DriDanube – Drought Risk in the Danube region

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“Drought: uses/practices and low-flow management”
20 November, Orléans, France
Why „drought“ projects?

Existing drought monitoring tools & initiatives

„Drought Project“ DriDanube

Global/regional cooperation
Motivation for „drought“ project in Danube countries

**WHY?**

**Current status**

**Monitoring**
- untimely delivery
- cross-border inconsistencies
- lack of integration of risk and impact data

**Impacts and risk assessment**
- no systematic collection of drought impacts
- lack and incomparable drought risk assessment methodologies
- despite the impacts on the economy and welfare of people, mainly in agriculture, drought is still not considered an issue of high priority

**Management**
- reactive, dealing mainly with losses and damages
- cooperation between key actors is missing
- formal legislation does not exist

www.interreg-danube.eu/dridanube
Drought - increasing problem on European level

European droughts 2002 – 2017

• In 1990s and 2000s, drought hotspots were Mediterranean area and Carpathian region;
• Large areas of EU have been affected by several major droughts in recent decades: significant European droughts occurred in 2003, 2011, 2015, 2017 and 2018. Many intense local droughts (2012, 2013).
• Severity and frequency of droughts have increased.
• Spatial and temporal variability is high.
• **Damage costs in 2003: 100 million people affected, 8.7 billion EUR.**

Source: (EEA, 2012; EEA, 2017; EDO, 2018)
Regional multi-sectoral drought impacts

In past decades, 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 and other water-related sectors.

Recent facts: Damage due to drought 2017

**Slovenia:** agriculture 65 mio EUR

**Czech Republic:** agriculture 120 mio EUR

**Bosnia and Herzegovina:** agriculture 126 mio EUR; 40 % losses in energy production (Bileća)

**Romania:** reduction of Danube flow for 60 % - higher electricity prices

**Serbia:** water shortage, dried-up lakes
DMCSEE hosted by ARSO

- 13 countries

- web-based platform: www.dmcsee.org

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**DMCSEE**

Drought Bulletin for SE Europe

Drought bulletin for SE Europe was formed in the scope of DMCSEE project in the framework of the Transnational Cooperation Programme. Please find more information (including Newsletters etc.) in section: **TCP project**.

Recently, we have started to publish Drought Bulletin for SE Europe. Bulletin contains following sections:

- **Hot spot**: short (100 to 200 words) summary, possibly including a figure. It aims at very 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 and temperature situation.
- **Report on impacts**: content of this section is based on information available in electronic media on the Internet. To improve the information, you are most welcome to participate by informing us of drought impacts in the current season in your region. Send your contribution and comments through our **contact**. Also any other comments on the bulletin content would be highly appreciated.

Please find published issues of bulletins in PDF format below.

**Related documents**

- Drought bulletin - 21st August 2018 (1.8MB)
- Drought bulletin - 12th July 2018 (1.8MB)
- Drought bulletin - 14th June 2018 (1.5MB)
- Drought bulletin - early spring 2018 (2.1MB)
Also rain rich countries are becoming drought-prone

Dry ice: Thousands of holidays in the Alps ruined after the region is declared a 'drought zone' and resorts are banned from making fake snow

- Fifty resorts in Haute-Savoie will have to turn off snow cannons on their pistes
- If there is no downfall by the weekend, the machines will be banned in the region
- It has stretched water supplies after some places haven’t seen snow in 50 days
- Across Europe, the warm weather and lack of snow is threatening ski seasons

Swiss army airlifts water to thirsty cows in drought-hit pastures

ROSSINIERS, Switzerland - Reuters - Swiss army helicopters began airlifting water on Tuesday to thousands of thirsty cows who are suffering in a drought and heatwave that has hit much of Europe.
Drought in 2018 – European Drought Observatory (EDO)
Combined Drought Indicator, 2nd decade of August 2018

- Established after 2011 & cooperation with DMCSEE
- leading disseminator on drought-relevant information and maps of indicators derived from a range of different data sources

Source: Joint Research Center, EDO – European Drought Observatory, URL, 2018
Drought Risk in Danube Region - DriDanube

- Project budget: 1.974.750,00€
- Project financed by European regional development fund (85%)
- Duration: 30 months (January 2017 – June 2019)
- Lead partner: ARSO/DMCSEE
**DriDanube - main objective and outputs**

**Improved drought emergency response** and better cooperation among operational services and decision-making authorities in the Danube region.

**Drought User Service**
An innovative tool integrating all available data, including large volume of remote sensing products and serving the authorities to monitor, forecast and respond during drought development faster and with higher precision.

**Methodologies for drought impact and risk assessment**
Unification and cross-border coherence of drought Risk and Impact assessments. Establishment of network of reporters as additional source of information for drought impacts in agriculture.

**DriDanube Strategy**
A clear guidance for overcoming the gaps in the drought decision-making processes and improvement of drought emergency response in the Danube region.

- **accurate and efficient drought monitoring and timely early warning**
- **better preparedness for the next drought**
- **quicker recovery**
- **unified impact and risk assessment**
- **improved and more efficient response before and during drought**
Result 1: Drought User Service – DUS

Web-based interactive tool for real-time drought monitoring through different drought indices.

Source of data: satellite (Big Data), meteorological data

Some integrated products/drought indices:

- **SWI anomalies** – relative soil moisture saturation (daily)
- **NDVI anomalies** – relative vegetation greenness (decadal)
- **SWB** – Surface Water Balance from numerical weather prediction model (decadal accumulation from April 1)
- **SWDSLO** – Soil Water Deficit based on water balance model mGROWA for the territory of Slovenia (daily)
- **SWDA** – no. of accumulated days with negative SWI anomaly
- **VegCon1** – Relative Vegetation Condition for crops and grasslands (weekly)
- **VegCon2** – Relative Vegetation Condition for all vegetation types (weekly)
... Drought User Service

Simultaneous view of SWI and NDVI on 01.09.2018
Result 2: Methodology for drought impacts assessment – interactions with reporters on weekly routine

Estimated drought impacts on vegetation for week 33 (between August 6-16)

1. ESTIMATED DROUGHT IMPACT ON MAIN CROP YIELD
   WEEK 33, 2018

2. WATER BALANCE FOR THE LAST THREE MONTHS

3. CURRENT SOIL MOISTURE IN THE TOPSOIL LAYER

Data provider:

Data processed by:

Issued: Aug 18, 2018
DriDanube Questionnaire for reporters - entry

http://questionnaire.intersucho.cz/en/

Simple methods to weekly check the state of soil & crops on a selected non-irrigated area using online questionnaire.

3 types of questionnaire (prevailing land use on observed area):
- agriculture,
- fruit growing, viticulture, olive growing,
- forestry.

Questionnaire has 12 single-choice questions:
- general info on soil moisture,
- subjective rate of damage on different crops,
- additional info on need of use of irrigation systems.

Engaging impact reporters:
- existing pheno observers,
- agri advisory services,
- drought-prone companies,
- interested individuals.
Result 3: DriDanube Drought Strategy

- **State-of-the-art** analysis country by country:
  - ways of determining drought,
  - legislation review (drought),
  - institutions involved in drought monitoring, management; communication and responsibility flow
  - process of drought evaluation and recovery,
  - research, education programmes or projects addressing drought.

⇒ common weaknesses & requirements for improvement

- Development of **optimal drought management model**:
  - Pillar I: drought policy framework,
  - Pillar II: institutional scheme of cooperation.

**MODEL:** drought management targets institutions defined in institutional scheme to collectively implement drought-related policies as detailed defined in drought management plan.
Optimal drought management model

Existing national policy
(resolutions, plans, programmes...)

Environment and nature protection
Climate change
Water resource management
Protection against natural disaster
Agricultural policy
Forestry policy
Fishery policy
Public health
Energy production
Transport
Tourism
Other sectoral policies...

Drought management plan

National policy
(legislation itself and the way it is implemented)

International, regional policy
(strategies, conventions, resolutions, agreements...)

Basis for the model: IDMP

Pillar I – Drought policy framework:
- Transnational policy
- National policy
- Operational implementation policy

Pillar II – Institutional scheme:
- Decision-making national level
- Operational national level
- Stakeholders level

DOCUMENTATION

IMPLEMENTATION

National Drought Authority

Drought Advisory Board

Reference Centres for drought

physical person

institution, organisation

legal interactions between involved bodies
Drought Watch report in Danube region 2018

Will Danube region experience drought in 2018 again? Let’s follow its development with DriDanube tools!

DriDanube Drought Watch
Regional Drought Situation

Drought User Service map
Impacts map

Be prepared. Know the risks. Take action.

For better understanding of droughts...

**Sustainable Drought Early Warning**
- active participation in existing platforms (global, regional – EDO, DMCSEE), sector specific indicators, harmonized data collection, methodologies (impact & risk).

**Networks**
- DMCSEE and consortium partners, IDMP project, EDO/EU JRC, **French partners**.

**Common projects/research**
- GWP/WMO IDMP programme, **new initiatives**, new projects (Alpine space), donors/funding search.

**Change of management paradigm**
- missing policy; DriDanube Strategy will be launched in 2019;

**Public awareness / capacity building /stakeholders involvement**
- drought news, media campaigns, subscribe for DriDanube newsletters;
- knowledge exchange, guidelines, manuals, trainings, publications, final conference (**Vienna, May 2019**).
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DriDanube project web page:
http://www.interreg-danube.eu/dridanube