)



Building resilience to disasters in Western Balkans and Turkey

Building Resilience to Disasters in Western Balkans and Turkey

http://www.preventionweb.net/ipadrr

Duration: 2012 – 2014

DMCSEE tasks:

- Secondment of experts from four beneficiaries to the DMCSEE for Training
- Organization of training workshop – application of remote sensing data in the countries/agricultural areas (some published in the bulletin)
- 3 in FYROM, 1 in MNE, 2 in SRB and 3 in BiH-RS
- FVC and LAI indices compared to meteorological records (SPI, ET, …)

IDMP
Integrated Drought Management Programme

World Meteorological Organization
Weather • Climate • Water

WMO/GWP Integrated Drought Management Programme (IDMP) established in **2013** at the HMNDP IN Geneva.

Global Water Partnership
Central and Eastern Europe

- GWP CEE was the first region which started with implementation in March 2013;
- **FOCUS:** Increase the capacity of the CEE region to adapt to climatic variability by enhancing resilience to drought. From reactive to proactive drought management.

Activities:

- cooperation with national governments *(national consultation dialogues, Guidelines for preparation of a Drought Management Plans)*
- demonstration projects *(drought impacts in forest, agricultural drought monitoring with remote sensing data, small retention measures, etc.)*
- regional cooperation *(integration of CEE drought data into EDO, cooperation with ICPDR, EUSDR on drought issues)*

Follow-up project development (2014-2016)

2 follow up workshops
Budapest, October 2014
Bucharest, April 2015

4 major thematic areas:

- Drought monitoring
- Upgrading drought risk assessment /drought risk atlas for CEE/SEE
- Drought cost assessment
- Strengthen a culture of preparedness at a national level

Recent work in 2016

Project development: DriDanube - Drought Risk in the Danube Region

1st Call of the Danube Transnational Programme

- *1st Step* - 3 November 2015 – 576 EoIs submitted
- *2nd Step* - 9 May 2016 - 91 AFs submitted
- APPROVED – 27 September 2016
- Conditions clearing: September – October
- Expected start: January 2017

Interreg
EUROPEAN UNION
Danube Transnational Programme

- Priority Area 2: Environment and culture responsible Danube region
- Specific Objective 2.4 Improve preparedness for environmental risk management

Recent project application: Drought Risk in the Danube Region - DriDanube

Lead Partner: Slovenian Environment Agency

(Drought Management Centre for Southeastern Europe)

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Drought Management Centre for Southeastern Europe

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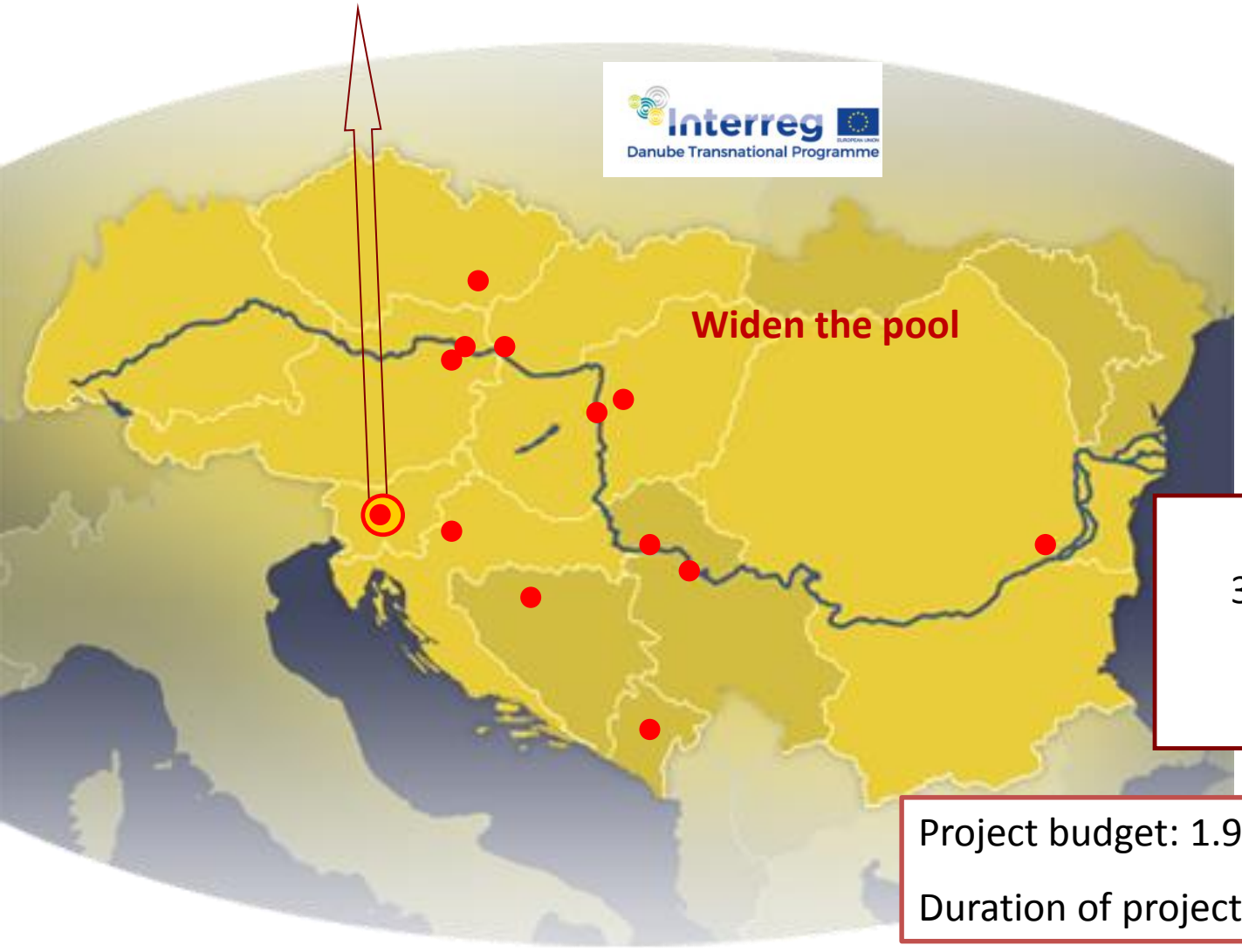
Interreg
Danube Transnational Programme



Slovenia 2
Austria 2
Czech Republic 1
Slovakia 2
Hungary 2
Romania 1
Croatia 1
Serbia 2
Montenegro 1
Bosnia and Herzegovina 1

7 EU countries

3 Non-EU countries

15 partners

9 ASP partners

Project budget: 1.974.750,00EUR

Duration of project: 30 months

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.**

Drought Risk in the Danube Region - DRiDanube

Interreg
Danube Transnational Programme

EXPECTED RESULTS

MAIN result:

Improved drought emergency response (Strategy) and better cooperation among operational services and decision making authorities in a Danube region on national and regional level.

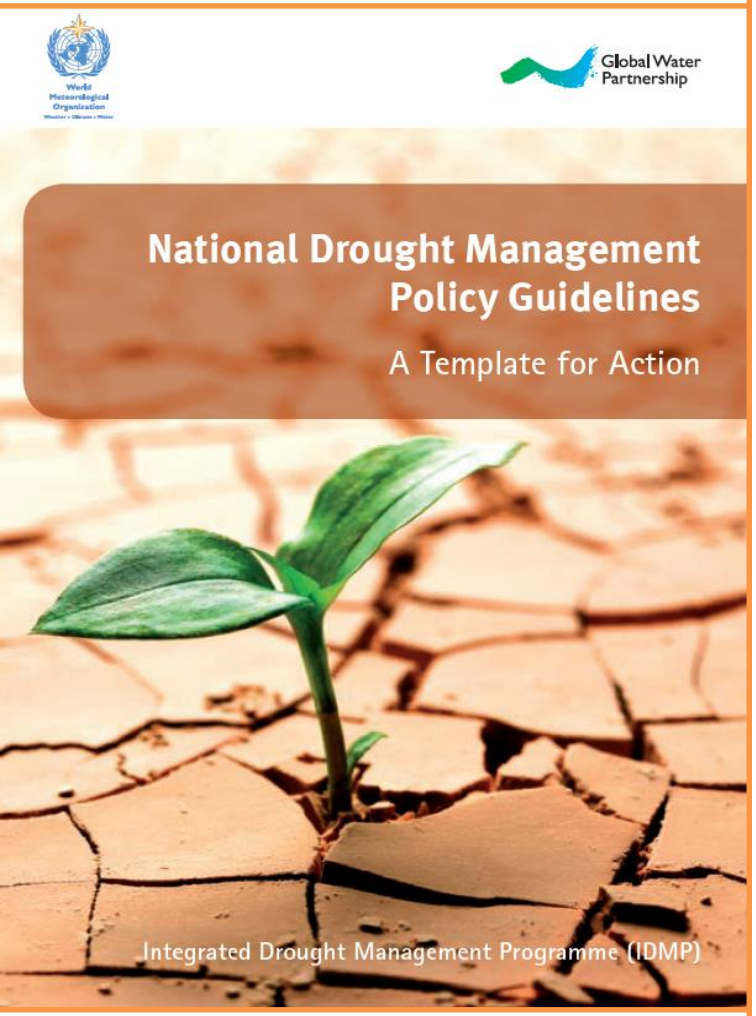
OTHER outcomes:

- Drought User service
- methodology for drought risk and for near real-time drought impact assessment including forecast
- pilot actions
- regional and national capacity building activities

TARGET GROUPS

Project will target primarily partners and stakeholders from Danube Basin.

- National Hydrometeorological Services
- Emergency response authorities
- Non-governmental organizations
- Water and Farmer communities/chambers
- Industries



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

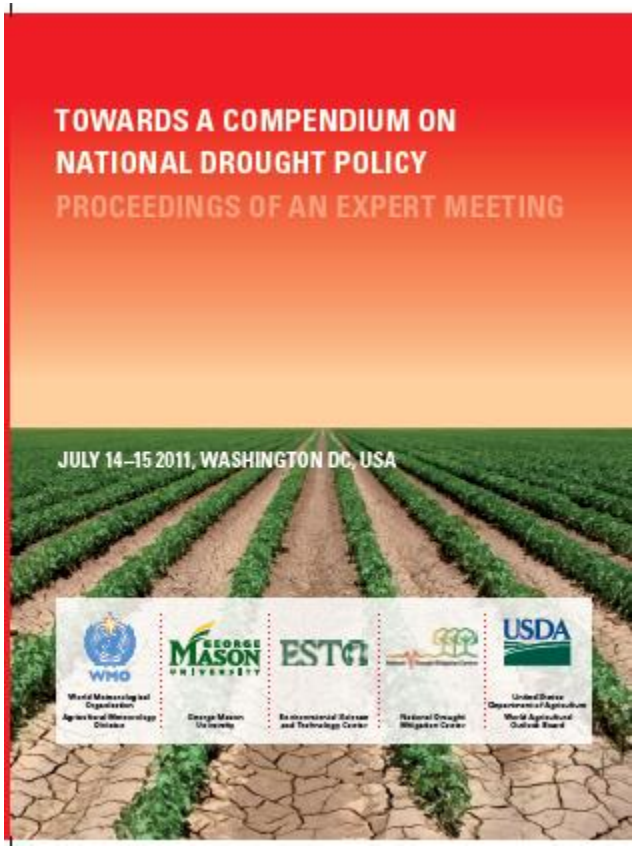
Step 6: **Identify** research needs and **fill** institutional gaps

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

DMCSEE cooperation options

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Early drought warning in SEE (platforms): focus on ag drought

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

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

- Europe/WFD, UNCCD/NAP, Civil mechanism, CCAdaptation strategies…

Networks

- ISC DMCSEE and consortium partners.

Food and Agriculture Organization of the United Nations

Common projects

- GWP/IDMP, WMO, Adaptation fund, FAO (study visits);
- secondment of staff (WMO support, Adaptation Fund);
- project calls (enlarge DriDanube or new initiatives?).

Global Water Partnership Central and Eastern Europe

World Meteorological Organization
Weather • Climate • Water

Public awareness /capacity building/liaision officers

- drought news/impacts information sharing, media;
- guidelines, manuals, trainings, publications (Tromp foundation).