



- Country Report  
- Bosnia and Herzegovina

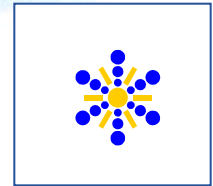
- Drought conditions and management strategies
  - in Bosnia and Herzegovina

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- Initiative on „Capacity Development to support National Drought Management Policy 9-11 July 2013, Bucharest“

# Situation of drought as seen through the soil water budgeting in B&H



Hidrological parametar	B&H average	South area	Central area	North area
Precipitation(O)	1200	2000	1000	800
Potential ET-PET	725	900	650	700
Real ET-RET	600	600	600	600
Water deficit (M)	125	300	50	100
Water surplus (V)	600	1400	400	200
Drought coefficient P/PET	1.65	2.22	1.54	1.14
Outflow coefficient S/P	0.50	0.70	0.40	0.20

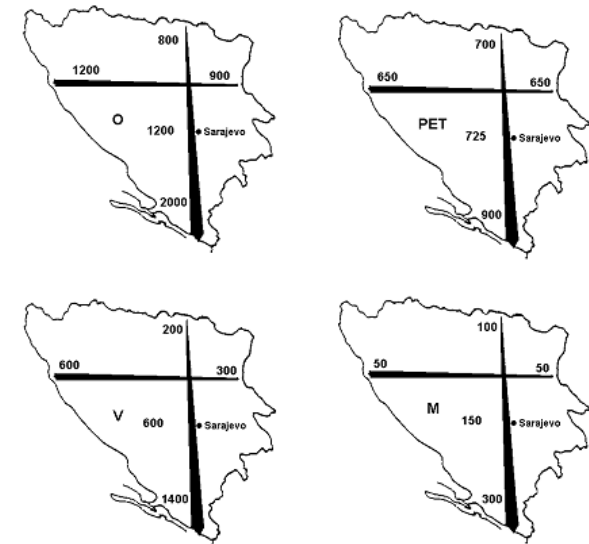


Table 1. Main components of the water balance (in mm):

- Scheme of spatial distribution of average annual precipitation (O) potential evapotranspiration (PET), surplus (V) and soil water deficiencies (M) in Bosnia and Herzegovina



# Extreme weather events during several years..

- In August 2000 worst drought in 120 years;
  - “In summer 2003. godine more communities in B&H was hit by fourmonth drought
  - In summer 2007. Extreme high temperatures and drought
  - In 2012 prolonged drought period
  -
- From 2000. in BiH is registred:
  - 5 dryer year(2000,2003,2007,2011,2012)
  - 4 year with great floods
  - Last 4 year (2009-2012) were characteristic by extreme events:
  - 2009 - floods
  - 2010 - floods
  - 2011 - drought and high temperatures
  - 2012 - cold wave,drought, and high temperature

# Roles and responsibilities of the HMS's in Bosnia and Herzegovina related to drought

*Federal Hydrometeorological  
Intitute Sarajevo*

*Republic hydrometeorological  
service of RS, Banja luka*

*Roles of HMSs in B&H includes:*

- systematic observation and monitoring of hydrometeorological parameters;
- publishing, and providing information, forecasts, products and services related to the weather, climate and water, as well as their application in the human activities that are under the influence of atmospheric and related phenomena.





- Provision of quality-assured historical and real-time hazard data;
- The derivation of drought-relevant parameters, indices and indicators.
- Concerning drought analysis, there is great number of drought indices in operational use.
- HMS's uses the following agroclimatic drought indices: Standardized precipitation index (SPI), Palmer drought severity index (PDSI), De-Martonne aridity index, Seljaninov's index; Precipitation quantity expressed in the percentage of long-term average for month, season and vegetation period, effective precipitation, Precipitation quantity expressed in the percentage of long-term average for month, season and vegetation period.

# Drought indices



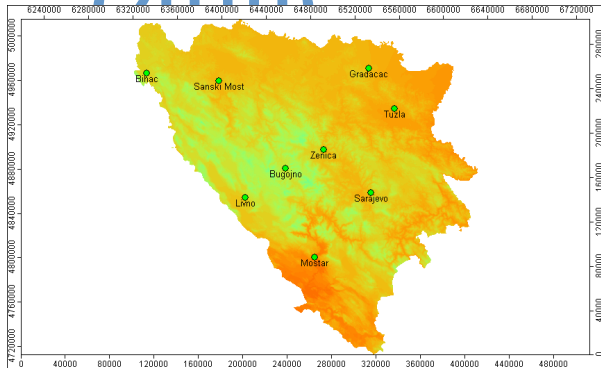
- Regarding droughts, HMS's analyzes extreme weather conditions and produces drought maps, depending on user requirements, or for specific projects. Drought maps is based on calculations of SPI (Standardized Precipitation Index) on monthly basis.

Departments of Agrometeorology prepare analysis and calculate drought agro-climatic indices and provide weekly agro-meteorological forecasts and warnings for the needs of farmers and other users.

Operational meteorological products provided by HMS's are mainly disseminated through regularly issued bulletins such as daily forecasts and informations on special events and warnings.

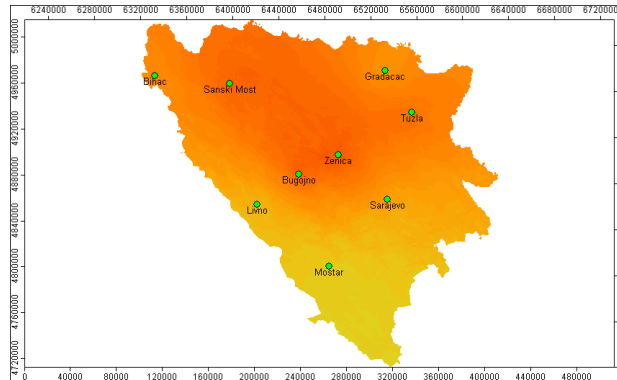


# Product of SPI - Drought monitoring in Federation of Bosnia and Herzegovina (2010)



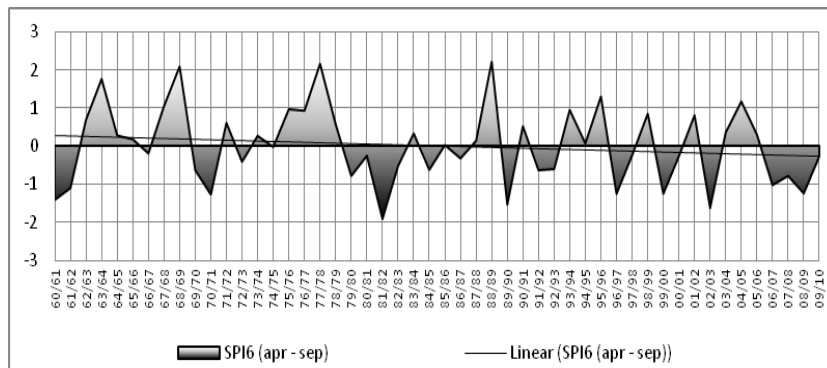
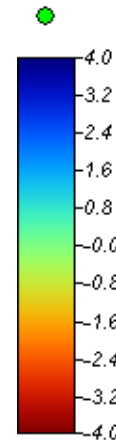
• SPI 1

April 2011

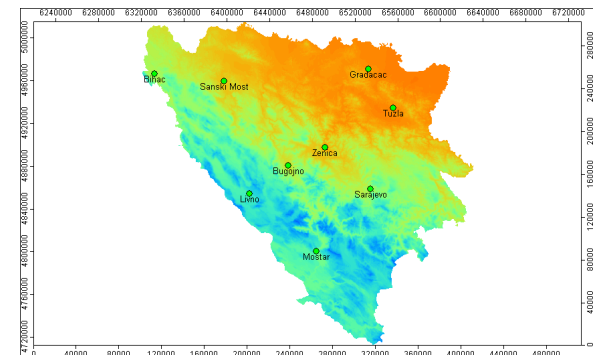


• SPI2

Stanice



• Figure 1: SPI2 for Sarajevo, period 1961 - 2010



• SPI6



## Disemination data

- Main users include: Governments and Ministries for Agriculture, Water Management, Forestry, scientific institutions, Agricultural intitute
- Civil Protection, Ministry of Security , Operations center 112,
- Transportation
- Energy
- Recreation and tourism
- Environment/ecosystems
- Health



# Vulnerability assessment



- Agricultural ,forestry and fisheries sector in BiH is high vulnerable to drought, because of lack of modern technologies,- policies of strategies aiming to strengthen agriculture resilience to drought and also because of effective Early Warning System.
- In the last 10 years there has been considerable recognition by Government of the need to develop drought preparedness plans and policies to reduce the impacts of drought.
- Unfortunately progress in drought preparedness is slow because lack of institutional capacity and human and financial resources necessary to develop comprehensive drought plan and policies.
- The environment
- Sectors relying on surface water (i.e. reservoirs and lakes) and subsurface water (i.e. groundwater) are usually the last affected
- Vulnerable groups of the society: small farmers, young, women .Social impacts mainly involve public safety, health, conflicts between water users, reduced quality of life.
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## Emergency relief and drought response

- Governmental organizations have responded by providing relief to those most affected.

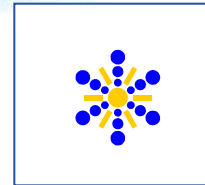
Under the Article 10 of the provision of the UNCCD, Bosnia and Herzegovina is preparing **National Action Programmes (NAPs)**

- To identify the factors and measures necessary to combating desertification and land degradation, and mitigate the effects of drought.
- In this framework, NAP's should enhance national climatological, meteorological and hydrological capabilities and the means to provide a drought early warning system.
- This includes strengthening drought preparedness and management at local, sub-regional, regional, entity and national levels and incorporating long-term strategies to mitigate the effects of drought, in line with national policies for sustainable development

# Practices to alleviate drought impacts



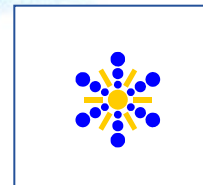
- to determine the scientific, operational and institutional capacity that exists at the national and entity levels.
- Institution will provide leadership for the identification of specialized seminars, workshops, and conferences to build institutional capacity in the country on a risk-based approach for drought management.
- Drought expert from Federal Hydrometeorological Institute in Sarajevo was seconded to DMCSEE in the framework of the Regional Programme in Disaster Risk Reduction in South Eastern Europe.
- more training in drought vulnerability assessment and remote sensing techniques for drought monitoring management, mitigation strategies, planning and policy.
- Training activities for end users
- The development of decision-support tools must be viewed as an end-to-end-to end process, incorporating user needs, expectations, and feedback at all stages.



# Needs

- To establish drought early warning systems on national level;
- To upgrade and modernize the hydro-meteorological observation network, data management and forecasting system and to provide sustainable organisational, human and technical resources to maintain and operate it;
- To train drought vulnerability and risk assessment;
- To clarify the mandates and communication routes for alerts, advisories, warnings and alarms from state level to different levels
- To enhance cooperation and networking between hydro-meteorological sector and different stakeholders and end-users of hydromet data, services and early warnings;
- To strengthen against drought preparedness and management strategies including contingency plans at local, entity and national level;
- To develop sustainable irrigation systems, etc.

# Consequences of drought in B&H, 2012



•Forest fires in Boracko jezero, 2012



Thank you for your attention

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