



RSrpska, Bosnia and Herzegovina

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## Assessment of Predicted DJF-17 season over The Republika Srpska, Bosnia and Herzegovina

### 1. SEECOF-17, MedCOF-7 Climate outlook for the 2017 winter season:

#### *Temperature and Precipitation*

Over the Republika Srpska and Bosnia and Herzegovina it is expected to be around normal mean temperature (with 30, 40, 30%) or above normal (20,30,50 %) in the southern.

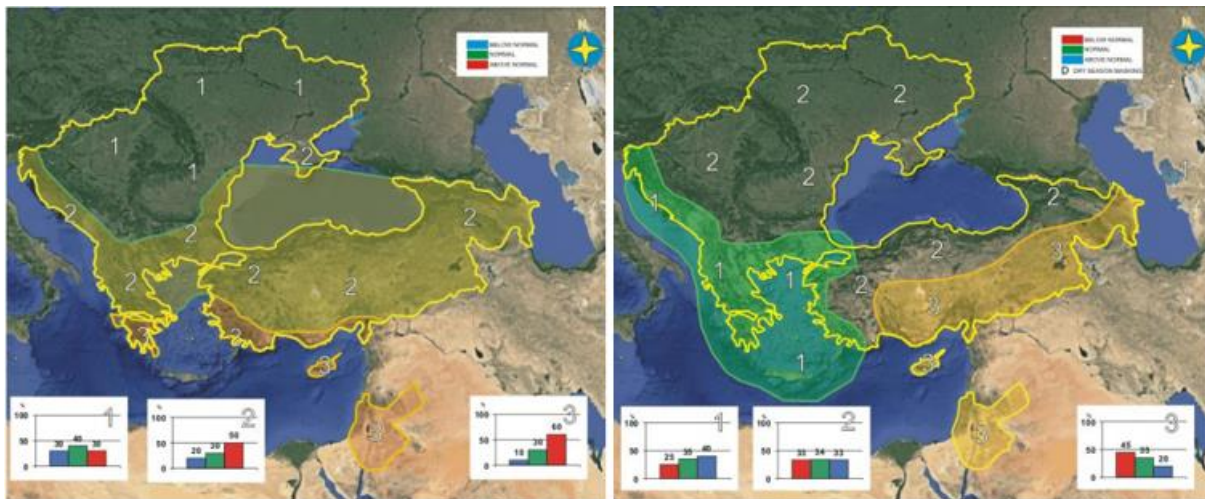


Figure1: Temp (left) and PRC tot (right) DJF17 Outlook

For the precipitation regime over the most of the territory there was no clear signal (33, 34, 33 – the portion 2) and for the south area was predicted wetter condition (25, 35, 40 % - the portion 1) .

***The most stations over The Republika Srpska registered temperature and precipitation belong to below lower tercile category.***

*The last season was the 17<sup>th</sup> coldest 'climatological' winters on record. From fifteen coldest winter season form 1962 to ppresent, seven belong to period after 2000. Year; from fifteen warmest ones, eight belong to this century. This is to show that warm winters are not much frequent due to climate fluktuations (changes).*

*Tmean ranged from -3,04°C in Han Pijesak to 5,3°C in Trebinje, precip total from 73mm (Srbac) to 284mm (Chemerno). Weather condition was very cold or extremely cold, according to Tmen percentile*

# 1. Analysis of the 2017 Winter season (December to February):

## Air temperature

-December:

Tmean: ranged from -2,7 °C (Sokolac) to +5,8 °C (Trebinje), Banja Luka 0,4 °C; TXx: from 9,8 (Srebrenica) to 17,7 (Ribnik), Banja Luka 14,1 °C; TNn: from -17,4 (Sokolac) to -1,6 (Trebinje), Banja Luka -8,9 °C.

-January:

Tmean: ranged from -8,0 °C (Sokolac) to +2,2 °C (Trebinje), Banja Luka -3,6 °C; TXx: from 5,5 (Kalinovik) to 15,6 (Banja Luka); TNn: from -29,6 (Sokolac) to -9,6 (Trebinje), Banja Luka -17,5 °C.

-February:

Tmean: ranged from 0,7 °C (Chemerno) to +8,4 °C (Trebinje), Banja Luka 5,5 °C; TXx: from 9,8 (Chemerno) to 23,2 (Bijeljina); TNn: from -14,4 (Sokolac) to -0,8 (Trebinje), Banja Luka -4,8 °C.

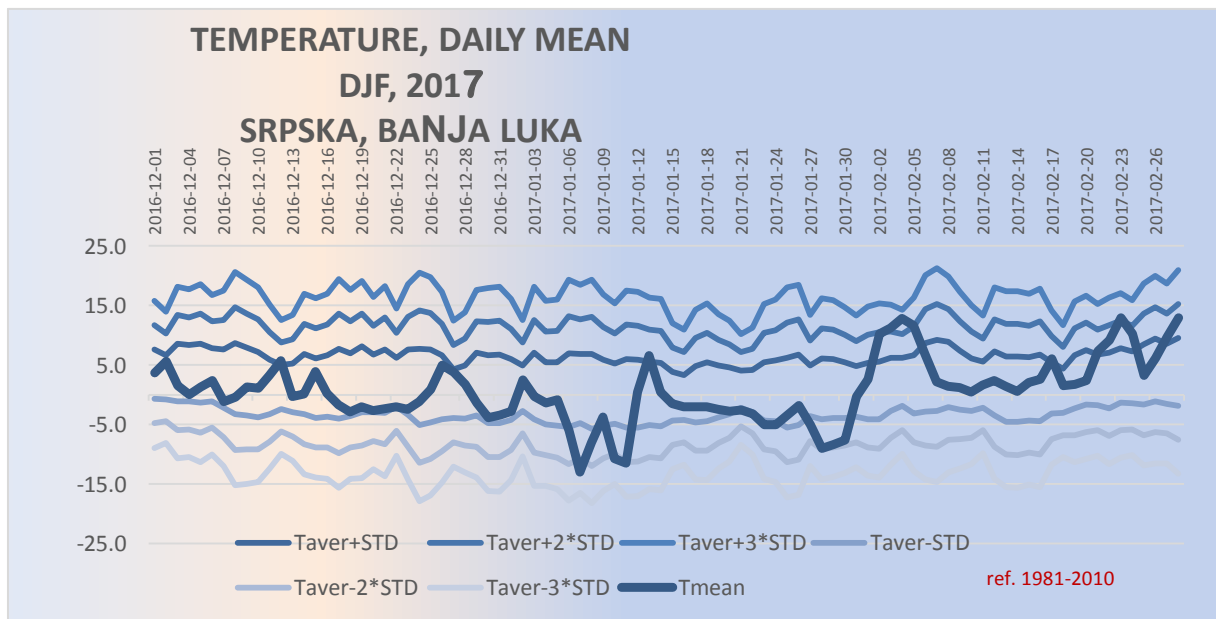


Figure 2: The DJF 2016 Temp, daily mean (°C) compared to  $T_{mean81-10} \pm STDs$  for Banja L., The Rsrpska

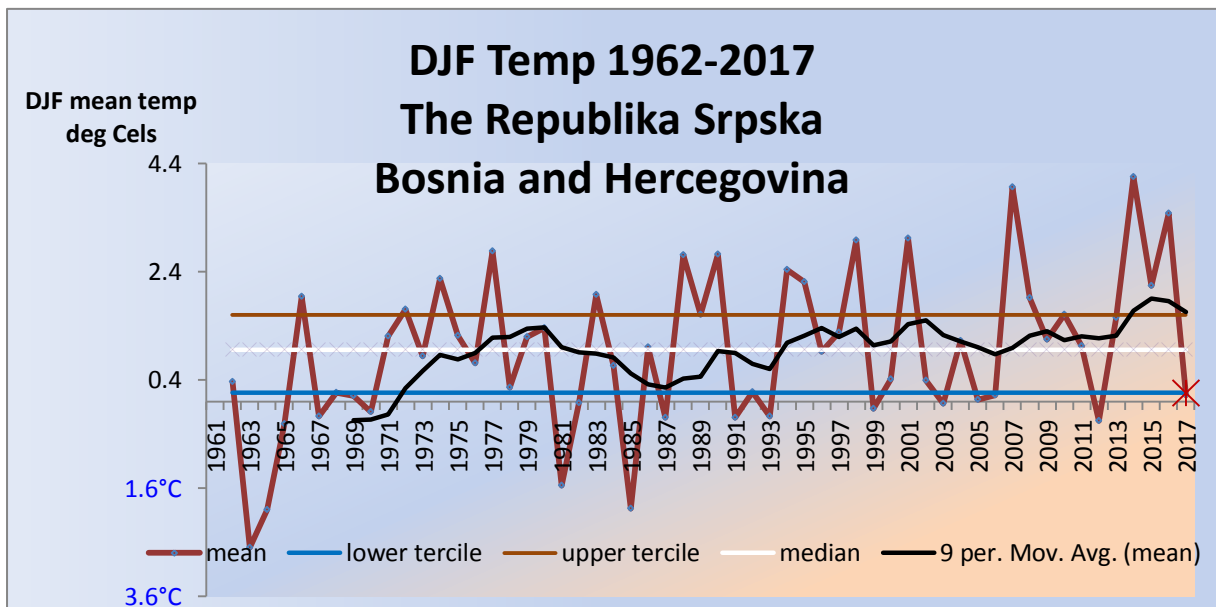


Figure 3: The DJF Tmean averaged over stations of R.Srpska from 1962 to 2017

DJF mean temperature were below normal over the most station in Srpska or near normal (Banja Luka, Novi Grad, Sokolac, Drinic) what is shown at the table 1. Around normal heat weather condition is predicted with highest 40% probability, that is partially accurate.

Table 1. DJF-2017 mean temp statistics for the station over The Republika Srpska (ref 1981-2010)

Station	z (SPI)	NORMSDIST (z) (percentile)	PercRank	djfl7 °C	djfl7anom °C	33,33	50,00	66,67	tercile anom. categ
Бања Лука Banja Luka	-0,42	0,34	0,37	0,8	-0,7	0,6	1,3	2,2	near norm
Приједор Prijevor	-0,70	0,24	0,26	0,3	-1,1	0,5	0,8	2,1	below
Нови Град Novi Grad	-0,41	0,34	0,34	0,5	-0,7	0,5	1,1	1,9	near norm
Добој Doboj	-0,75	0,23	0,20	0,2	-1,2	0,7	1,0	2,2	below
Бијељина Bijeljina	-0,70	0,24	0,22	0,3	-1,3	0,6	1,4	2,2	below
Соколац Sokolac	-0,33	0,37	0,36	-2,9	-0,5	-3,0	-2,8	-1,5	near norm
Билећа Bileca	-1,20	0,12	0,10	2,5	-1,3	3,3	4,0	4,3	below
Гацко Gacko	0,79	0,79	0,31	-1,2	0,8	-1,2	-0,5	-0,4	below
Чемерно Cemetno	0,77	0,78	0,20	-3,0	0,7	-2,7	-2,2	-1,5	below
Требиње Trebinje	0,87	0,81	0,23	5,4	1,0	5,7	6,2	6,6	below
Дринић Drinic	-0,31	0,38	0,34	-1,2	-0,5	-1,3	-0,9	-0,2	near norm
Мрк. Г. Mrkovic G.	-0,48	0,31	0,27	-0,3	-0,8	-0,2	0,3	1,0	below

### Precipitation

During this winter season RS countered below lower tercile corresponding precipitation total (Table 2; fig 5). December was extremely dry; deficit of precipitation, regarding to 1981-2010 climatology, ranged from -98% in Bileca to -83,5% in Han Pijesak. During January at the northern area, surplus of 23% in average, deficit of 32% in the rest; In February particularly, there were recorded surplus of 23,5% in average, southeastern area negative trend of 18%.

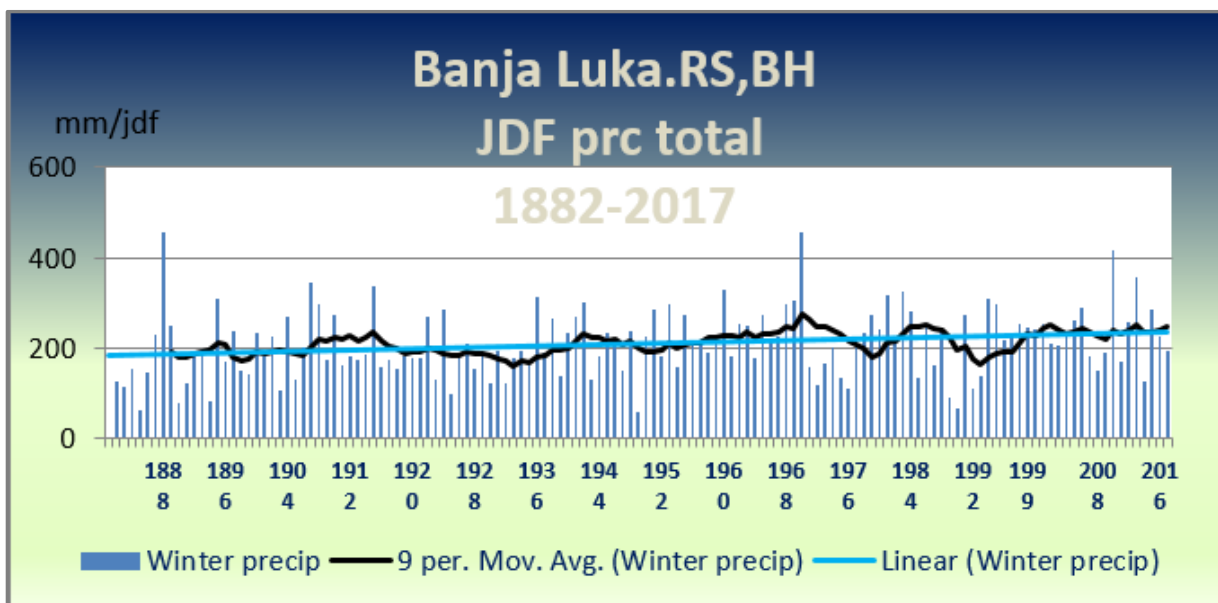


Figure 4:136Years winter precip in mm/djf for Banja Luka (1882-2017)

Table 2. Precipitation statistics for the station over The Republika Srpska (ref 1981-2010)

Station	$z$ (SPI)	NORMSDI ST ( $z$ ) (percentile)	PercRank (ref1981- 2010)	DJF17 (mm)	dj17 % (ref1981- 2010)	sufl/def %	33,33	66,67	50,00	tercile anom. categ
Бања Лука Banja Luka	-0,43	<b>0,34</b>	0,28	<b>192</b>	86	-14,1	209	250	232	below
Приједор Prijedor	-1,00	<b>0,16</b>	0,16	<b>138</b>	68	-32	175	228	208	below
Нови Град Novi Grad	-1,20	<b>0,11</b>	0,13	<b>119</b>	53	-47	190	272	228	below
Добој Doboj	-0,79	<b>0,22</b>	0,19	<b>144</b>	76	-24	175	217	195	below
Бијељина Bijeljina	-1,51	<b>0,07</b>	0,03	<b>84</b>	52	-48	140	182	161	below
Соколац Sokolac	-0,91	<b>0,18</b>	0,20	<b>112</b>	64	-36	150	207	179	below
Билећа Bileca	-1,15	<b>0,12</b>	0,17	<b>241</b>	51	-49	384	550	502	below
Гацко Gacko	-0,89	<b>0,19</b>	0,19	<b>281</b>	58	-42	381	573	472	below
Чемерно Сетегно Cemerno Setegno	-0,96	<b>0,17</b>	0,17	<b>285</b>	58	-42	381	615	488	below
Требинје Trebinje	-1,30	<b>0,10</b>	0,11	<b>262</b>	47	-53	460	681	568	below
Дринић Drinic	-1,39	<b>0,08</b>	0,06	<b>148</b>	41	-59	296	429	403	below
Мркоњић Г. mркоњић с.	-1,09	<b>0,14</b>	0,09	<b>164</b>	65	-35	236	292	267	below

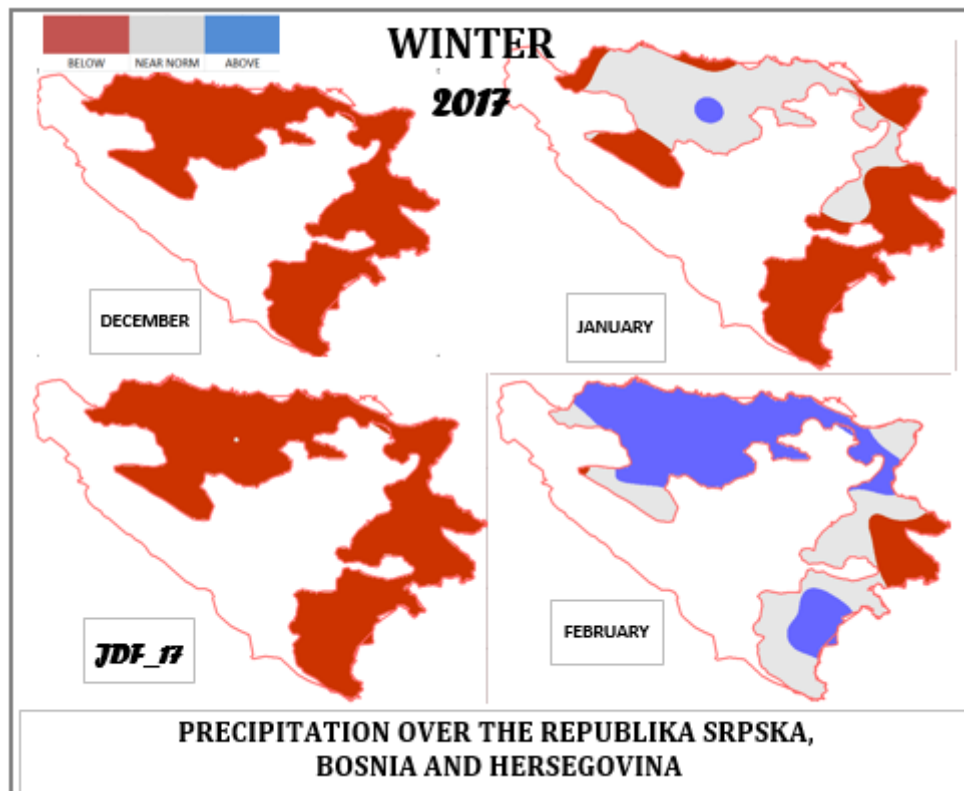


Figure 5: DJF17 Precip in percentage compared to 1981-2010, according to tercile categories showed dry condition (red); in February above upper tercile northther area and south eastern

Historical data series for the winter months of the 1882-2017 for Banja Luka still has shown increasing trend; extreme weather condition was larger at the beginning of this period than nowadays (fig 4). That is the reason of different „normality“ (lower and upper tercile of corresponding precipitation amount). Treating the whole period with measurements, the range of „normal“ DJF precipitation is 178-236mm (85-112%) which belong to 33,3 and **63,8 percentil (table 3)**. For the ref period of the 1981-2010 statistics differ because of increasing trend precipitation (moved to larger values).

Table 3. „Near normal“ range of DJF precip for B.Luka, RS.

coresponding important statistics to tercile					
<b>1981/2010</b>	<i>coresp. prec amount (mm)</i>	<i>Percentile</i>	<i>anom (mm)</i>	<i>def/suf</i>	<i>%Prc from normal value</i>
lower terc	<b>209</b>	0,41	-17	-7,48	<b>93</b>
upper terc	<b>252</b>	0,64	26	11,55	<b>112</b>
<b>1882/2017</b>					
lower terc	<b>178</b>	0,333	-48	-15,24	85
upper terc	<b>236</b>	0,638	10	12,381	112

This is to show relativity of the relevant statistics, depending of the approach of the climate research: longer historical data seria – more precise statistics that have got the information of extremity (extr dry, extr wet). So, this map colours would be differen for climatology 1882-2017 (85% Prec of the average woud be lower normal range, instead of 93% as a lower tercile)

### 1. High impact events:

--The month of January 2016 was extremely cold. There was a cold wave period in January with very low temperatures ranged from -29,6 (mountain station Sokolac) to extremely cold weather at the southern places with modified mediteranean climate as it is Trebinje station were is measured just -9,6 deg. of Celsius.

--Winter 2017 was very cold or extremely cold over the most of Srpska (inbetween 2-4 percentiles).

### 2. Verification of the SEECOF-14&MedCOF-5 climate outlook for the 2016 winter

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)	
	Observed	SEECOF16, MedCOF-6 climate outlook	Observed	SEECOF16, MedCOF-6 climate outlook
RS-BH	<b>Below to near normal</b>	<b>Near normal (40% prob)</b>	<b>Below normal</b>	No signal (means usual climate conditions would prevail)

The assessment of seasonal prediction is that the forecast were partially correct for the mean temperature and false for the precipitation amount.