



ARSO METEO
Slovenian Environment Agency



DMCSEE
*Drought Management Centre
for Southeastern Europe*

DROUGHT MANAGEMENT CENTRE FOR SOUTHEASTERN EUROPE

Overview

Existing and potential synergies

Ljubljana, 13 november 2024

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- Established in 2006
- ARSO: hosting institution; coordination and fund-raising
- Project collaboration:
 - Primarily practice of fund raising & joint work
 - **DMCSEE project** (TCP South East Europe, 2009-2012)
 - First joint project under DMCSEE community
 - Setting up regular regional drought monitoring
 - **DriDanube** (Danube Transnational Programme, 2017-2019)
 - Towards proactive drought management practices
 - Regionally harmonized products



DMCSEE TCP project



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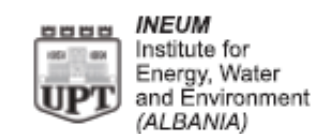


Transnational Cooperation Programme for SE Europe

15 partners from 9 countries

Time Period: 2009-2012

Not all countries participate!
(not all countries are eligible)



consortium



Main outcomes

Drought monitoring

- SPI
- Reanalysis based products
- Remote sensing based products

Vulnerability and risk assessment

Drought impact archive



Main outcomes

Drought monitoring

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- **Reanalysis based products**
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Vulnerability and risk assessment

Drought impact archive

Application of NWP for drought monitoring NMM regional model nested into ERA

DROUGHT RELATED VARIABLES

Water Balance anomaly
Soil moisture
Temperature (degree days)

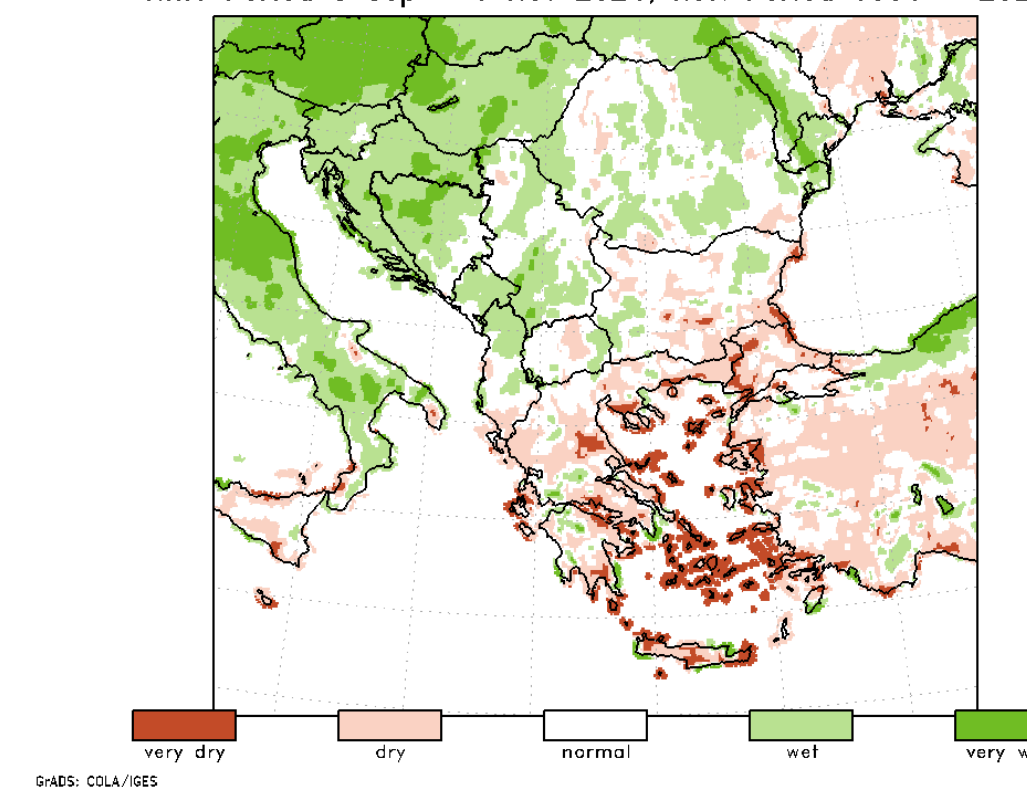
DROUGHT RELATED TIME SCALE

Decade (10-day)

DROUGHT RELATED INTERPRETATION

Deviation from normals, percentiles

Comparison of 60 Days Water Balance Accum. with Hist. Perc.Classes
Time Period 8 Sep – 6 Nov 2024, Ref. Period 1991 – 2020



Downscaling using regional model is being abandoned

**Available in monthly drought bulletin.
More: presentation „DMCSEE operational work“ at 15:10**



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Vulnerability and risk assessment

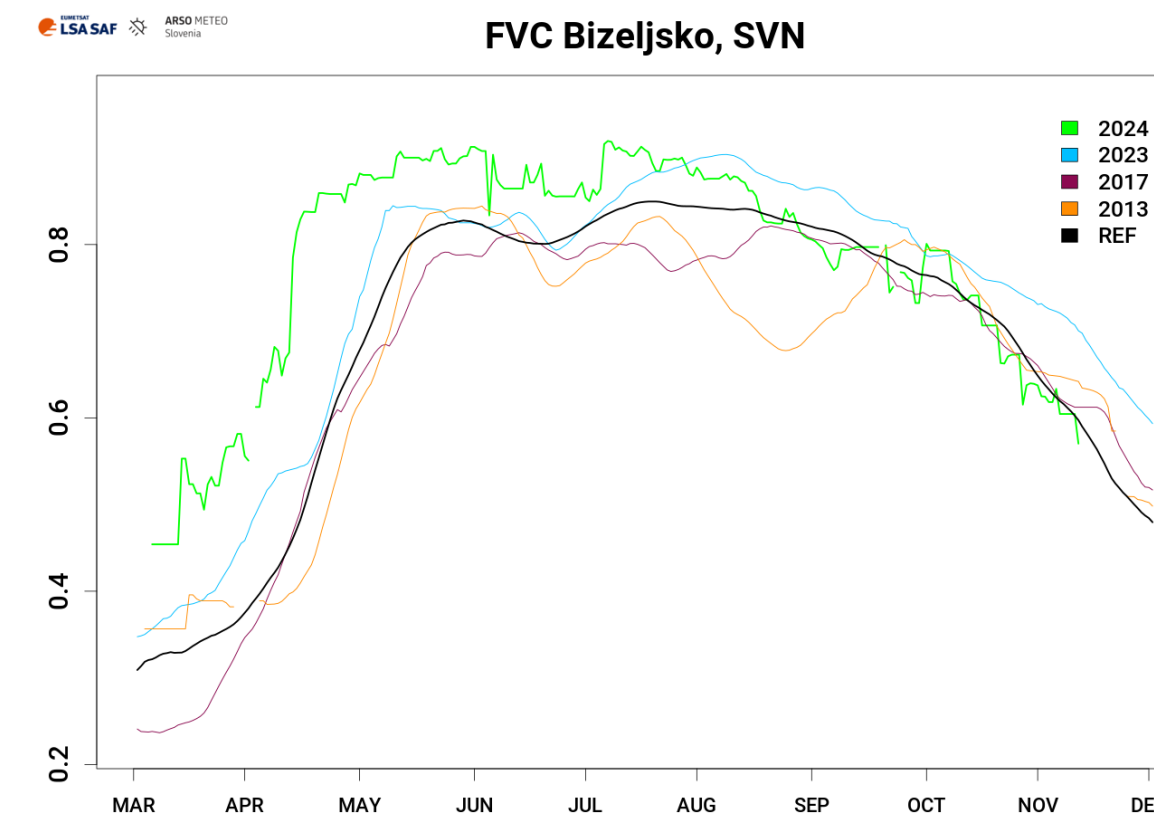
Drought impact archive

Fraction of Vegetation Cover (FVC)

fraction of the surface within satellite pixel covered by green vegetation

data provided by EUMETSAT
(processing done by LSA-SAF)

Spatial resolution is limiting factor—
homogenous surface ~ 1500 ha





Main outcomes

Drought monitoring

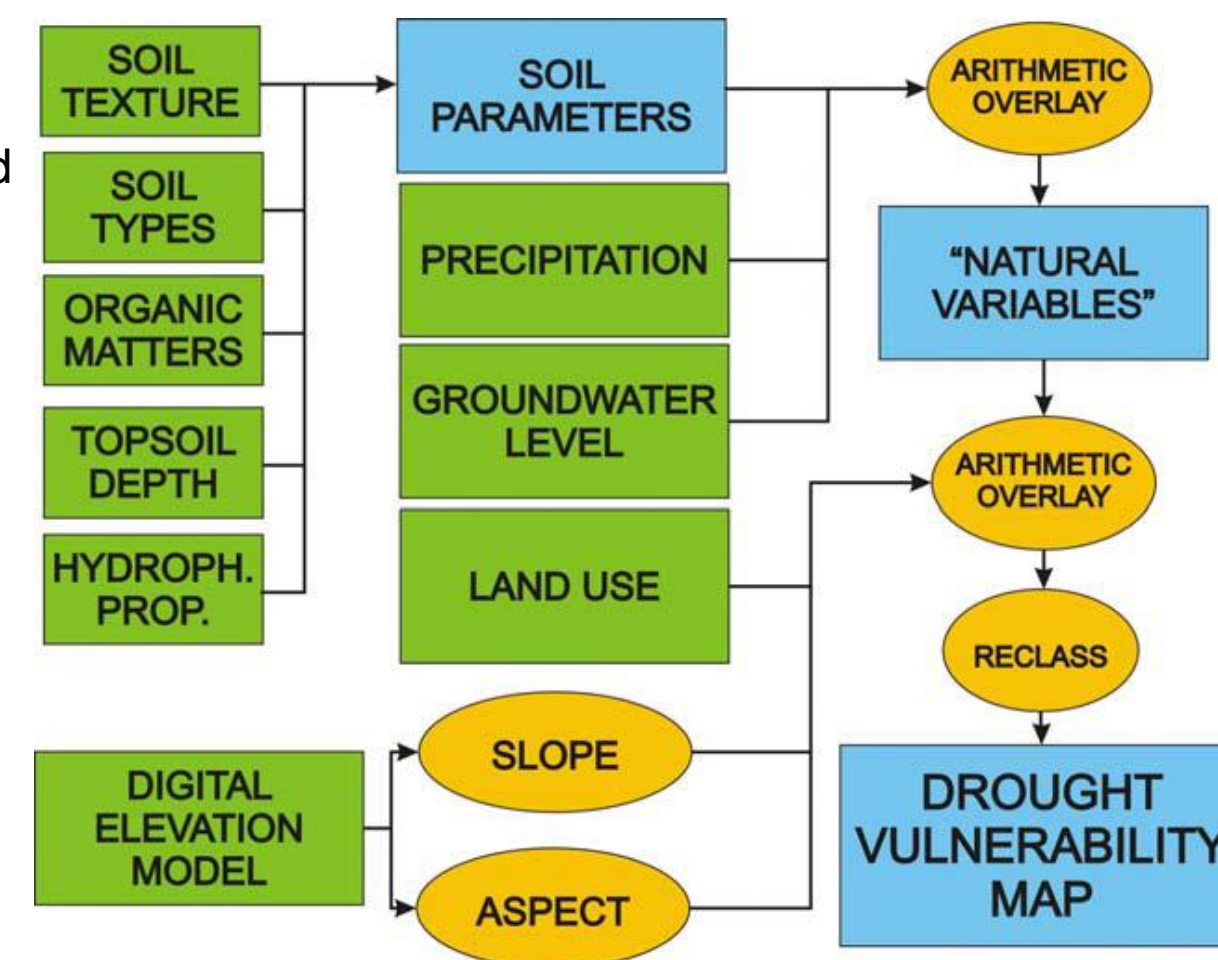
- SPI
- Reanalysis based products
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Vulnerability and risk assessment

Drought impact archive

Assessing Vulnerability to Agricultural Drought (Methodology: Nebraska Case Study (Wilhelmi & Wilhite, 2002))

Bio-biophysical and social factors overlaid and weighted





Main outcomes

Drought monitoring

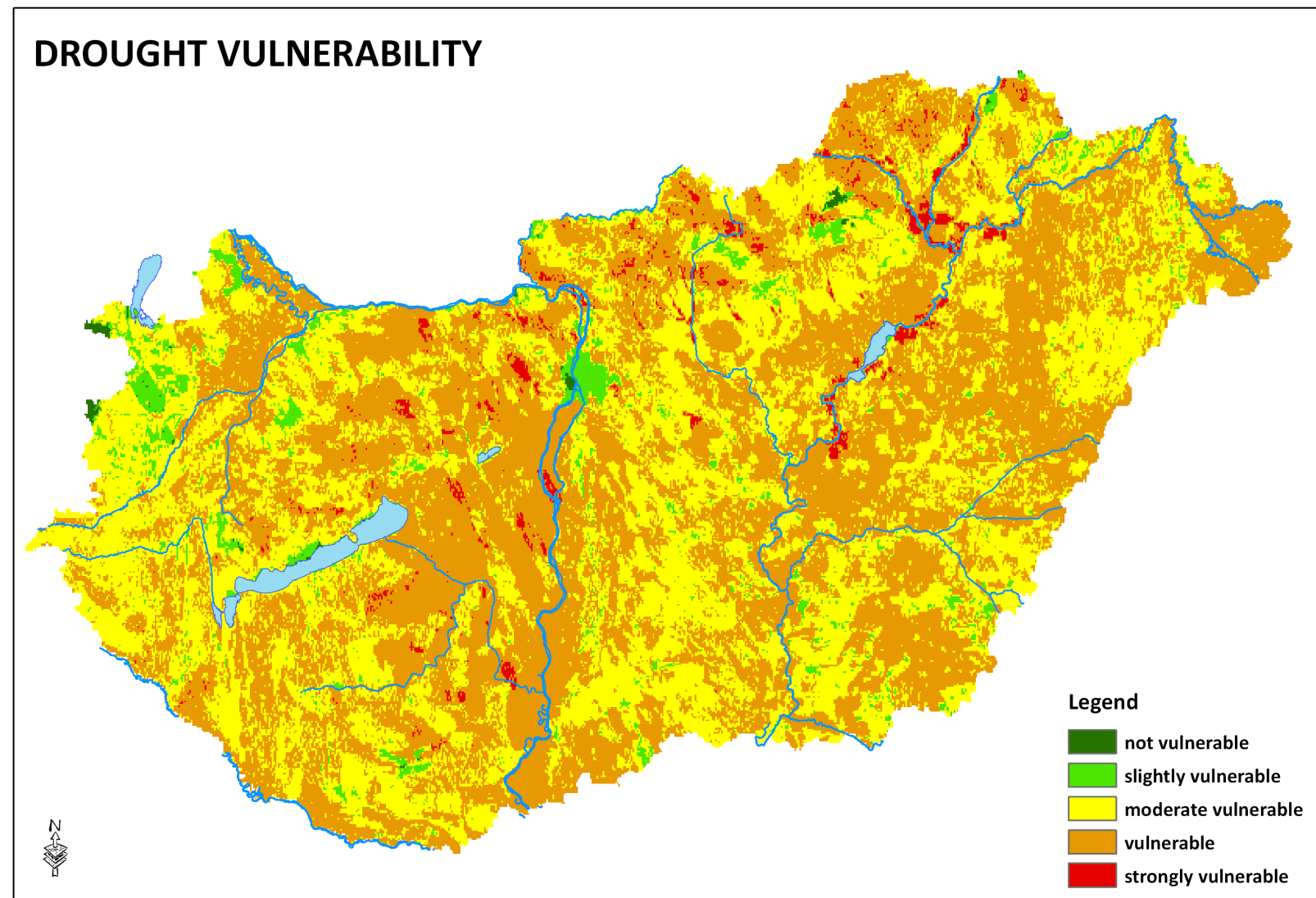
- SPI
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Vulnerability and risk assessment

Drought impact archive

Assessing Vulnerability to Agricultural Drought (Methodology: Nebraska Case Study (Wilhelmi & Wilhite, 2002))

Example of results: Hungary





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Vulnerability and risk assessment

Drought impact archive

Country	Location	Source	Date	Abstract
Albania	Tirana	Eco movement	19/1/2007	Drought. Electricity interruption, fauna of water get up to the shore.
Albania	Tirana	Eco movement in Albania	28 August 2007	Emergency. Evacuate 90 household because of the fire in entire Albania.
Albania	Tirana	Gazeta Panorama	30/10/2007	Drought. 33% of average production from Fierza HPP
Bulgaria	Whole country	Koleva, Alexandrov (2008);	1992	Dry year upon climate records and different drought criteria
Bulgaria	Whole country	Raev et al., 2003	1993	Economical losses of wheat yield production 72.3 mln \$ and of 102.2 mln of maize production
Croatia	Korčula island	Newspaper articles	Spring 2001	2 to 5 litre rain in 50 days
Croatia	NW Croatia, Dalmatia,	Newspaper articles	Summer 2001	Drought threatening agriculture, water supply
Croatia	Imotski region	Newspaper articles	Autumn 2001	Drought threatening agriculture, water supply, Blue lake dried

DriDanube project



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Main outcomes

Danube drought strategy

Risk assessment

Drought user service

DriDanube project



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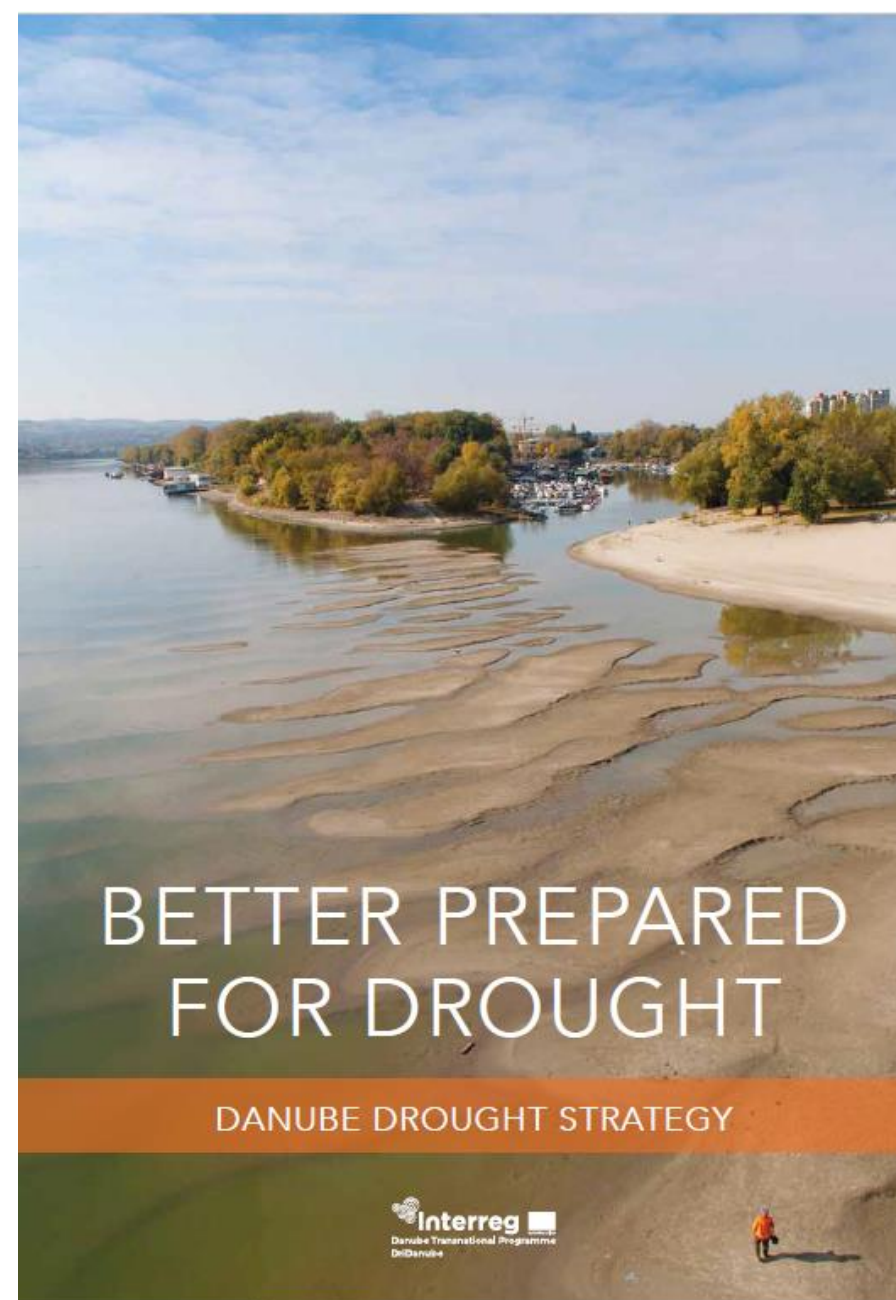


Main outcomes

Danube drought strategy

Risk assessment

Drought user service



Summary for policy makers	10
Introduction to this document	13
1 Drought issue and aim of the Danube Drought Strategy	14
1.1 Drought as an increasing problem	14
1.2 Issues in coping with drought	16
1.3 Aim of the Danube Drought Strategy	17
2 State of the art – legal and institutional challenges	18
2.1 Relevant international policies	18
2.2 National drought management status	21
3 Foundation for improved drought management	25
4 Optimal drought management model (ODMM)	27
4.1 Drought policy framework and institutional cooperation scheme	29
4.2 Protocol of actions	36
5 Assisting a country in Danube Drought Strategy/ODMM implementation	41
5.1 Proposed activities for ODMM implementation	41
5.2 DriDanube tools supporting the implementation	43
5.3 Danube River Basin: progress so far and outlook in DriDanube countries	47
6 Way forward	52
6.1 Danube Drought Strategy implementation possibilities at national level	52
6.2 Ongoing drought management improvements	53
6.3 Recommendations for the sustainability of the Danube Drought Strategy at national level	55
Annexes	56



Main outcomes

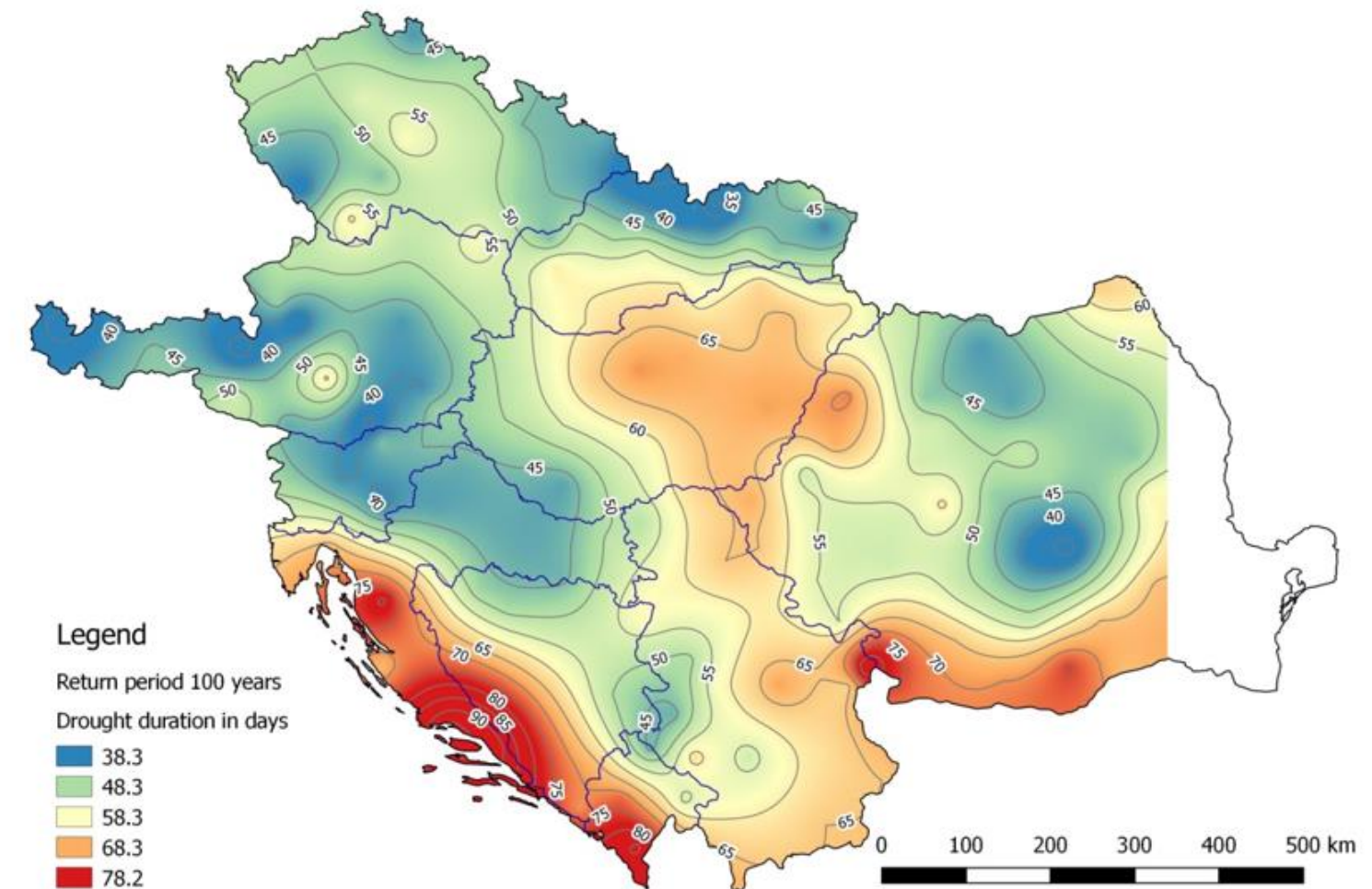
Danube drought strategy

Risk assessment

Drought user service

Hazard component

Analysis of extreme rainless periods as approach to drought hazard based on ZT method





Main outcomes

Danube drought strategy

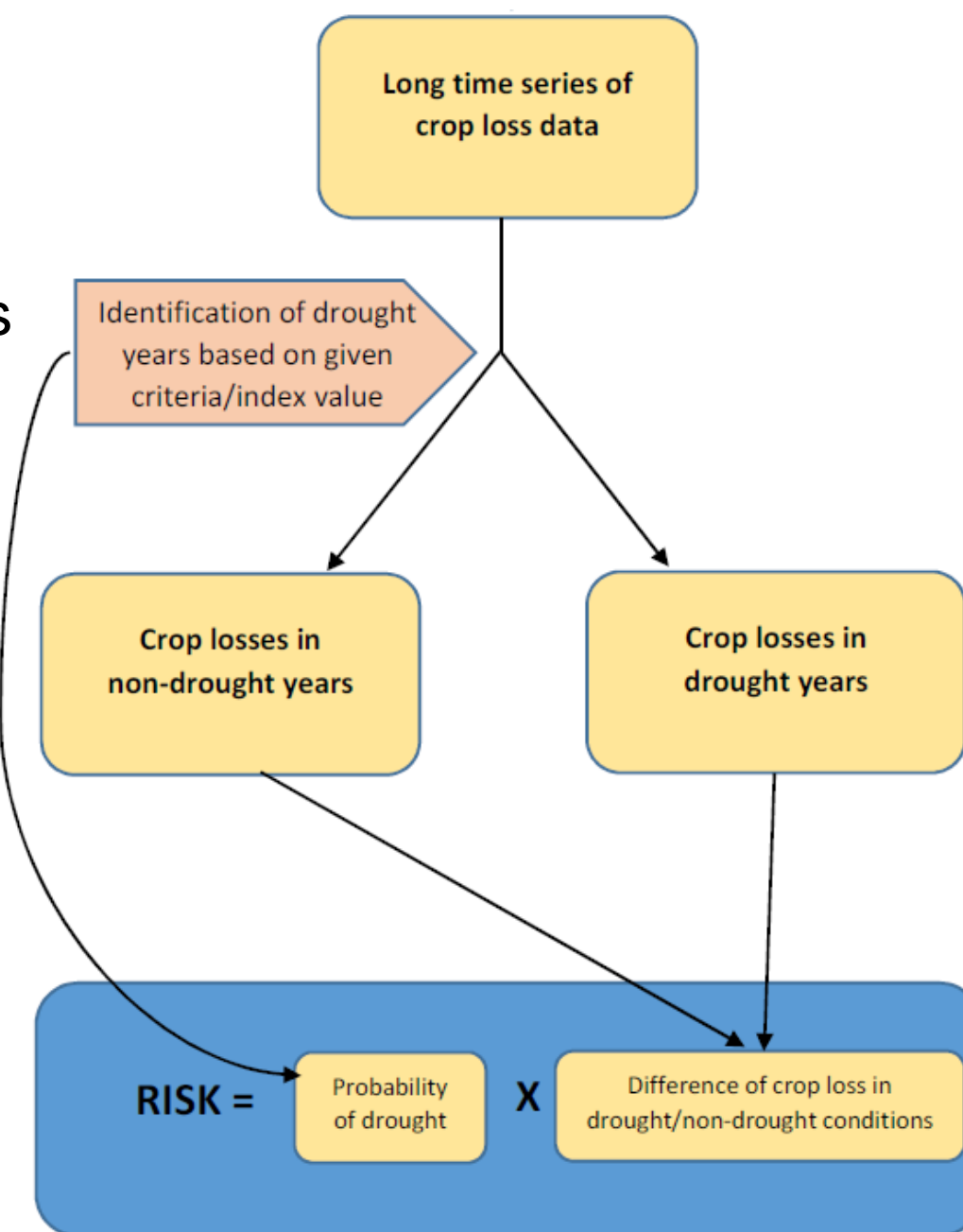
Risk assessment

Drought user service

Risk component

Risk calculation:

- Separation of years to drought / non-drought years based on chosen index
- Difference of expected crop loss in both categories, multiplied by probability of occurrence, is expected yearly loss due to drought





Main outcomes

Danube drought strategy

Risk assessment

Drought user service

Risk component

Risk calculation:

- Risk Estimation of Drought software package

Risk Estimation of Drought

(R E D v1.01)

Tamás Szentimrey

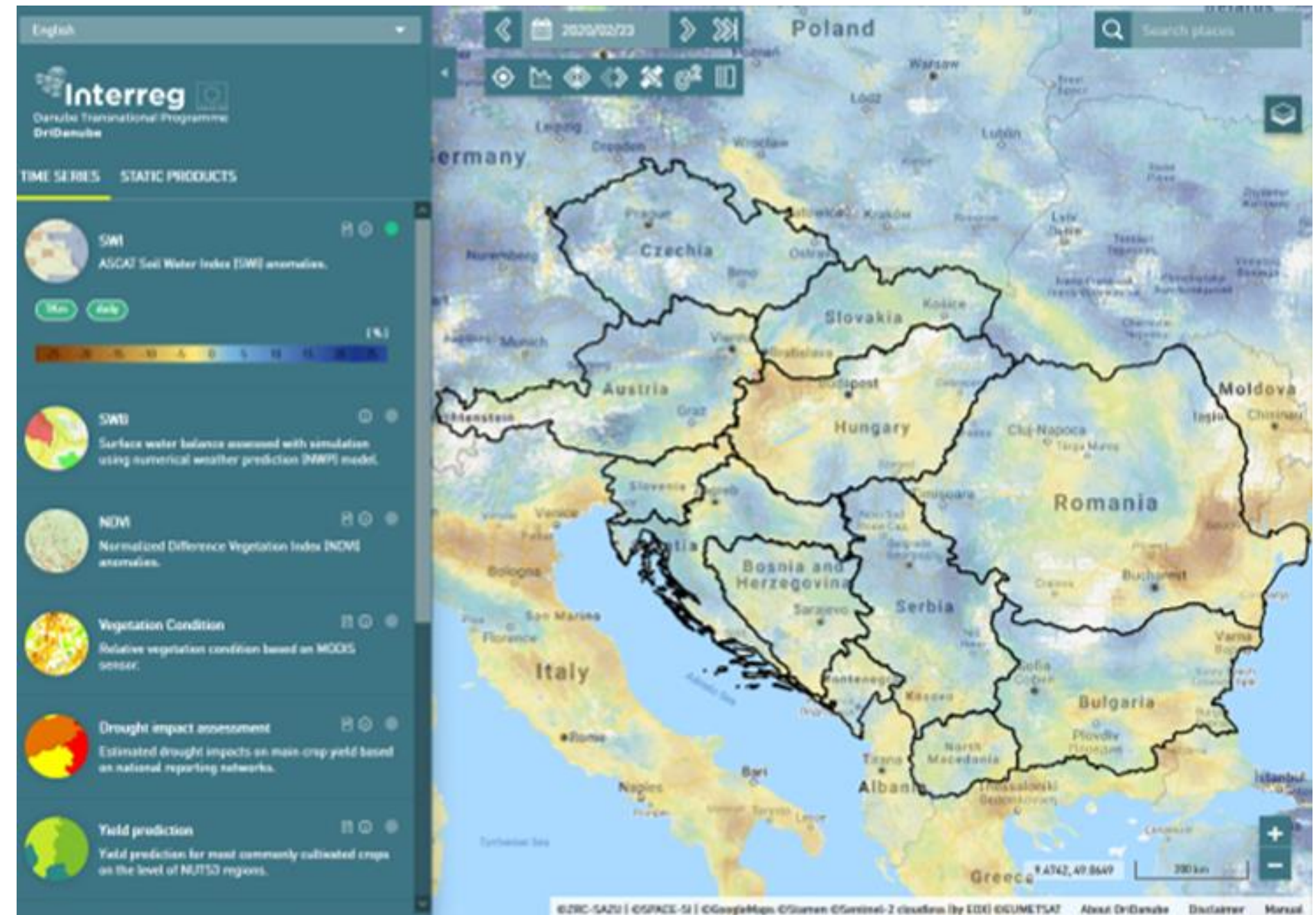
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I. INTRODUCTION.....	2
II. MATHEMATICAL BACKGROUND	3
III. THE STRUCTURE OF PROGRAM SYSTEM	4
IV. THE MAIN STEPS OF RISK ESTIMATION	5
V. THE MAIN INPUT/OUTPUT FILES	8
VI. REGRESSION PARAMETER FILES (REG.PAR)	11
VII. EXAMPLE: MAPPING OF RISK FOR HUNGARY	12

Drought User Service - DroughtWatch



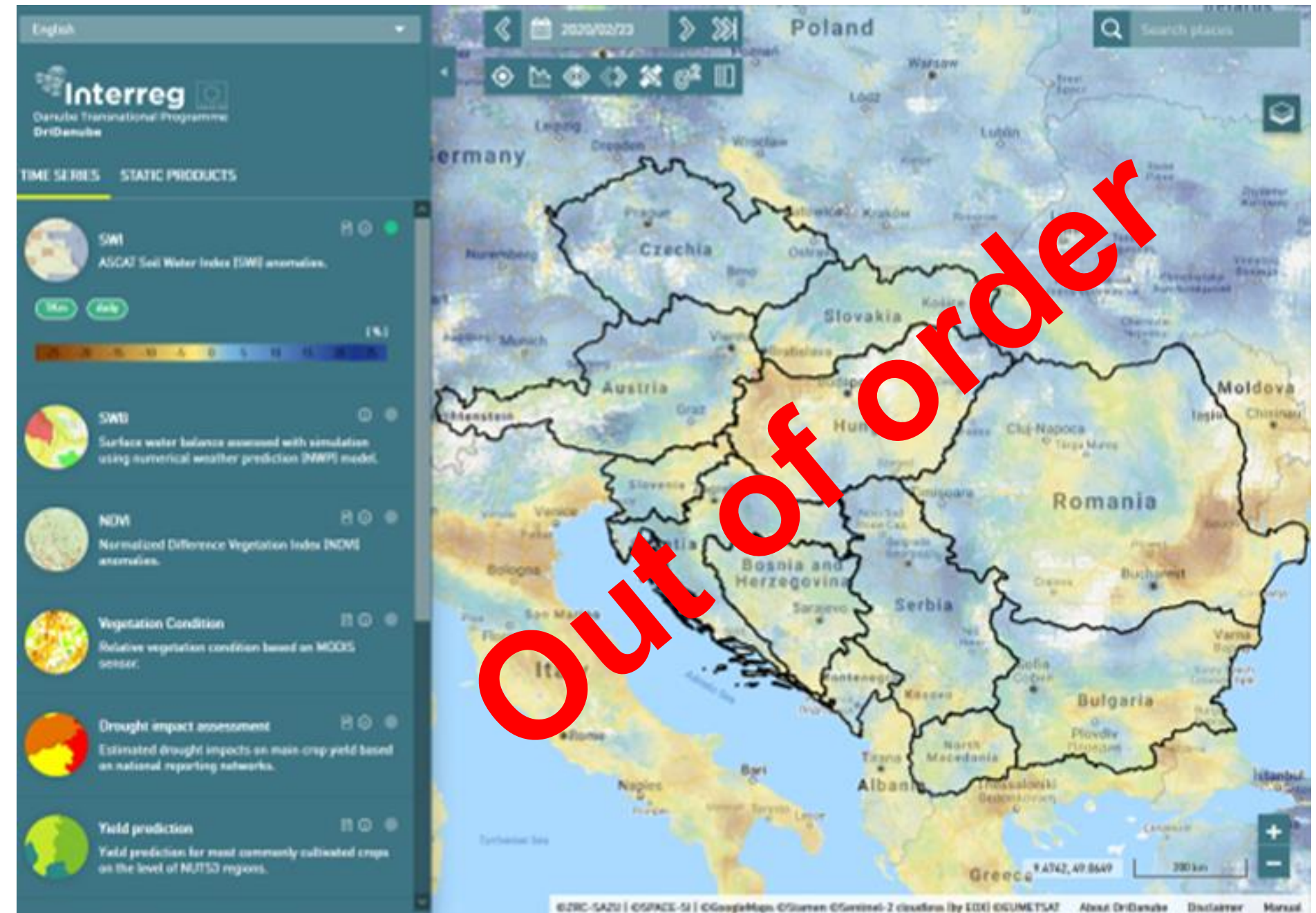
Main outcomes

Danube drought strategy

Risk assessment

Drought user service

Drought User Service - DroughtWatch



Main outcomes

Danube drought strategy

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Drought and Flood tracking

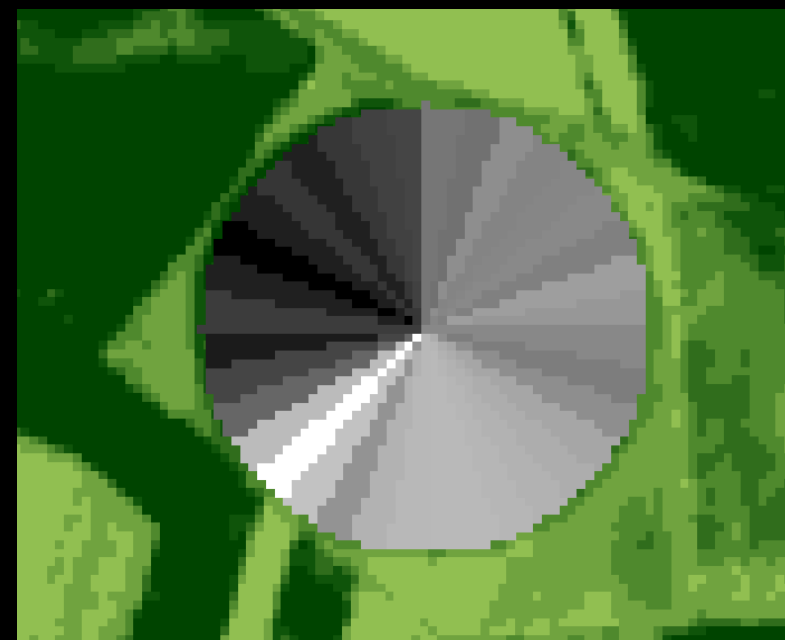
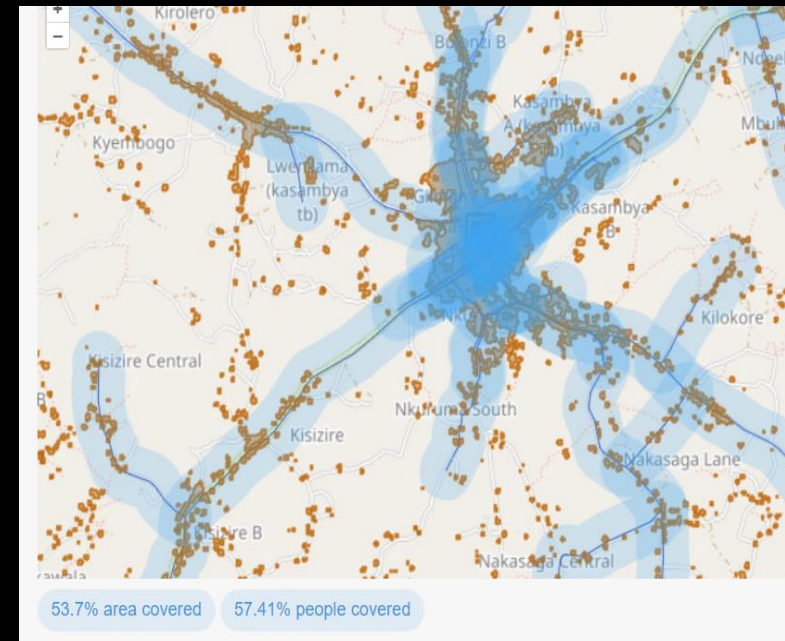
- Surface Water monitoring (vodakje.si)
- Wetland conditions monitoring
- Smart irrigation

Earth Observation & AI

- EO services
- AI and machine learning solutions
- AI models for Earth and space

Geo Informatics

- Water management systems
- GIS
- Spatial Analyses



Layers

 **Vegetation Condition**
Condition of vegetation

 **Yield Prediction**
Prediction of crop yield

 **ESI**
Evaporative Stress Index

 **Drought Impacts**
Impacts of drought

 **Satellite Soil Moisture**
Moist of soil

