



The role and importance of Drought Management Centre for Southeastern Europe (DMCSEE) in drought monitoring in Montenegro

Prepared by: Mirjana Ivanov
Head of the Group of Applied Meteorology and Climate Change

WMO Webinar

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Main Activities in the Group of Applied Meteorology and Climate Change

- Agrometeorology:
 - Monitoring soil temperature
 - Agrometeorological analysis
 - Phenology
- Monitoring extreme events (e.g. drought, heavy rainfall that cause floods) and climate change
 - Activities in Climate open forums for Southeast and Mediterranean region (SEECOF and MEDCOF) related to seasonal forecast



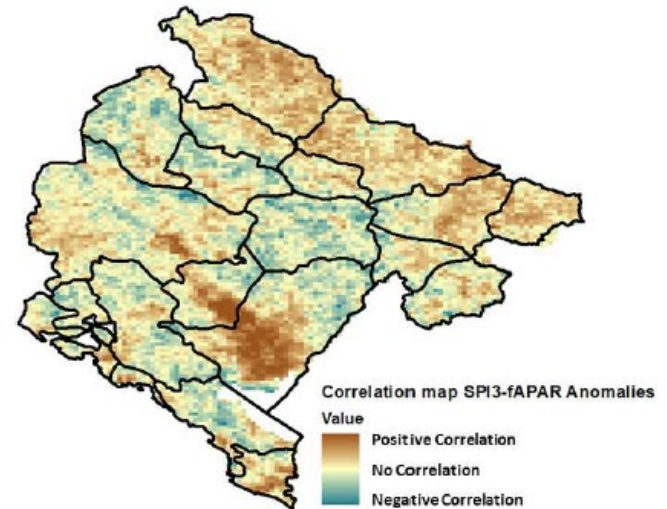
Drought monitoring status

■ Before the project IPA DMCSEE:

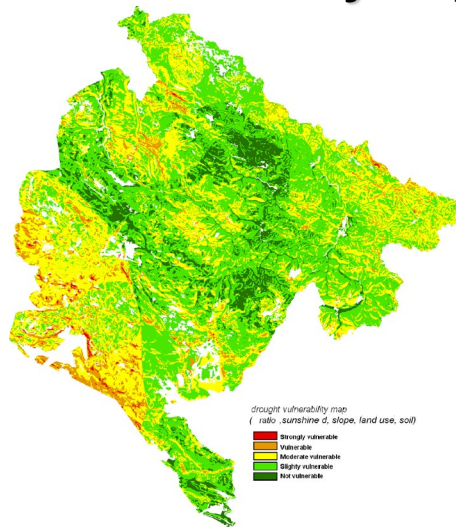
1. no permanent drought monitoring
2. sparse analysis of the drought

■ During and after the DMCSEE project

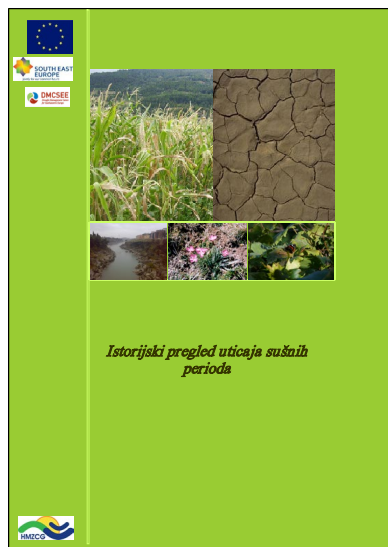
- Permanent drought monitoring based days
- Drought impact archive -created
- vulnerability – assessed
- Use of remote sensing data
- Study report – Drought monitoring with RS in Montenegro (GISMAP Simone Rossi, IHMS) – tested the potential of use of RS (FAPAR anomalies and SPI3) within EU DMCSEE project
- Training on use of WINISAREG software for irrigation scheduling
- Training in the DMCSEE regarding the RS:
 - in 2013 (drought hazard analysis and mapping, using LSA SAF products, Portugal) and in 2014 secondment of experts (RS by LAI and FVI) both within WMO project “*Building Resilience to Disasters in Western Balkan and Turkey*”



2. Vulnerability map

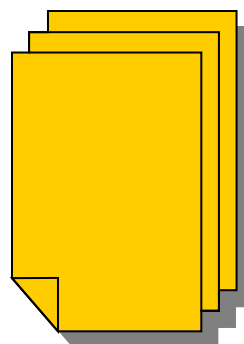


Studies



3. Reports:

homogenizaciji i interpolaciji



Impact Archive

Risk Assessment

Irrigation system (WINISAREG)

SPI day by day, SPI maps in GIS

Update of DriDanube drought impact database and yield data

No.	WHEN				WHERE			IMPACT DEFINITION				
	Year	Season	Month	Date_begin (YYYYMMDD)	Date_end (YYYYMMDD)	Country	NUTS 2 (1 event/1 or more nuts 2)	NUTS 3 (1 event/1 or more nuts 3)	Region	Impact categories (1 event/1 or more impacts)	Subcategories	Short description in English
1	2006	summer		20060701	20060801	Montenegro	CentralnRegion	Danilovgrad	central region	Wildfires		Forest fires in coastal region, Zeta-Bjelopavlici region and karstic region
2	2006	autumn		20061101	20061123	Montenegro	CentralnRegion	Nikišić	central region			Water deficit in the middle of Autumn affected Nikišić (karstic region). Restriction in water use
3	2006	autumn		20061128	20061128	Montenegro	SjevernRegion	Kolašin	northern region			Famous lake Biograsko Lake in Kolašin (northern mountainous region) was affected
4	2005	summer		20050620	20050621	Montenegro	CentralnRegion	Podgorica	central region	Wildfires	D1: Increased burned area	Forest fires affected grass and vegetation in vicinity of Podgorica town
5	2005	summer		20050629	20050629	Montenegro	PrimorskiRegion	Kotor	coastal region	Wildfires		Forest fires in vicinity of Kotor (coastal region)
6	2005	summer		20050715	20050715	Montenegro	CentralnRegion	Podgorica	central region	Wildfires	D1: Increased burned area	Forest fires affected grass and vegetation in vicinity of Podgorica town
7	2005	autumn		20050909	20050909	Montenegro	PrimorskiRegion	Herceg Novi	coastal region	Wildfires		Forest fires in vicinity of Herceg Novi (coastal region)
8	2003					Montenegro				Agriculture	A5: Reduced productivity of livestock farming (e.g., reduced yields or quality of milk, reduced stock weights)	Reduced purchase of milk
9	2003	summer		20030601	20030910	Montenegro	PrimorskiRegion	Bar	coastal region	Wildfires		Long Forest fires season in coastal, karstic and Zeta-Bjelopavlici region (Ulcinj, Bar, Budva, Tivat, Kotor, Cetinje, H.Novi, Nikišić, Danilovgrad)

TEMPLATE FOR YIELDS												
Crop e.g. Winter wheat	Region e.g. Plav	Yield, t/ha										
		1981	1982	1983	etc.							
Note: please, comment if you observed any special condition (extreme drought, floods, heatwaves etc.) which can influenced the yield in given year												
potato												
region	yield, t/ha	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bar		6	6	6.5	7	7	8	6	7	8	8	7
Ulcinj		3.5	4	40	40	40	40	30	40	40	40	40
Herceg Novi		15	30	30	14	14	14	14	14	14	14	14.1
Podgorica		8.36	8.36	8.2	8.56	8.79	8.98	8.9	9.1	9	9.2	9.3
Nikišić		10	20	12	10	19	15	11.9	16.9	17.9	15.9	18.5
Danilovgrad		10	25	15	10	9.5	9.75	7	7.5	20	11	
Pjeverlja		8.02	12.03	7	12	12.25	12.14	7	14.9	18	15	15
Berane		1.4	1.4	1.5	1.8	1.8	1.9	0.7	3	3.5	3.6	4.2
Bijelo Polje		6	8	18	17.5	18.02	24	20.9	22.1	25.8	26.9	29.9
Kolašin		10.21	12.72	9.16	7.92	9.08	7.4	8.2	8.6	7.4	9.3	
corn												
region	yield, t/ha	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Podgorica		5.08	5.31	4.99	5	5.04	5	5	5	5	5	5
Nikišić		2.5	4	3	3	2	6	4	7	7	7.2	7.5
Danilovgrad		3	8	6	8	8.5	8.7	6	6.5	7	5	4
Pjeverlja		1.7	1.7	1.6	1.25	1.2	1.2	0.5	1.3	1.5	1.5	1.7
Berane		1.4	1.4	1.5	1.8	1.8	1.9	0.7	3	3.5	3.6	4.2
Bijelo Polje		4.0	5.2	4.2	4.5	5.0	5.3	4.3	5.5	6.0	7.0	7.2
Kolašin		1.9	2.12	1.82	1.94	2.48	2.35	2.1	2.1	2.1	2.1	1.8
wheat												
region	yield t/ha	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Podgorica		2.9	3	2.5	3	3	3	3	3.1	3.1	3.1	2.5
Danilovgrad		2.4	3	3	3	3	3	3.5	4	3.6	3.8	3.4
olive												
region	total yeald (t)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bar		10	70	32	912	394	477	21	393	405	418	26
Ulcinj		43	42	26	284	105	147	90	480	98	500	60
Herceg Novi		245	245	406	407	407	407	337	407	343	343	414



DMCSEE – Drought Monitoring Centre for SEE

■ **Importance:**

- Plays a crucial role in strengthening regional resilience to drought. Its importance lies in several interconnected functions:.

■ **Regional Coordination:**

- DMCSEE harmonizes drought definitions, thresholds, and methodologies across countries in Southeastern Europe, ensuring **comparable data and assessments**.

■ **Monitoring & Early Warning**

- Provides **regional drought monitoring and analysis tools**, including indices like SPI and PaDI.

- Publishes monthly drought bulletins, offering timely updates for decision-makers and the public.

■ **Risk Assessment and Preparedness**

- Develops archives of historical drought impacts and vulnerability estimates, enabling **evidence-based risk assessments**.



DMCSEE – Drought Monitoring Centre for SEE



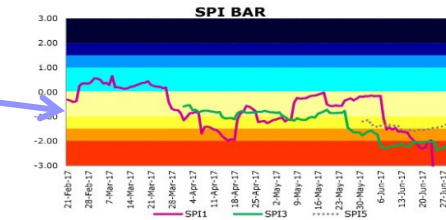
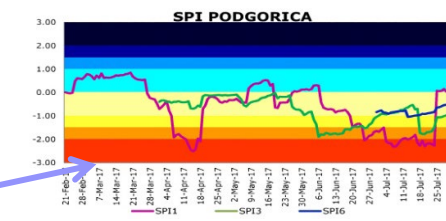
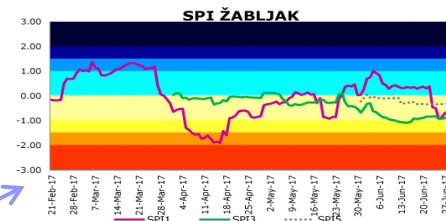
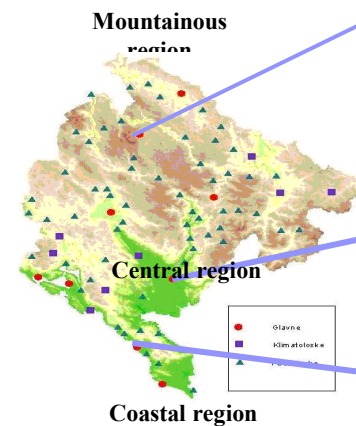
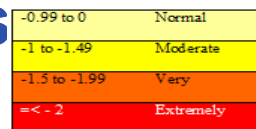
- **Capacity Building and Knowledge Exchange**
- Organizes training events, seminars, and workshops to build institutional capacity. Acts as a hub for sharing best practices, fostering collaboration among meteorological services, universities, and ministries.

- **Policy Alignment**
- Enhances implementation of **EU drought preparedness policies**, supporting national strategies.
- Raises awareness among stakeholders and policymakers about the importance of proactive drought management.



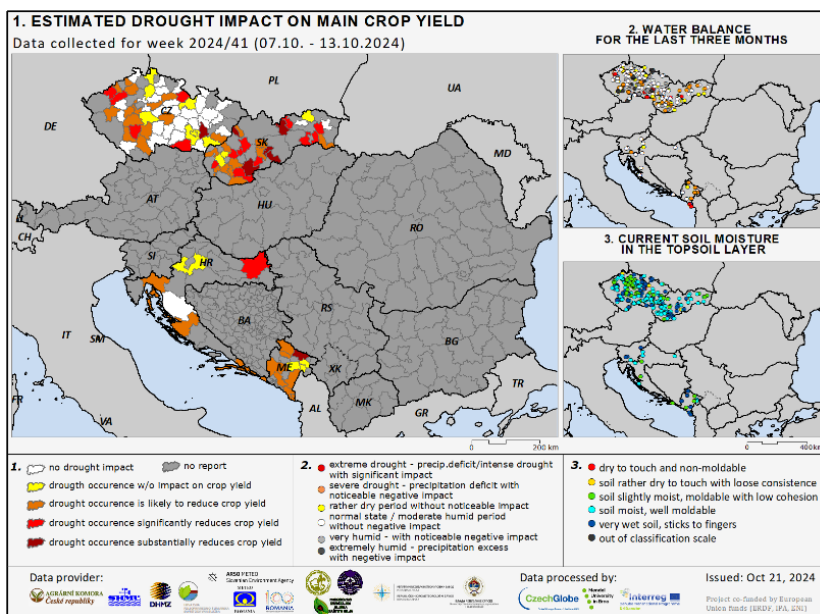
Drought monitoring products

- Daily and monthly SPI 1,2,3,6,9,12 (established within DMCSEE project)
- SPEI 3, 6, 12
- CDD, precipitation
- FVC with assistance of DMCSEE
- Drought watch tool (when it was possible) – regional established within DriDanube project
- National network of reporters

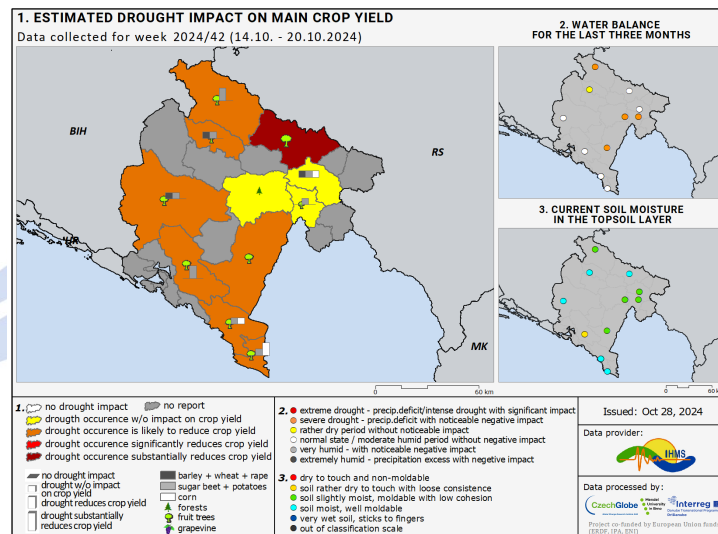


Drought monitoring products

■ Impact maps (with assistance of CzechGlobe and DMCSEE)



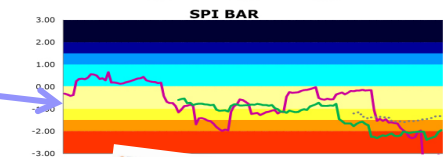
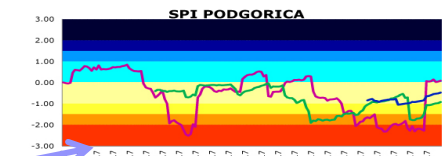
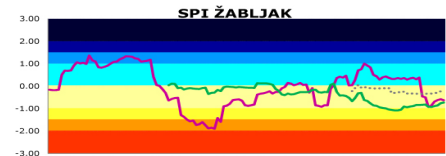
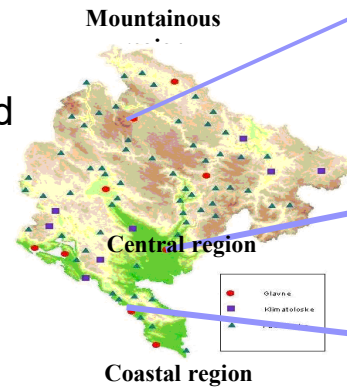
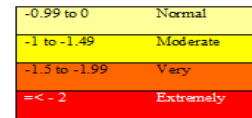
07.10-13.10.2024.



14.10-20.10.2024

Examples of Drought Monitoring (DMCSEE and DriDanube project)

- SPI 1,3,6,9, 12 and SPEI 3, 6, 12
- FVC indeks with support of DMCSEE
- EDO, <https://edo.jrc.ec.europa.eu/edov2/php/index.php?id=1000>;
- DroughtWatch user service was developed within IPA project DriDanube <http://www.droughtwatch.eu/>



SWI ASCAT Soil Water Index (SWI) anomalies.

SWB Surface water balance assessed with simulation using numerical weather prediction (NWP) model.

NDVI Normalized Difference Vegetation Index (NDVI) anomalies.

Vegetation Condition Relative vegetation condition based on MODIS sensor.

Estimated drought impacts on main crop yield based on national reporting networks.

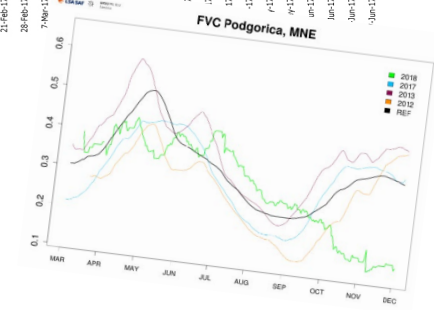
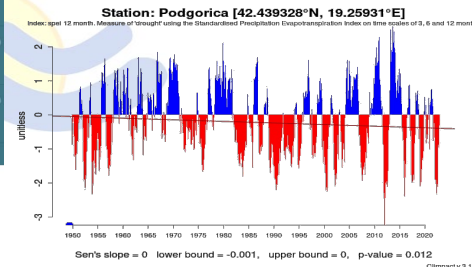
Yield prediction Yield prediction for most commonly cultivated crops on the level of NUTS2 regions.

GDATP2m 60-day Average Temperature Percentile at 2 m above ground level.

10DATP2m 10-day Average Temperature Percentile at 2 m above ground level.

HRS24 H-SAF 05:26-hour accumulated precipitation, @ EUMETSAT.

SLOVENIAN PRODUCTS



Network of national reporters

Zoran Pavicic, z.pavicic50@gmail.com

Ваша спецификација

Покопориједа

1. Како је стање влажности земљишта у слоју 20cm испод повр...

2. Како оцјенујете претходна 3 месеца према водном билансу?

3. Како оцјенујете прошлу недељу у односу на недељу која јој је претходила према водном билансу?

Overview of questionnaires results - localitie

Country	Region	Coordinates	Specification	Question 1	Question 2	Reporter
Montenegro	ME04 Bijelo Polje	43.043968, 19.735592	Fruits, viticulture and olives	3	-3	Vujadin Curovic danicurovic@cloud.com
Montenegro	ME12 Nikšić	42.816465, 18.63885	Agriculture	5	-2	Ljubomir Radojevic ljubomir.cg@gmail.com
Montenegro	ME12 Nikšić	42.816465, 18.63885	Agriculture	5	-2	Ljubomir Radojevic ljubomir.cg@gmail.com
Montenegro	ME01 Andrijevica	42.728178, 19.832647	Fruits, viticulture and olives	3	-2	Tomislav Kuc tomislav.kuc31@gmail.com
Montenegro	ME20 Ulogaj	41.935175, 19.20927	Agriculture	4	-3	Dejan Popovic popovicdejan@ig
Montenegro	ME20 Ulogaj	41.935175, 19.20927	Fruits, viticulture and olives	4	-3	Dejan Popovic popovicdejan@ig
Montenegro	ME14 Plevlje	43.379202, 19.241396	Agriculture	4	-2	Rade Malizan mbrvenica@gmail.co
Montenegro	ME02 Bar	42.091211, 19.128356	Agriculture	4	-3	Meho Perocevic mehoperovic198
Montenegro	ME02 Bar	42.091211, 19.128356	Fruits, viticulture and olives	4	-3	Meho Perocevic mehoperovic198
Montenegro	ME14 Plevlje	43.379202, 19.241396	Fruits, viticulture and olives	4	-2	Rade Malizan mbrvenica@gmail.co
Montenegro	ME06 Cetinje	42.402223, 18.91709	Agriculture	3	-2	Igor Raickovic igor.raickovic16@ms
Montenegro	ME06 Cetinje	42.402223, 18.91709	Fruits, viticulture and olives	3	-2	Igor Raickovic igor.raickovic16@ms
Montenegro	ME14 Plevlje	43.379202, 19.241396	Agriculture	4	-2	Vesilica Marusic vesilicamarusic@ms

1. ESTIMATED DROUGHT IMPACT ON MAIN CROP YIELD

Data collected for week 2024/39 (23.09. - 29.09.2024)

2. WATER BALANCE FOR THE LAST THREE MONTH

3. CURRENT SOIL MOISTURE IN THE TOPSOIL LAYER

Legend:

- no drought impact
- drought occurrence w/o impact on crop yield
- drought occurrence is likely to reduce crop yield
- drought occurrence significantly reduces crop yield
- drought occurrence substantially reduces crop yield
- extreme drought - prec.p.deficit/intense drought with significant impact
- severe drought - prec.p.deficit with noticeable negative impact
- rather dry period without noticeable impact
- normal state / moderate humid period without negative impact
- very humid - with noticeable negative impact
- extremely humid - precipitation excess with negative impact
- dry to touch and non-moldable
- soil rather dry to touch with loose consistence
- soil slightly moist, moldable with low cohesion
- soil moist, well moldable
- very wet soil, sticks to fingers
- out of classification scale

Aktivnosti na terenu

- Osnivanje i značaj mreže reportera -



(NPR Durmitor, februar 2018.)

Country	Region	Coordinates	Specialization	Question 1	Question 2	Reporter
Hungary	ME21 Zala	43.171622; 19.108192	Agriculture	4	1	Jozsef Páncsik: pancsik@magnum.hu
Hungary	ME14 Pula	43.372022; 19.241396	Agriculture	4	1	Rado Matcan: mtravica@gmail.com
Hungary	ME14 Pula	43.372022; 19.241396	Fruits, viticulture and olives	4	1	Rado Matcan: mtravica@gmail.com
Hungary	ME20 Iszba	42.748412; 19.617482	Agriculture	4	1	Budisava Kasalo: velenavac@magnum.hu
Hungary	ME20 Iszba	42.748412; 19.617482	Fruits, viticulture and olives	4	1	Budisava Kasalo: velenavac@magnum.hu
Hungary	ME02 Ise	42.105648; 19.389161	Agriculture	4	4	Orsolya Lajth: velenavac@magnum.hu
Hungary	ME02 Ise	42.105648; 19.389161	Fruits, viticulture and olives	4	4	Orsolya Lajth: velenavac@magnum.hu
Hungary	ME12 Naki	42.322225; 19.022222	Fruits, viticulture and olives	4	1	Lujtzer Katalin: lujtzer@magnum.hu
Hungary	ME12 Naki	42.322225; 19.022222	Agriculture	4	1	Lujtzer Katalin: lujtzer@magnum.hu
Hungary	ME20 Iszba	42.800714; 19.387022	Forestry	4	1	Vilma Horvath: mtravica@gmail.com
Hungary	ME21 Zala	43.112261; 19.142833	Forestry	4	1	Vilma Horvath: mtravica@gmail.com
Hungary	ME18 Pozsony	42.112711; 19.271482	Fruits, viticulture and olives	4	4	Vladko Mirovic: velenavac@magnum.hu
Hungary	ME18 Pozsony	42.112711; 19.271482	Fruits, viticulture and olives	4	4	Vladko Mirovic: velenavac@magnum.hu
Hungary	ME18 Pozsony	42.415819; 19.271604	Fruits, viticulture and olives	4	2	Bogdan Valovec: velenavac@magnum.hu

(Značaj mreže reportera, 2018.)

- Obuka i početak četvoromjesečnog monitoringa suše - primjeri



(primjer: AD Plantaže, maj 2018.)



(primjer: Nikšić – Velimlje, maj, 2018.)



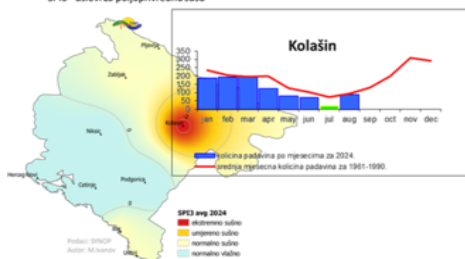
(primjer: Bar, maj 2018.)

Update of National Drought Bulletins and impacts

BILTEN ZA PRACENJE SUŠE Preliminarna analiza /AVGUST 2024.godine Odsjek za primijenjenu meteorologiju i klimatske promjene

Sažetak informacija: intenzitet i prostorna raspodjela srednjih mjesečnih vrijednosti SPI indeksa praćena je vrlo toplim i ekstremno toplim vremenom. Poljoprivredna suša se u **oblasti Kolašina** razvila u ekstremnu praćena deficitom padavina od aprila (slika ispod). U Kolašinu je bilo 15 tropskih dana tj. za 13 dana više u odnosu na klimatološku noramalu 1961-1990. (grafik ispod). Inače, maksimalni broj tropskih dana u Kolašinu je 17, a realizovan je sušne 2012. godine.

SPI3 - uslovi za poljoprivrednu sušu



Kolašin, avgust: odstupanje broja tropskih dana u odnosu na klimatološku normalu 1961-1990.



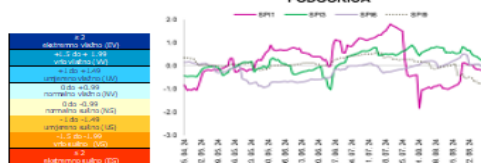
Hidrološka suša ima tendenciju daljeg razvoja u istočnim oblastima. U regionu primorja je u kategoriji „normalno sušno“, a u Ulcinju „umjereno sušno“ (predstavljeno na mapama ispod).

SPI9 i SPI12 - uslovi za hidrološku sušu



STANDARDIZOVANI INDEKS PADAVINA SPI (1,3,6,9) iz dana u dan: trajanje i intenzitet

PODGORICA

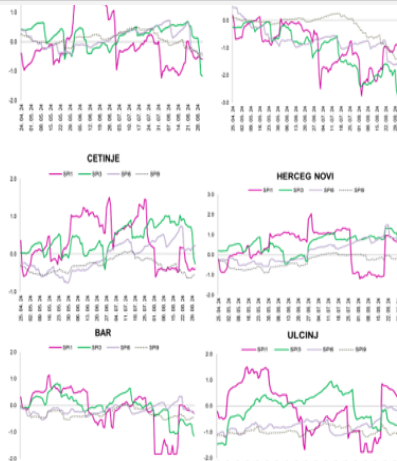


Na osnovu vrijednosti indeksa SPI 1,2,3,6,9,12 (graf.SPI/avgust '24.), koje su u velikoj mjeri u korelaciji sa zalihama produktivne vlage u zemljištu i nivoima površinskih i podzemnih voda, data je ocjena preovlađujućih **uslova vlažnosti** i procjena uticaja na poljoprivredne kulture (vegetaciju) i hidrološke prilike po regionima tokom posmatranog mjeseca i predstavljena tabelarno.

gallu Coza Gore

Avgust/2024.god.					
Autor: T.Šuš					
SPI3	Poljoprivredna suša	SPI6	SPI9	SPI12	Hidrološka suša

Plovlja	NS	Deficit padavina	NS	NS↑	Neostatak vlage u tlu u daljem pogoršanju-uslovi za razvoj poljoprivredne suše	NS	NS↑	NV↑	tendencija razvoja hidrološke suše
Zabljak	NV	Deficit padavina	NS	NS↑	Neostatak vlage u tlu u daljem pogoršanju-uslovi za razvoj poljoprivredne suše	NS↑	NS↑	NV	tendencija razvoja hidrološke suše (manjena vodostajnost izvora)
Kolašin	ES	izazvan deficit padavina	ES	ES	Veoma neostatak vlage u tlu-poljoprivredna suša	NS↑	NS↑	NS↑	hidrološka suša u razvoju
Central.r.									
Podgorica	NS↑	Deficit padavina	NV↑	NV↑	Pogoršanje sadržaja vlage u površinskim slojevima tla-trajanje su biljke sa glijem korištenom	NV↑	NS↑	NV↑	tendencija razvoja hidrološke suše krajem mjeseca
Nišić	NS↑	izazvan deficit padavina	NS↑	NV	Pogoršanje sadržaja vlage u tlu-trajanje su biljke sa glijem korištenom	NV↑	NS↑	NV↑	nizak nivo razdernih voda
Četinja	NS↑	izazvan deficit padavina	NV↑	NV↑	Pogoršanje sadržaja vlage u površinskim slojevima tla-trajanje su biljke sa glijem korištenom	NV	NS↑	NS↑	nizak nivo razdernih voda-tendencija razvoja hidrološke suše
Jadrin.r.									



Example of drought bulletin in September, 2022

BILTEN ZA PRAĆENJE SUŠE
PRELIMINARNA ANALIZA /septembar 2022.godine

IZGLEDI

Prema simulaciji modela* za 60-dnevne akumulirane anomalije površinskih padavina do 6. novembra (slika 1) prognoza se da će ući dio Crne Gore i, vrlo malim iznosom. To znači da se očekuje da će 60-dnevne akumulirane bilansa biti znatno smanjene u odnosu na normalne vrijednosti za jesen.



Slika 1. 60-dnevne akumulirane anomalije površinskih padavina, u novembra prema modelu korišćenom u slatki za praćenje suše.

STANDARDIZOVANI INDEKS SPI

SPI 3 analize akumuliranih padavina toki

Sijevni region:

* <https://www.droughtwatch.eu/>

BAR: Višemjesečna poljoprivredna vruća je nastavila da je umjerenom do vrlo sušom. Od druge dekade trajaju vlažni SPI1 i SPI3 su bile pozitivne, ali je do srednje polovine je SPI3 opet negativno imao vrijednosti >0 (do -0,76) -

SOUTH EAST EUROPE
policy for our common future

DMCSEE
Danube Management Centre
for Sustainable Europe



Surface water balance anomaly patterns remained similar to the previous month. The left figure shows the anomaly of the water balance in the time period 10 July - 17 September 2011. Water deficit increased in some parts of the Balkans and reached values around -200 mm of deficit. In the rest of DMCSEE region, there are still relatively favorable water conditions.

ANALIZA UTK

Tokom septembra su uticaji i posljedice suše na prvo osnovu praćenja suše, analize SPI indeksa, moćno se reči prekinuta u svim krajevima Crne Gore. Ukupna količina prosječna, sadržaj vlage u zemljištu je znatno povećan i...

Predlog: ovaj dio bih mogla ja, ali ako želi neko od vas,

ANALIZA UTK



Foto: Stano Jureta (Ljetošće jezero za potrebe HE Đurđica, izvor: Mirjana Ivanov, 06.09.2022.)

Foto: Ulika Đorđić (Podgorica, kod mosta Milevojine ulaz, Mirjana Ivanov, 13.09.2022.)

SPI Index

SPI Aug 2011 (1 month)
GPCP (first-guess analysis)



SPI index with one-month accumulation period for August 2011 shows that situation has deteriorated during this month. Large part of the DMCSEE area (mainly western Balkan) show widespread dry situation. However, dry period was short; already 3-month SPI shows better conditions. Only small, isolated patches of negative SPI).

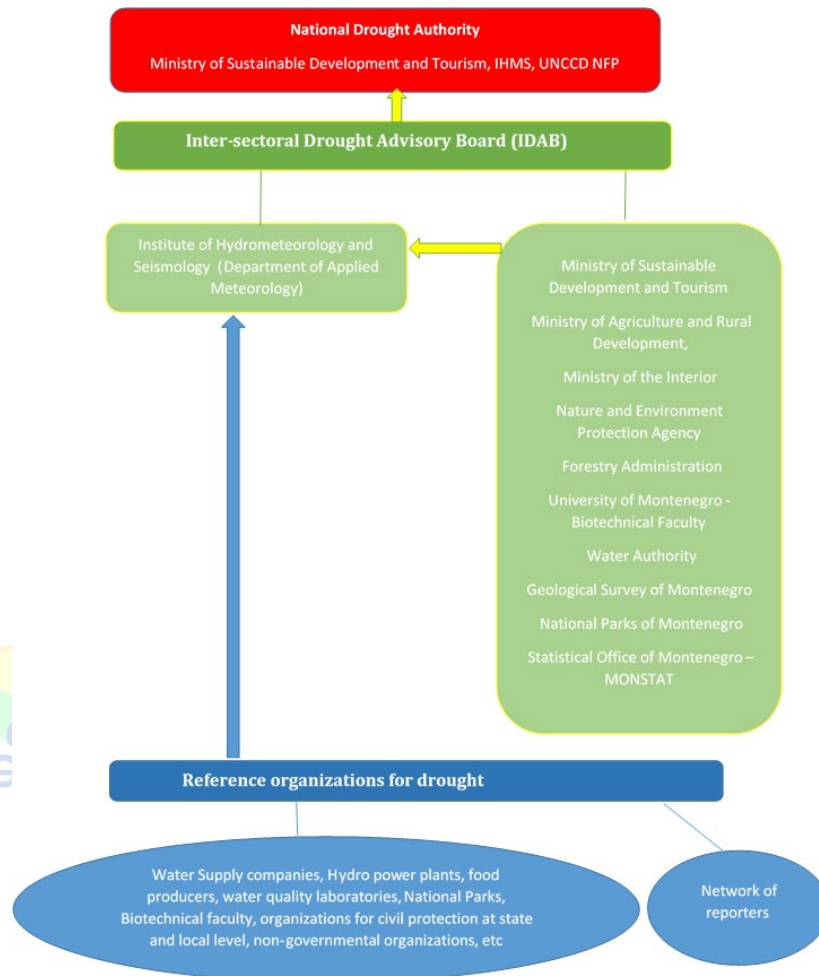
Impact reports



Fraction of Vegetation Cover anomaly (FVC - computed from available archive of EUMETSAT's LANDSAT database) shows some anomaly in vegetation status in comparison with past five years. Most notably vegetation cover is less intense in NW part of the region (Slovenia and NW

RECENT DROUGHT RELATED PROJECTS

- **Montenegro Drought Management Plan, 2020 includes:**
 1. **National Drought Authority (NDA) – to be established**
- **Danube Drought Strategy as a basis (INTERREG DriDanube)**
- 2. **Maintain national network of reporters**



INTERREG TRANSFER Danube project

- Pilot Area location, Phenological db and soil sampling

Interreg
Danube Region



Co-funded by
the European Union

TRANSFER Danube

- Berane – Vinicka
- Nikšić – Mali Brezovik
- Danilovgrad – Kosic



Slika 1. Berane – Vinicka



Slika 2. Danilovgrad – Kosic



Message	Message	Message	Message	Message
(Shared part of Messages)	(Shared part of Messages)	(Shared part of Messages)	(Shared part of Messages)	(Shared part of Messages)
10.07.2023	10.07.2023	10.07.2023	10.07.2023	10.07.2023
11.07.2023	11.07.2023	11.07.2023	11.07.2023	11.07.2023
12.07.2023	12.07.2023	12.07.2023	12.07.2023	12.07.2023
13.07.2023	13.07.2023	13.07.2023	13.07.2023	13.07.2023
14.07.2023	14.07.2023	14.07.2023	14.07.2023	14.07.2023
15.07.2023	15.07.2023	15.07.2023	15.07.2023	15.07.2023
16.07.2023	16.07.2023	16.07.2023	16.07.2023	16.07.2023
17.07.2023	17.07.2023	17.07.2023	17.07.2023	17.07.2023
18.07.2023	18.07.2023	18.07.2023	18.07.2023	18.07.2023
19.07.2023	19.07.2023	19.07.2023	19.07.2023	19.07.2023
20.07.2023	20.07.2023	20.07.2023	20.07.2023	20.07.2023
21.07.2023	21.07.2023	21.07.2023	21.07.2023	21.07.2023
22.07.2023	22.07.2023	22.07.2023	22.07.2023	22.07.2023
23.07.2023	23.07.2023	23.07.2023	23.07.2023	23.07.2023
24.07.2023	24.07.2023	24.07.2023	24.07.2023	24.07.2023
25.07.2023	25.07.2023	25.07.2023	25.07.2023	25.07.2023
26.07.2023	26.07.2023	26.07.2023	26.07.2023	26.07.2023
27.07.2023	27.07.2023	27.07.2023	27.07.2023	27.07.2023
28.07.2023	28.07.2023	28.07.2023	28.07.2023	28.07.2023
29.07.2023	29.07.2023	29.07.2023	29.07.2023	29.07.2023
30.07.2023	30.07.2023	30.07.2023	30.07.2023	30.07.2023
31.07.2023	31.07.2023	31.07.2023	31.07.2023	31.07.2023

Partner Name	Country	Pilot Area Name	Contact Person	E-mail	Crops	Latitude (centre)	Longitude (centre)	Area (ha)	Admin Unit (Municipality)
8 IWS (PP4)	Germany	Pilot Area Haarbach	Teresa Schnellbach	teresa.schnellbach@iws.uni-stuttgart.de	Winter Wheat	1. 48.4096 2. 48.5082	1. 13.1182 2. 13.1086	1. -3,5 ha 2. -14,2 ha	State: Bavaria Admin. region: Niedert District: Pfaffau Municipality: 94542 Ha
9 IHMS (PP10)	Montenegro	Berane (Vinicka)	Natasa Pazin	natasa.pazin@meteo.co.me	Maize	42.809409	19.844952	0.53 ha	Berane, Northern Regi
10 IHMS (PP10)	Montenegro	Nikšić (Mali Brezovik)	Natasa Pazin	natasa.pazin@meteo.co.me	Maize	42.839	18.9258	1 ha	Nikšić, Central Region
11 IHMS (PP10)	Montenegro	Danilovgrad (Kosic)	Natasa Pazin	natasa.pazin@meteo.co.me	Maize	42.5318	19.1542	2 ha	Danilovgrad, Central R
12 BOKU	Austria	Tullnerfeld	Roland Koeck	roland.koeck@boku.ac.at	Maize	48.331170 N	16.051790 E	90,000 ha	Tulln - Lower Austria -



Slika 4. Uzorkovanje zemljišta (Berane – Vinicka)



Slika 5. Uzorkovanje zemljišta (Danilovgrad)



Slika 6. Uzorkovanje zemljišta (Nikšić – Mali Brezovik)



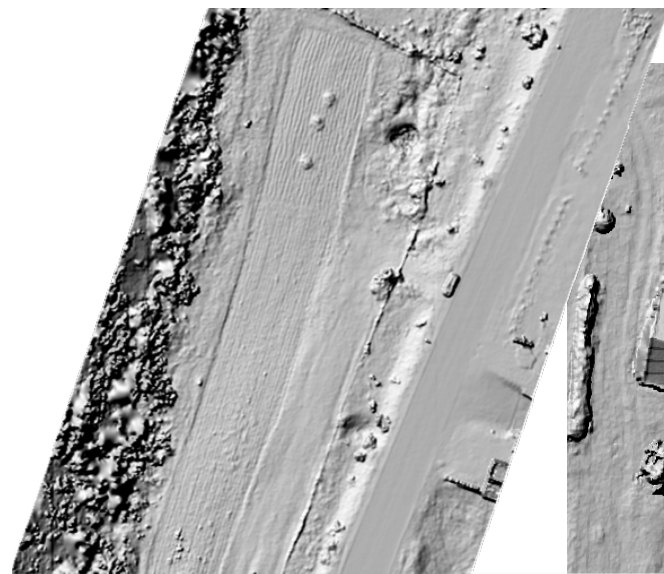
Drugi period oktobar 2025 - mart 2026.



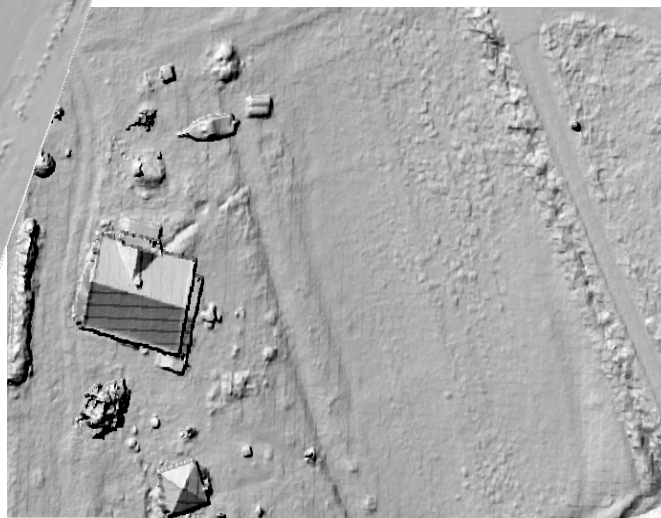
- Odabir i nabavka instrumenta (Irrometar 60cm SR) za praćenje vlažnosti tla na pilot oblastima - priprema za njegovo postavljanje i obuku farmera za dekadno izvještavanje od marta/aprila 2026.



- Prvo snimanje pilot oblasti dronom nakon jake kiše / januar 2026.
CILJ: dobijanje DEM-a (digitalnog modela reljefa) visoke rezolucije za modeliranje erozivnih procesa, simuliranje vodnog bilansa i procjene rizika od suša i poplava



Berane-Vinicka



Danilovgrad-Kosić



Nikšić - M. Brezovik

Drugi period oktobar 2025 - mart 2026.

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Station Name	Synop	Latitude	Longitude	Altitude	Date	Maximum Air Temperature (°C)	Minimum Air Temperature (°C)	Relative Humidity (%)	Wind Speed at 2 m (m/s)	Sunshine Duration (hours)	Precipitation (mm)
Berane	13467	19.883	42.85	691	2025/	7	4.6	90	0	0	3.4
Berane	13467	19.883	42.85	691	2025/	12.9	5	84	0	0.3	32.9
Berane	13467	19.883	42.85	691	2025/	13	4.7	84	0	3.9	4.5
Berane	13467	19.883	42.85	691	2025/	11.4	6	88	0	0	2.6
Berane	13467	19.883	42.85	691	2025/	17.6	5.5	71	0.7	8	5.1
Berane	13467	19.883	42.85	691	2025/	10	-1.6	92	0.3	1	4.3
Berane	13467	19.883	42.85	691	2025/	4	-2.5	77	0.7	2.8	6.2
Berane	13467	19.883	42.85	691	2025/	5.2	-6.2	72	1	3.3	0.2
Berane	13467	19.883	42.85	691	2025/	12.4	-3.1	71	0	8.8	0
Berane	13467	19.883	42.85	691	2025/	12.4	1	74	0	3.6	0
Berane	13467	19.883	42.85	691	2025/	18.6	1.8	61	0.7	10.9	1.2
Berane	13467	19.883	42.85	691	2025/	18.6	7	62	0.3	7.3	0
Berane	13467	19.883	42.85	691	2025/	20.4	-0.3	65	0.7	6.2	0
Berane	13467	19.883	42.85	691	2025/	15.2	10	67	0.7	1.3	0
Berane	13467	19.883	42.85	691	2025/	20.6	11.6	50	2.3	5.3	0
Berane	13467	19.883	42.85	691	2025/	26.1	8	51	1.7	7.7	0
Berane	13467	19.883	42.85	691	2025/	26	7.2	70	1	3.6	0
Berane	13467	19.883	42.85	691	2025/	19.6	9	69	0.7	7.1	12
Berane	13467	19.883	42.85	691	2025/	22	1.2	70	0	11.7	0
Berane	13467	19.883	42.85	691	2025/	24.8	4	61	0	10.1	0
Berane	13467	19.883	42.85	691	2025/	26	4.3	69	0	8.9	0
Berane	13467	19.883	42.85	691	2025/	24.7	8.8	70	2.3	9	3.8

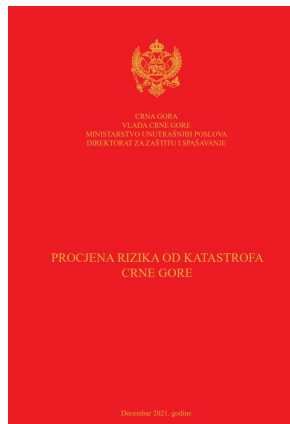
- Priprema meteoroloških podataka istorijskih (od 2000. god.) i dnevnih (Tmax, Tmin, padavine i intenziteti, osunčavanje, rel. vlažnost vazduha, brzina vjetera na visini 2m) za projekcije i agroklimatske analize.
- Organizovanje prvog nacionalnog seminara (4.mart 2026.)



Recent projects

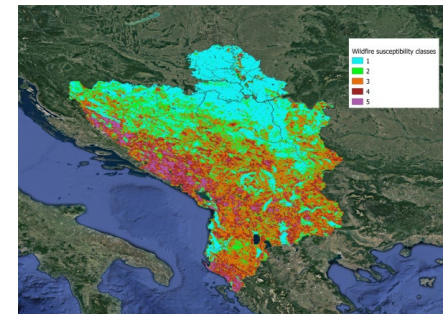
- **National risk assessment of catastrophe in Montenegro, 2021:**

Risk assessment of extreme weather and climate events



IPAFF projekat:

Application of tool for analysis and risk assessment of forest fires, 2023.



FAO PROJECT, 2024 – Part about vulnerability and impact assessment



- Thursday, 30.06.2022 FAO organized:
- **Presentation of Comprehensive Analysis of the Disaster Risk Reduction, Early Warning Systems and Agro-meteorology Services for the Agriculture in Montenegro, where experts from IHMS presented work within DriDanube project.**



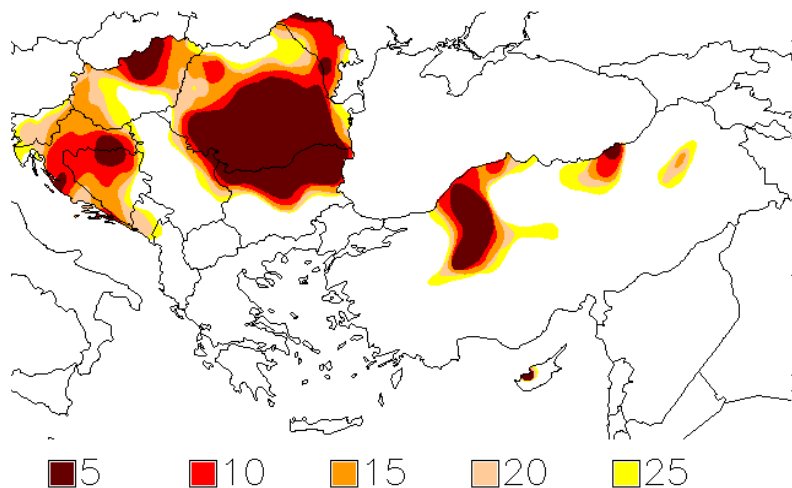
Comprehensive analysis of the disaster risk reduction, early warning systems and agro-meteorology services for agriculture in Montenegro

Support to the assessment of Disaster Risk Reduction in agricultural sector in the Western Balkans
(TCP/RER/3806/C1)

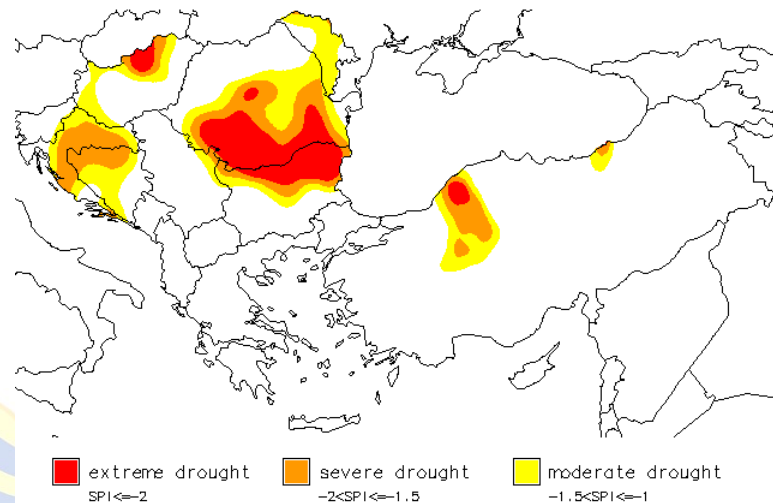
Food and Agriculture Organization of the United Nations
Podgorica, 2021

Primjer: mapa SPI indeksa i padavina (septembar 2011)

Precipitation percentiles Sep 2011
GPCC first-guess analysis



SPI Sep 2011 (1 month)
GPCC first-guess analysis



Contacts:

mirjana.ivanov@meteo.co.me

miras.drljevic@meteo.co.me

natasa.pazin@meteo.co.me

tonka.popovic@meteo.co.me



www.hmz.gov.me;
office@meteo.co.me

***THANK YOU
FOR ATTENTION***

