Applying meteorological data for risk assessment in agriculture

Agrometeorologist for farmers in hotter, drier, wetter future

9 and 10 November 2016

Venue : M Hotel, Ljubljana, Slovenia

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Content:

- Meteorological measurements and observations
- Activities in the area of agrometeorology
- The situation before and after the DMCSEE project
- Drought monitoring ,vulnerability- example

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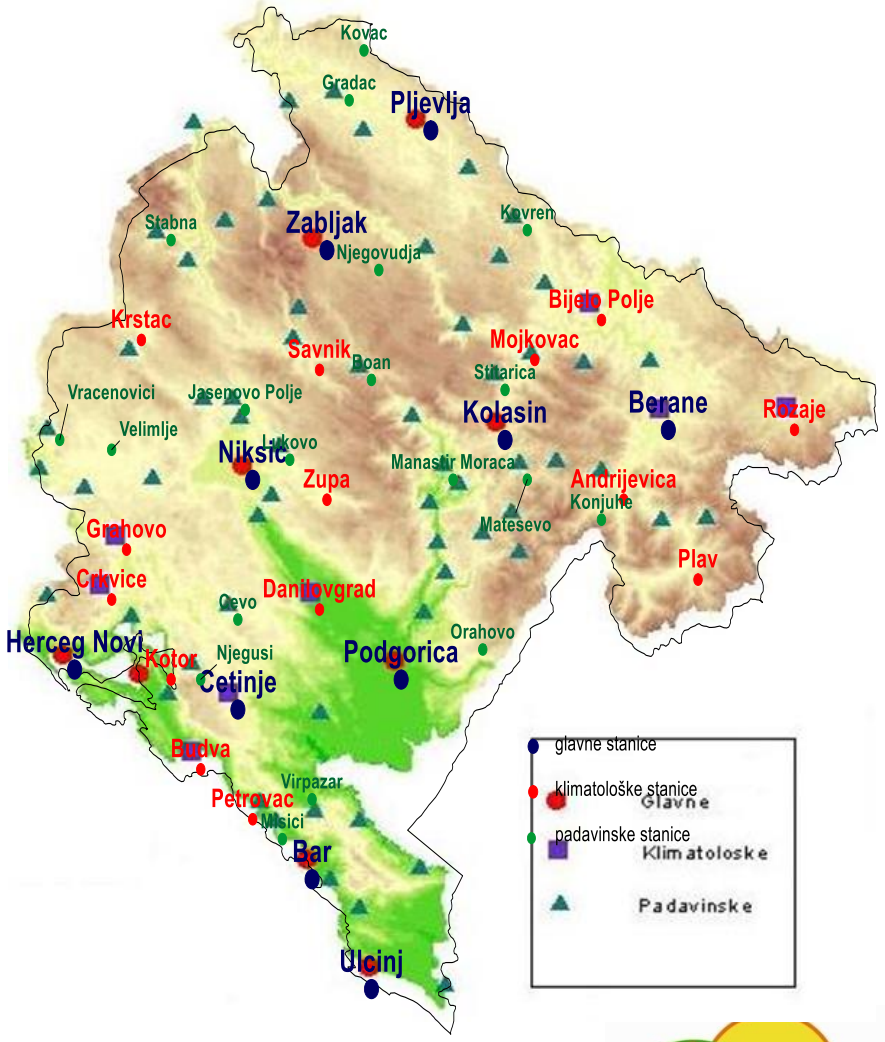
Sector of meteorology:

- ✓ *Meteorological observation network*
- ✓ *Weather forecast*
- ✓ *Regional products - seasonal forecasts through SEECOF (SEEVCCC), DWD, etc.*
- ✓ *Monitoring and assessment of climate extremes and climate change*
- ✓ *Applied Meteorology in engineering, agrometeorology and monitoring of drought*
- ✓ *At present 41 meteorological stations*
- ✓ 9 main stations
- ➢ 13 climatological and
- ➢ 19 precipitation stations

Meteorological observation network



MAIN STATIONS

1. ULCINJ
2. BAR
3. H.NOVI
4. PODGORICA
5. NIKŠIĆ
6. KOLAŠIN
7. ŽABLJAK
8. PLJEVLJA
9. CETINJE

9 AWS –Lambrecht, Germany, 7 sensors, GPRS communications
3 AWS – OTT Hydrometrie, 3 sensors, GSM communications

Aeronautical meteorological Stations:

1. **Tivat** and
2. **Golubovci**

Observations on main stations are done hourly, and

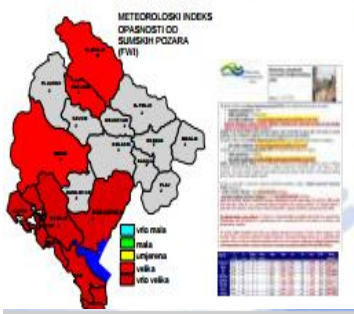
data are available on www.meteo.co.me

Climate services in Department of Applied Meteorology

- Drought monitoring (using SPI index and satellite data for FVC (Fraction Vegetation Cover index) and LAI (Leaf Area Index) for the vineyards AD Plantaze
- analysis and monitoring of the soil temperature
- **Agricultural bulletin based on climate services→**
- Activities within the project: Drought Management Centre for South-Eeastern Europe – DMCSEE, http://www.dmcsee.org/
- data about the values of meteorological parameters on the request for scientific work and research in agriculture
- information on analysis of phenological data according to customer requirements and other types of information related to agriculture

- Staff:
- 3 agricultural engineers

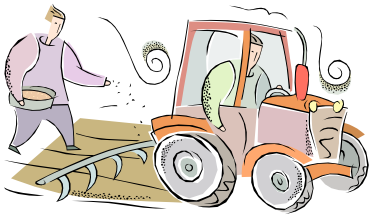
- Activities:
- monitoring soil temperature
- agrometeorological bulletins
- Fenology
- FWI-not permanently



AGROMETEOROLOGICAL BULLETIN

MAY 2014	NK	KOL	PV	PG	BR	UL
Air Temperature °C						
Tmax at 2m	26.2	27.2	28.5	30.6	27.2	27.8
Tmin at 2m	3.2	-1.6	1.2	8.2	10.4	10.1
Tav at 2m	13.5	11.9	12.5	19.1	17.8	17.7
Tmin at 5 cm	-1.0	-4.0	-8.0	7.0	6.0	7.0
Soil Temperature °C						
Tmax at 5 cm depth	26.4	22.8	24.3	27.9	35.5	x
Tmin at 5 cm depth	10.9	7.3	8.7	15.0	12.1	x
Tmax at 20 cm depth	19.5	18.1	19.4	25.9	28.0	x
Tmin at 20 cm depth	12.7	10.1	10.4	13.7	16.0	x
Precipitations						
Total precipitations (mm)	101.9	96.6	115.4	64.0	60.8	113.8
No of rainy days (≥1mm)	12	14	14	9	8	11
Snow depth max (cm)	0	0	0	0	0	0
Soil condition (prevails)	1	1	1	1	1	1

A few years ago, IHMS processed meteorological danger indices of occurrence of forest fires, "the state of risk of fire on that day"- FWI.



DATABASE OF SOIL TEMPERATURES

(10 agrometeorological stations)

2, 5, 10, 20, 30, 50 i 100cm

PHENOLOGICAL BASE
(25 phenological stations)

7 basic categories

- **fruit growing**
- **wine grape**
- **farming**
- **forest trees**
- **plant diseases and pests**
- **beekeeping**
- **general field work**

IHMS
METEOROLOGY

Drought monitoring, management and respective key players

- Drought monitoring: Department of Agrometeorology (H-IM)

- Respective key players:
- The Ministry of Agriculture, Forestry and Water Management
- Agricultural sector: olive production, organic agriculture, fruit and vineyard (viticulture and enology)
- Biotechnical Institute/Faculty
- Agency for Environment
- Agency for development of small and medium-sized enterprises
- Committee for agriculture and food processing industry
- Energy sector
- National, regional and local water management authorities

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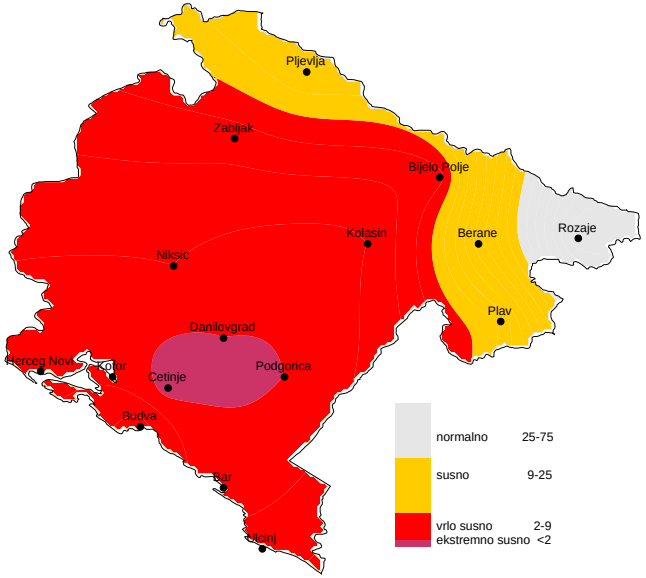
Drought monitoring status

- Before the project IPA DMCSEE:

1. no permanent drought monitoring
2. sparse anaysis of the drought
3. Intensity of precipitation deficit based on percentile analysis
4. vulnerability assessment not existed
5. In 2003 – an initiative to calculate SPI was unsuccessful
6. Evident - insufficient knowledge and urgent need for trainings

- During and after the DMCSEE project:
- Permanent drought monitoring based on SPI

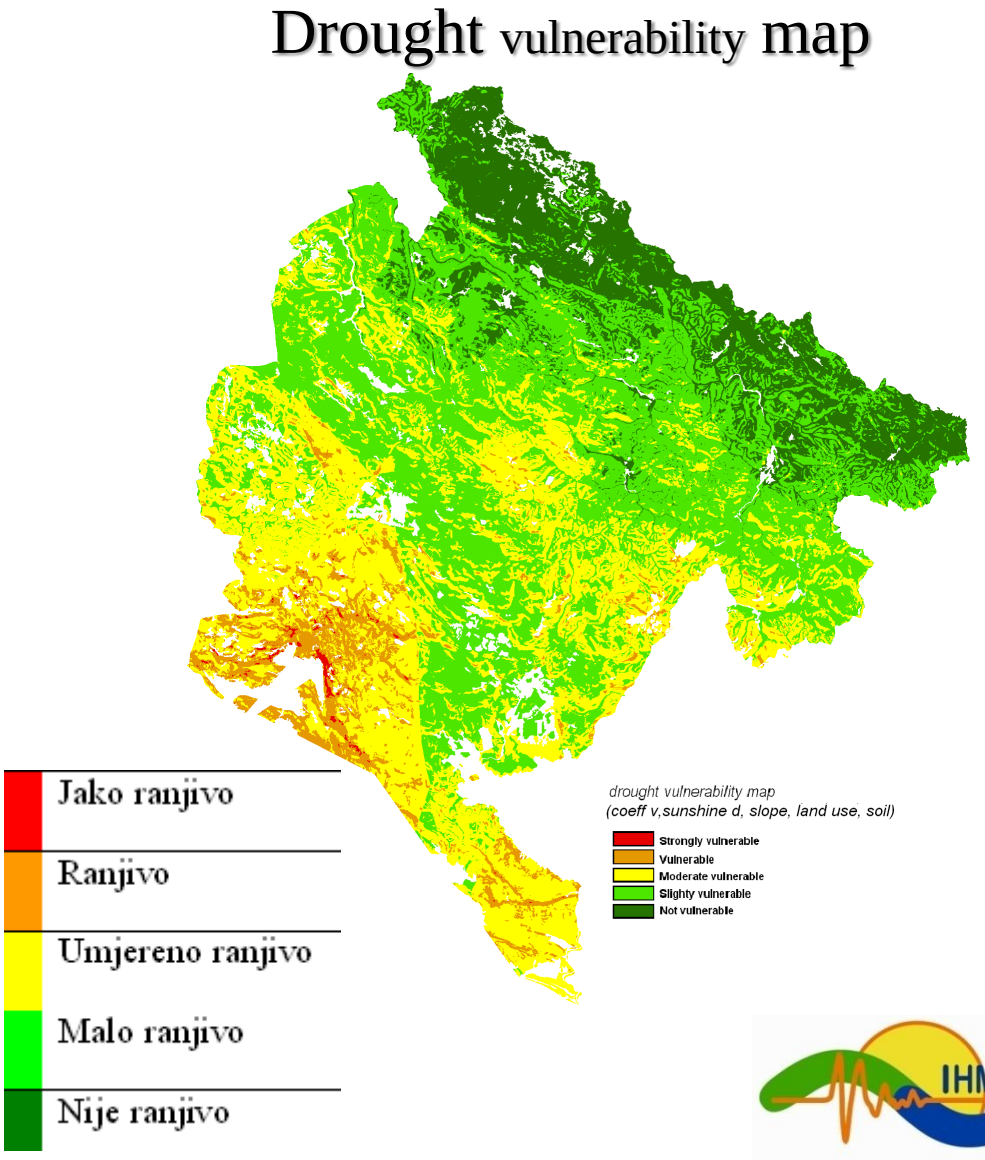
Raspodjela percentila kolicine padavina za jesen 2011.godine



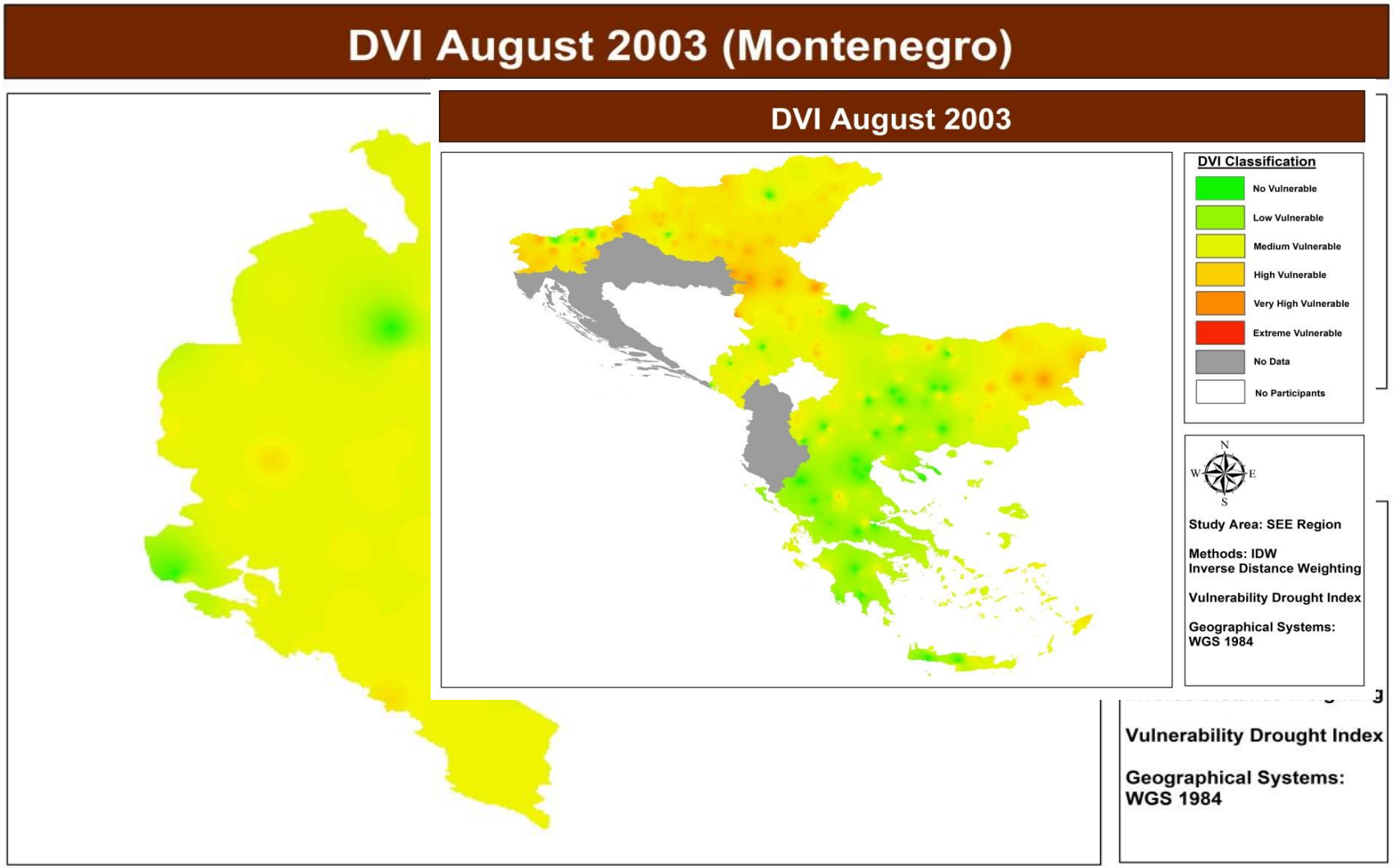
Analysis of percentiles-precipitation conditions in Autumn 2011

- Drought impact archive - created
- vulnerability – assessed
- Trained staff for SPI monitoring, drought vulnerability and risk assessment

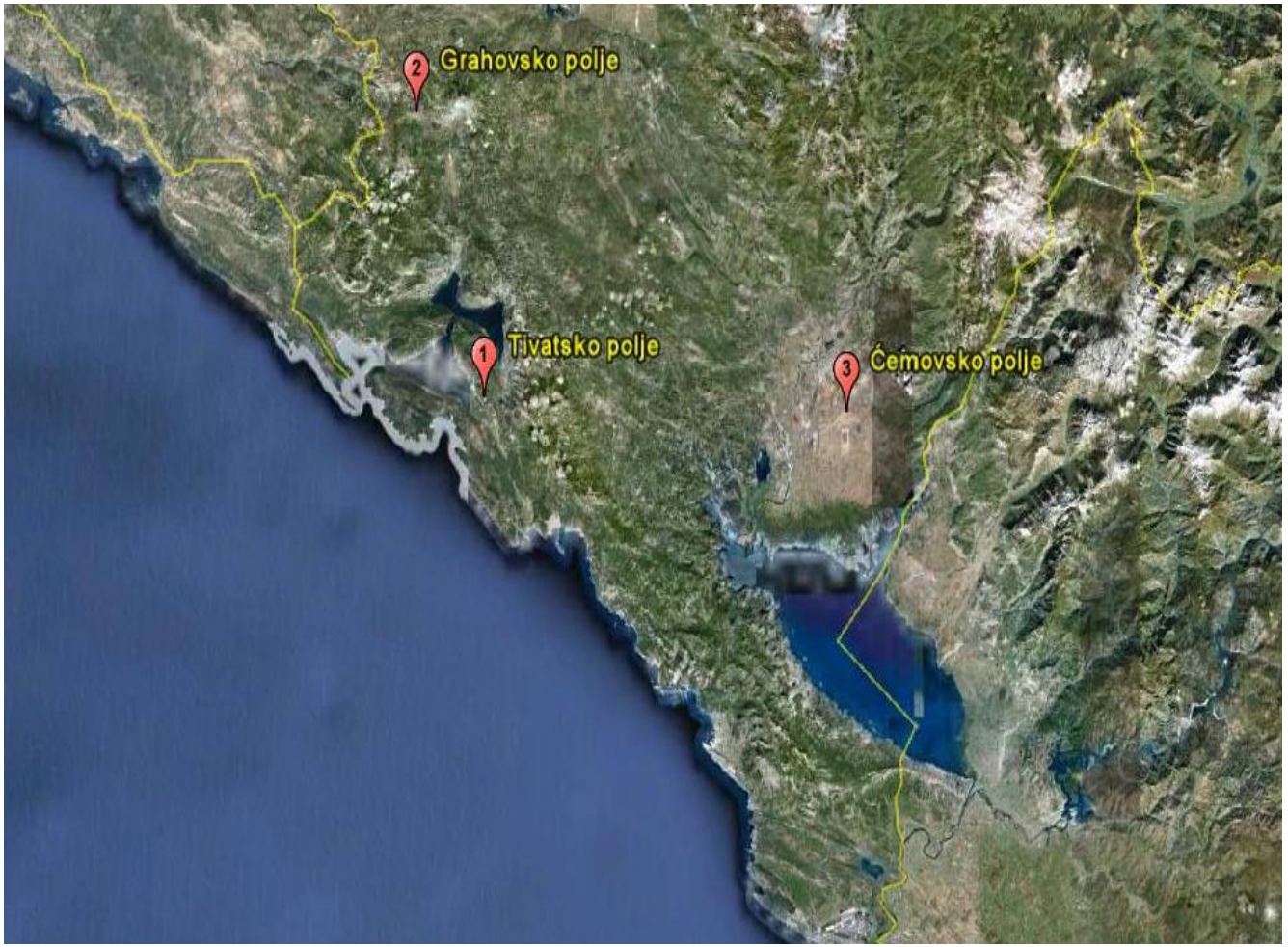
DMCSEE – Drought vulnerability map



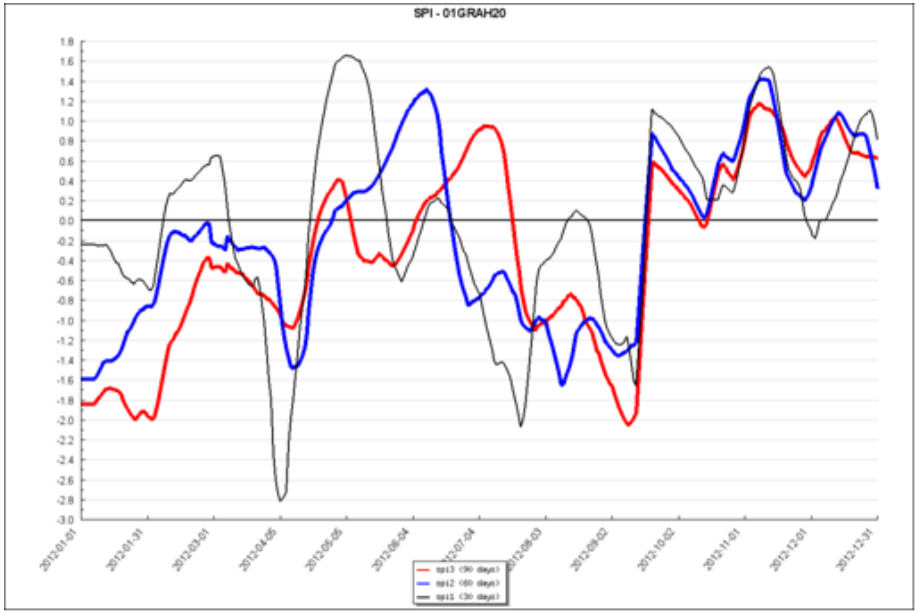
DMCSEE example: vulnerability DVI above SPI 6 and SPI 12 for August 2003

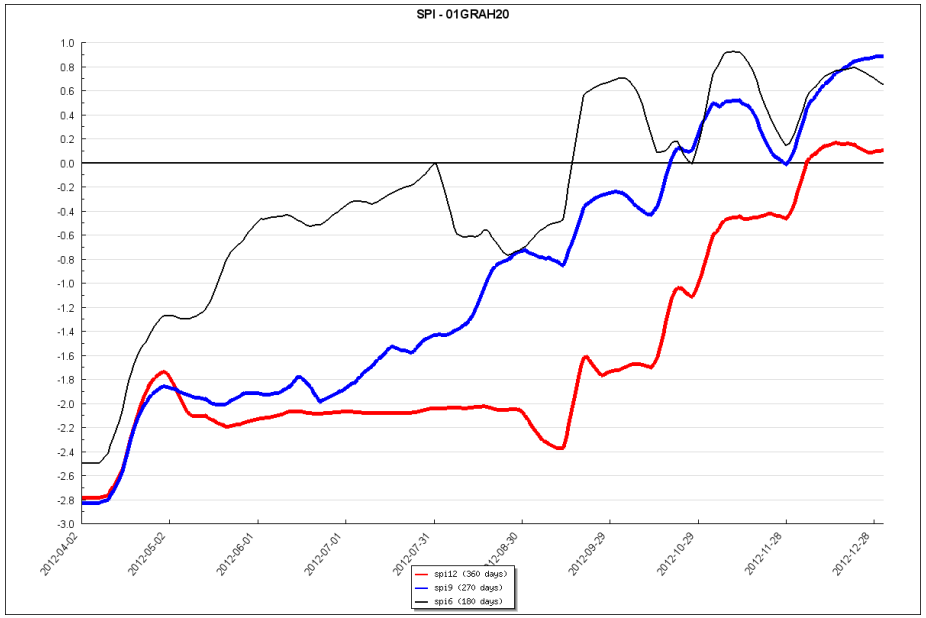


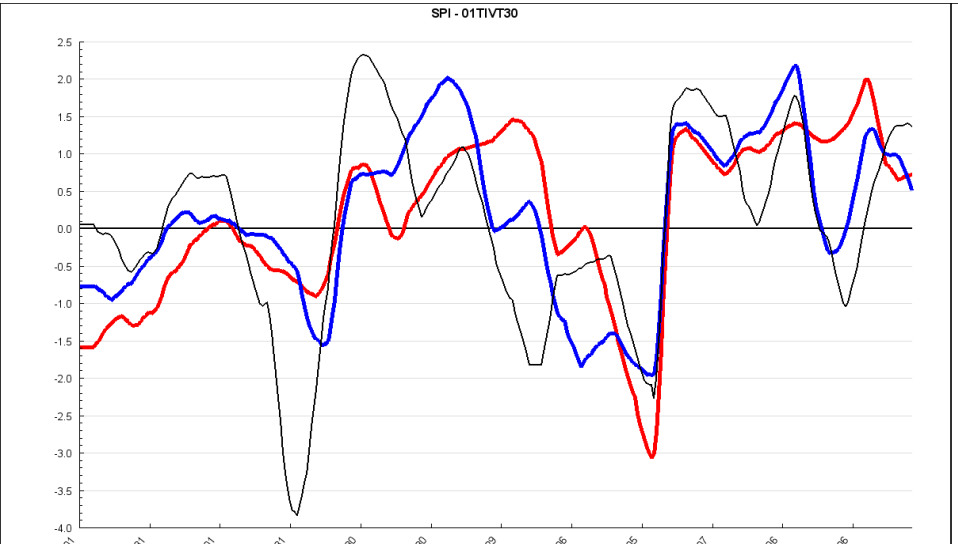
DROUGHT MONITORING: **SPI,FVC,LAI**

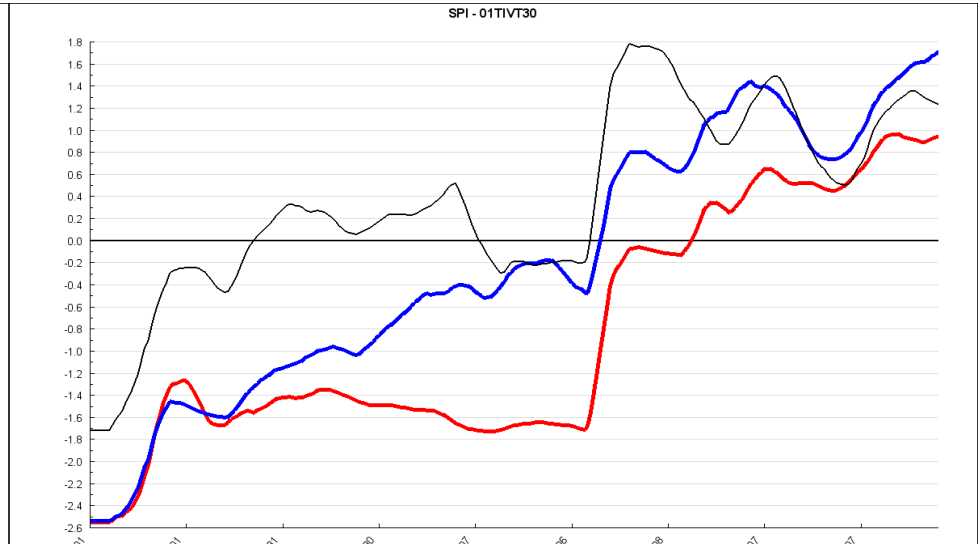


Example: SPI from day to day 17- 31 August 2012



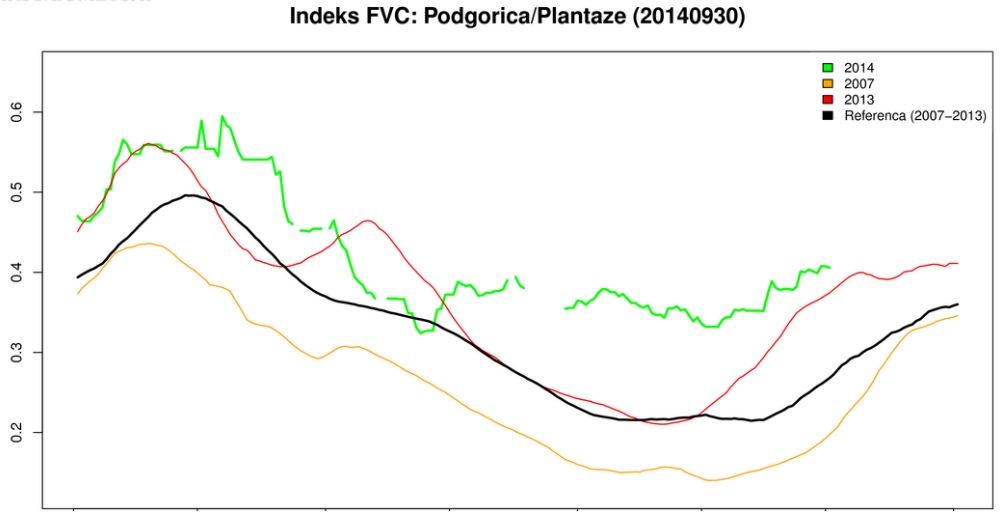


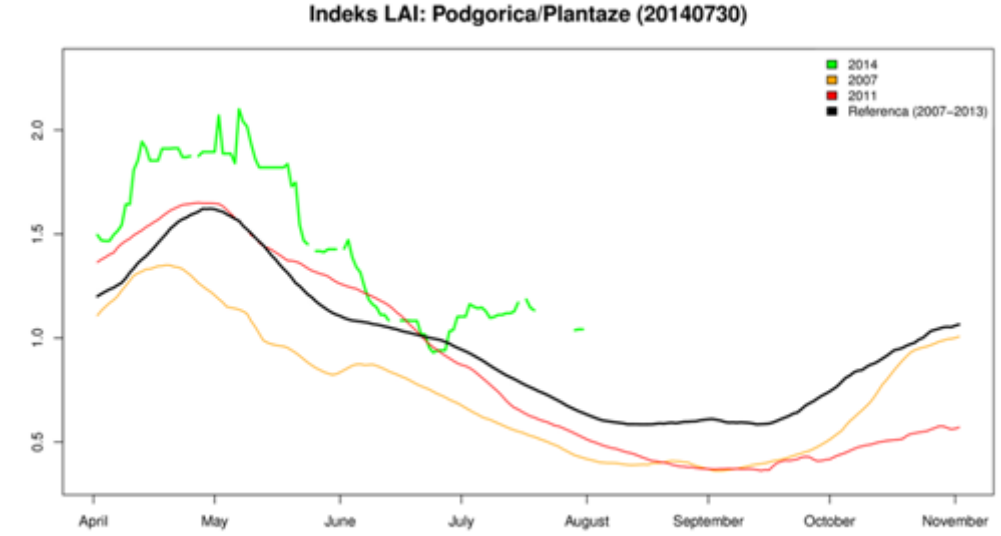




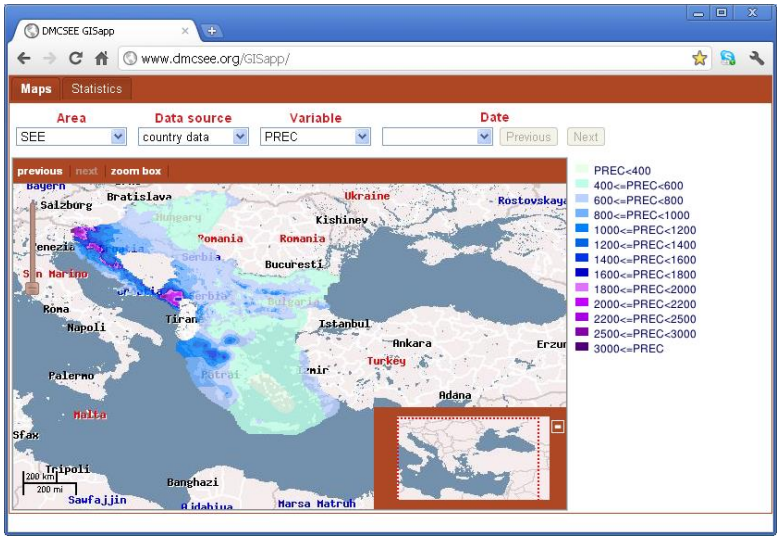
Example : satellite data - index FVC and LAI for area Plantaža (near Golubovci)

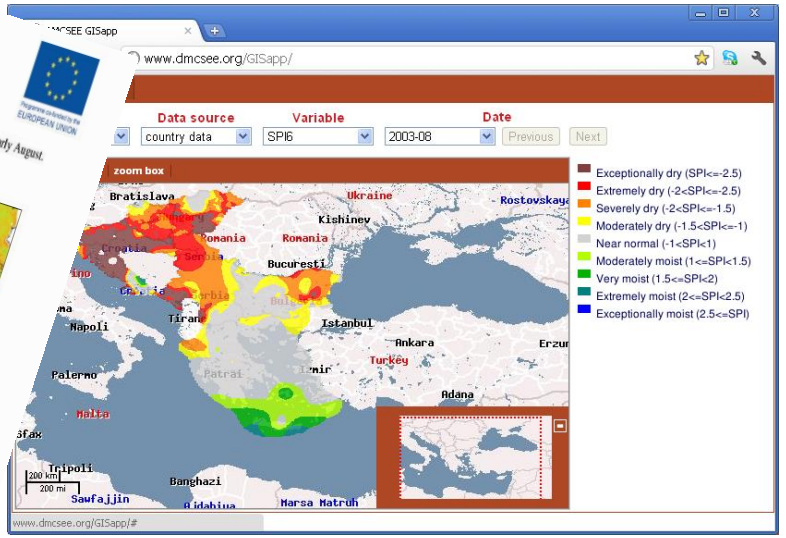
Homogeneous area 4x4 km





- **DMCSEE bulletins and maps SPI index and rainfall** – available at www.dmcsee.org





ydrometeorological Service of Montenegro :: Agrometeorologija - Windows Internet Explorer

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ZHMS

Zavod za hidrometeorologiju i seizmologiju

Pretrazivanje sajta:

teorologija Hidrologija Ekologija Hidrografija Seizmologija

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AGROMETEOROLOGIJA

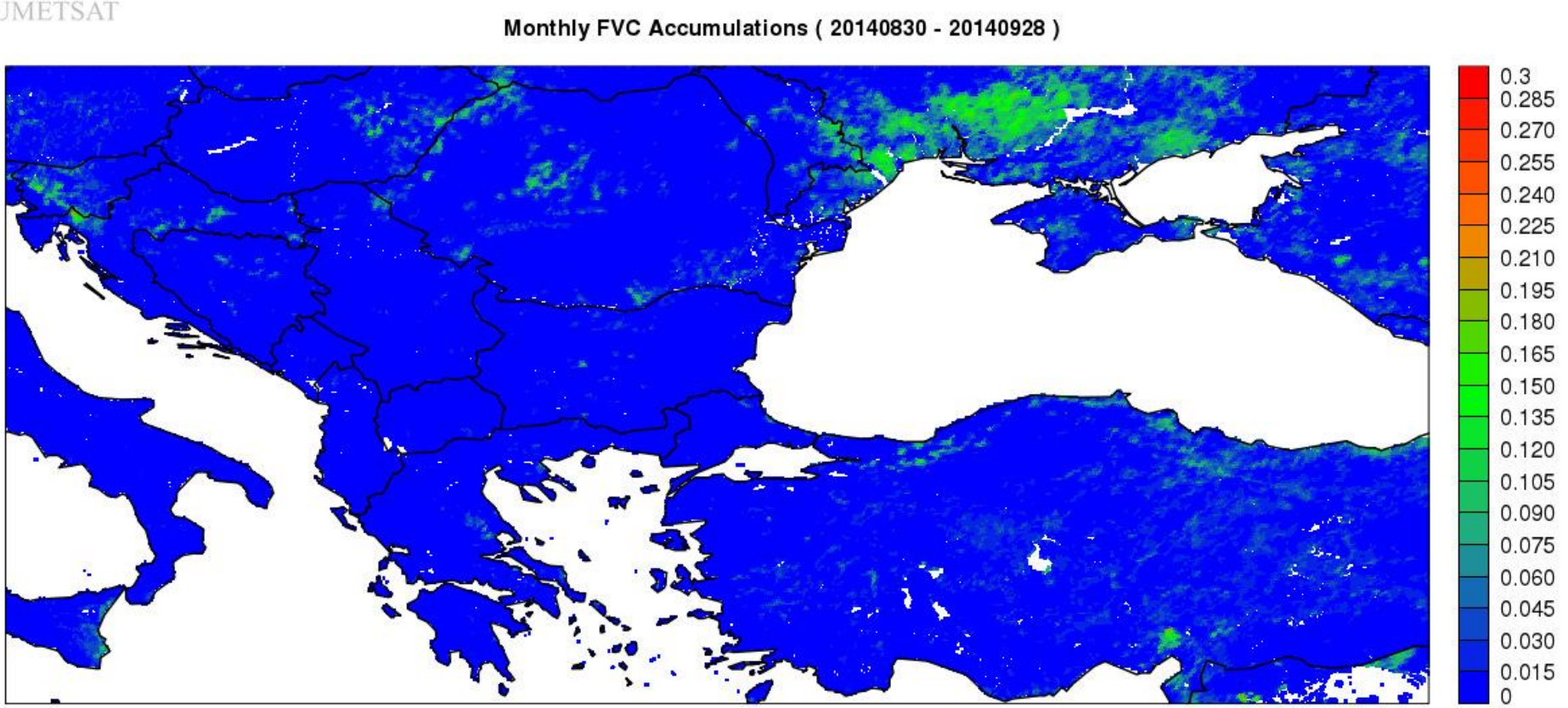
Agrometeorološki poslovi se u Hidrometeorološkom zavodu Crne Gore obavljaju od 1951. godine. Glavne aktivnosti odsjeka za agrometeorologiju se odnose na prikupljanje, unos i kontrolu podataka sa mreže agrometeorolških stanica, što podrazumijeva:

-Obradu, kontrolu i analizu podataka o temperaturama zemljišta, fenologiji i evapotranspiraciji.
-Izradu agrometeoroloških informacija, biltena i godišnjaka.
-Izradu i pružanje odgovarajućih informacija i usluga po zahtjevu korisnika:
*Izračunavanje meteorološkog indeksa opasnosti od šumskih požara.
*Izradu specifičnih agrometeoroloških informacija i prognoza za pojedina područja.
*Pružanje stručne pomoći korisnicima pri vršenju agrometeoroloških mjerenja.
Odsjek za agrometeorologiju raspolaže sa dvije operativne baze podataka i to: fenološkom bazom sa podacima sa 25 fenoloških stanica i bazom podataka o temperaturama zemljišta sa 10 agrometeoroloških stanica.
Fenološka baza sadrži podatke razvrstane u sedam osnovnih kategorija i to: voćarstvo, vinova loza, ratarstvo, šumsko drveće, biljne bolesti i štetočine, pčelarstvo i opšti poljski radovi.

Internet

DMCSEE – present situation

EUMETSAT



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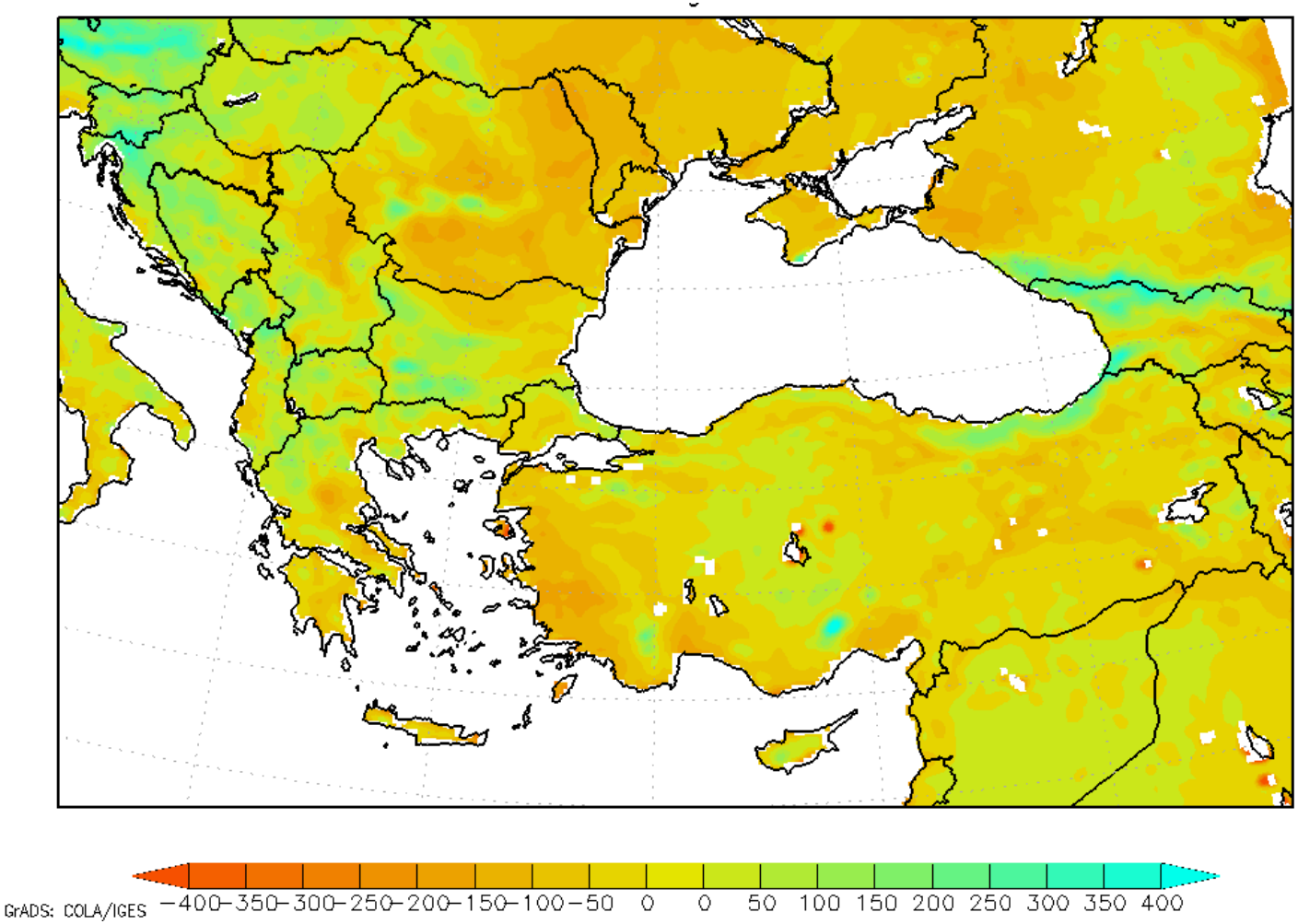
DMCSEE – example: prospects of drought 9 August to 7 October



Central region - Water balance slightly increased

Ongoing projects

- DriDANUBE – Drought risk in Danube region
- Lead partner – Slovenian Environment Agency

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