

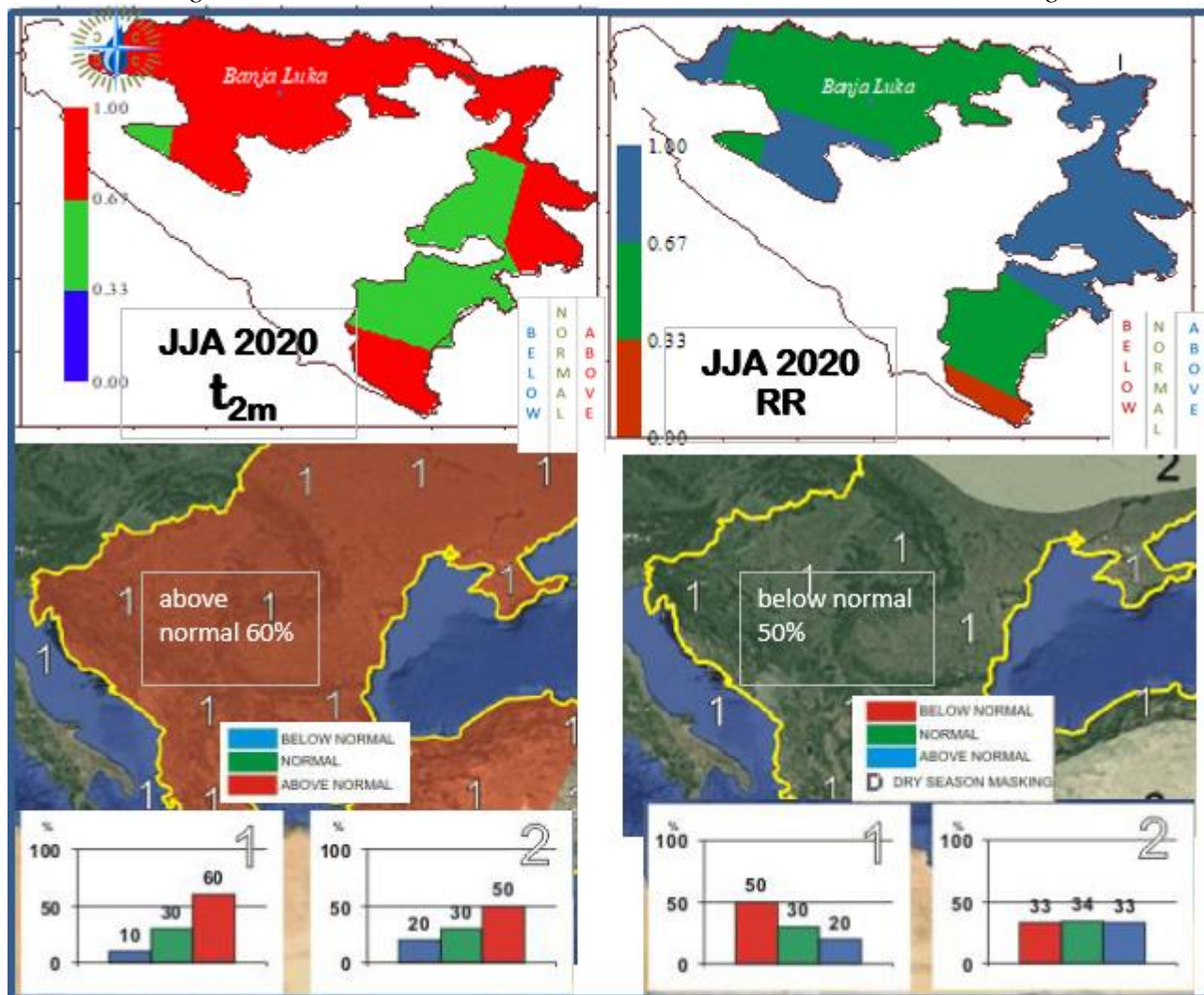


Verification of JJA 2020 outlook over The Republika Srpska, Bosnia and Herzegovina

1. SEECOF-21, MedCOF-12 Climate outlook for the 2020 summer season:

Temperature and Precipitation

According to the seasonal forecast, based on tercile ranks and climate classification ratings, thermal conditions over the Republika Srpska for the climatological summer of 2020 had been described by the following categories: **warmer than normal** (60% of probability) over the entire Republika Srpska (the portion 1, down left). According to observed values, **this prognosis was partially correct**. Precipitation forecast was likely to experience a precipitation deficit (for below normal, 50% probabilities). Observations were in the range normal to above normal weather conditions. The outlook was wrong.



Temp (left) and PRC tot (right) for jja2020- outlook (below) and observed values (above)

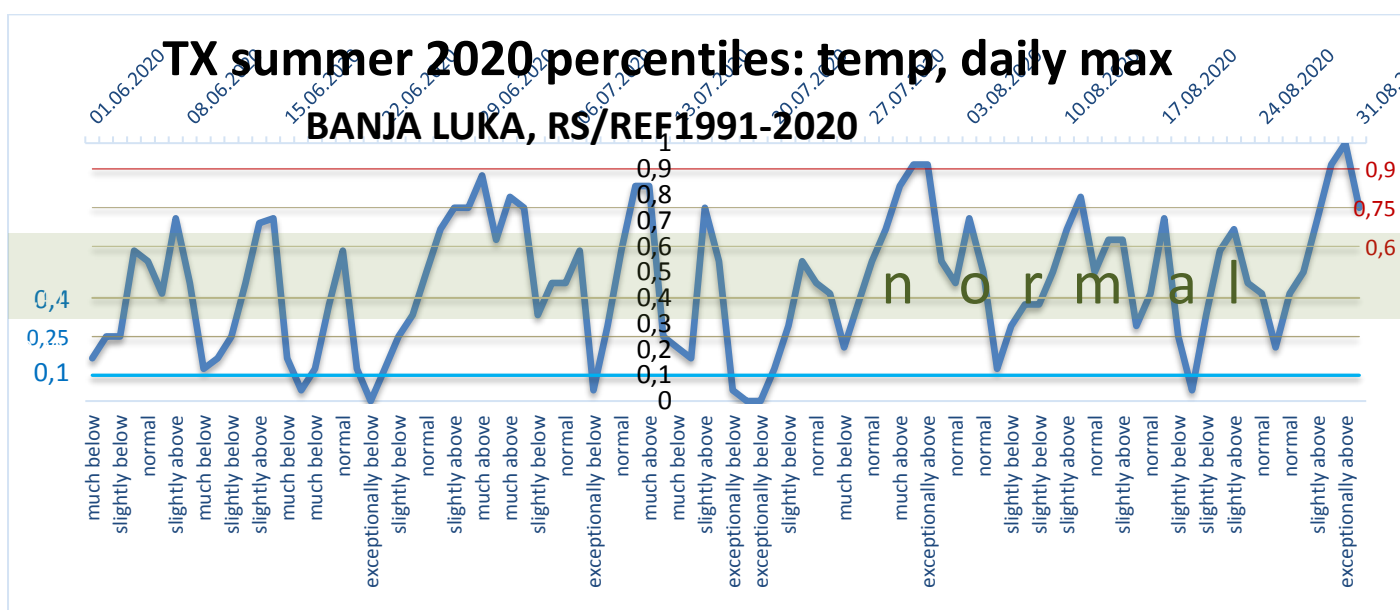
- ❖ The Republika Srpska (RS) registered above normal, warm weather pattern, over the most of areas with reference to standard climatological normal values; Normal summer temperature recorded over middle area of RS; Broken down the previous record of the coldest day, in many places of RS (July, 17-19th, exceptionally below)
- ❖ Rainfall stated over normal to above pattern, below normal over the Southern

1. Analysis of the 2020 Summer season

JJA-2020 t_{mean} - statistics with reference to (ref 1981-2010) in Republika Srpska

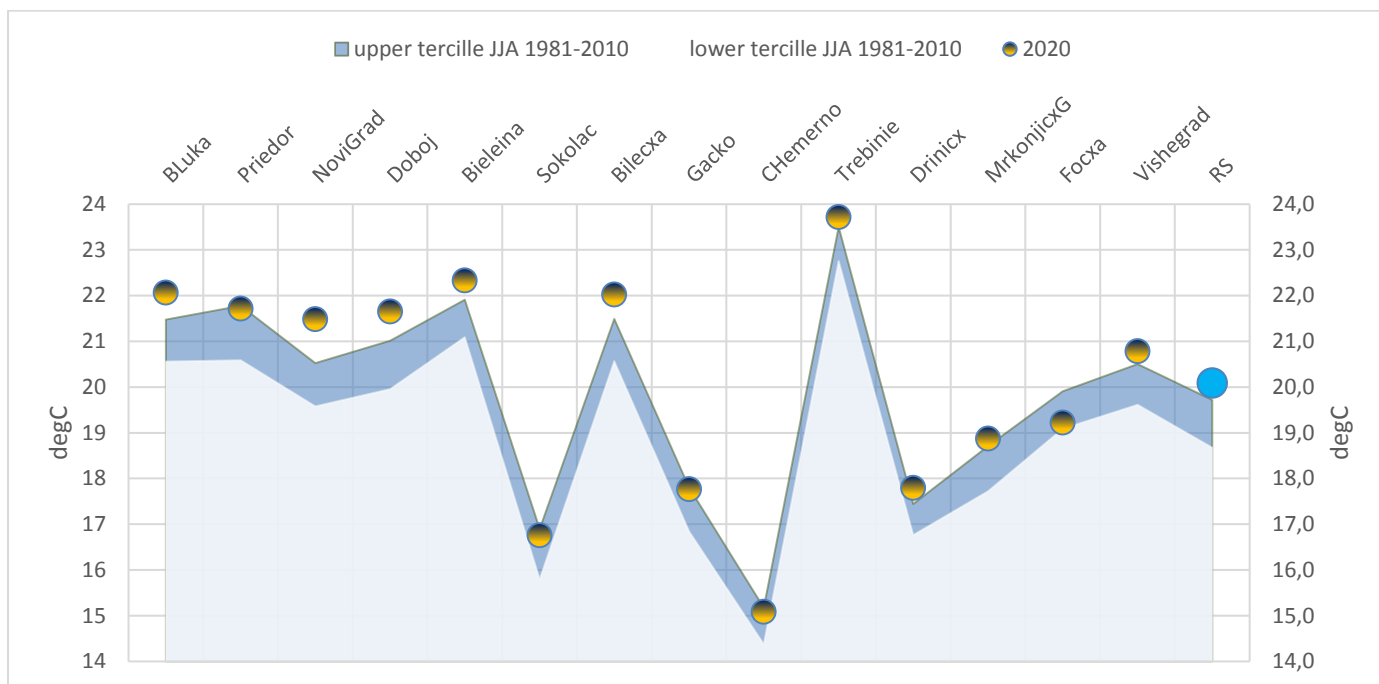
Station	t_{mean} 1981- 2010	STD	z (STI)	Percentile (NORMSDIST)	PercRank 2020	JJA 2020 (mm)	lower tercille	upper tercille	median	tercille category
Бања Лука Вапа Luka	21.0	1.05	1.00	0.84	0.83	22.1	20.6	21.5	20.8	<i>above</i>
Приједор Priedor	21.2	1.08	0.49	0.69	0.69	21.7	20.6	21.8	21.1	<i>above</i>
Нови Град NoviGrad	20.2	1.13	1.17	0.88	0.88	21.5	19.6	20.5	20.1	<i>above</i>
Добој Doboy	20.5	1.00	1.15	0.88	0.86	21.7	20.0	21.0	20.4	<i>above</i>
Бијељина Vijeljina	21.5	1.17	0.75	0.77	0.75	22.3	21.1	21.9	21.4	<i>above</i>
Соколац Sokolac	16.3	1.02	0.44	0.67	0.66	16.8	15.8	16.9	16.3	<i>normal</i>
Билећа Vileca	18.4	7.31	0.49	0.69	0.78	22.0	20.6	21.5	21.0	<i>above</i>
Гацко Gacko	17.3	0.90	0.56	0.71	0.66	17.8	16.8	17.8	17.3	<i>normal</i>
Чемерно Sxeterno	14.8	0.92	0.28	0.61	0.64	15.1	14.4	15.2	14.9	<i>normal</i>
Требиче Trebine	23.3	1.13	0.37	0.64	0.71	23.7	22.8	23.5	23.0	<i>above</i>
Дринић Drinic	17.1	1.12	0.61	0.73	0.80	17.8	16.8	17.4	17.2	<i>above</i>
Фоча Focxa	19.4	1.00	-0.22	0.41	0.49	19.2	19.1	19.9	19.4	<i>normal</i>
МркГрад MrkonicG	18.3	1.12	0.49	0.69	0.75	18.9	17.7	18.7	18.2	<i>above</i>

Temperature was significantly above standard normals of 1981-2010 but not such as like during 2012,2003 and 2017 years.



SUMMER DAYS OF THE **EXCEPTIONALLY BELOW** CATEGORY HAPPENED MORE FREQUENT THAN INSIDE CATEGHORY **EXCEPTIONALLY ABOVE**; THE LOWEST T_{max} HAS BROKEN, THE HIGHEST T_{max} WAS NOT

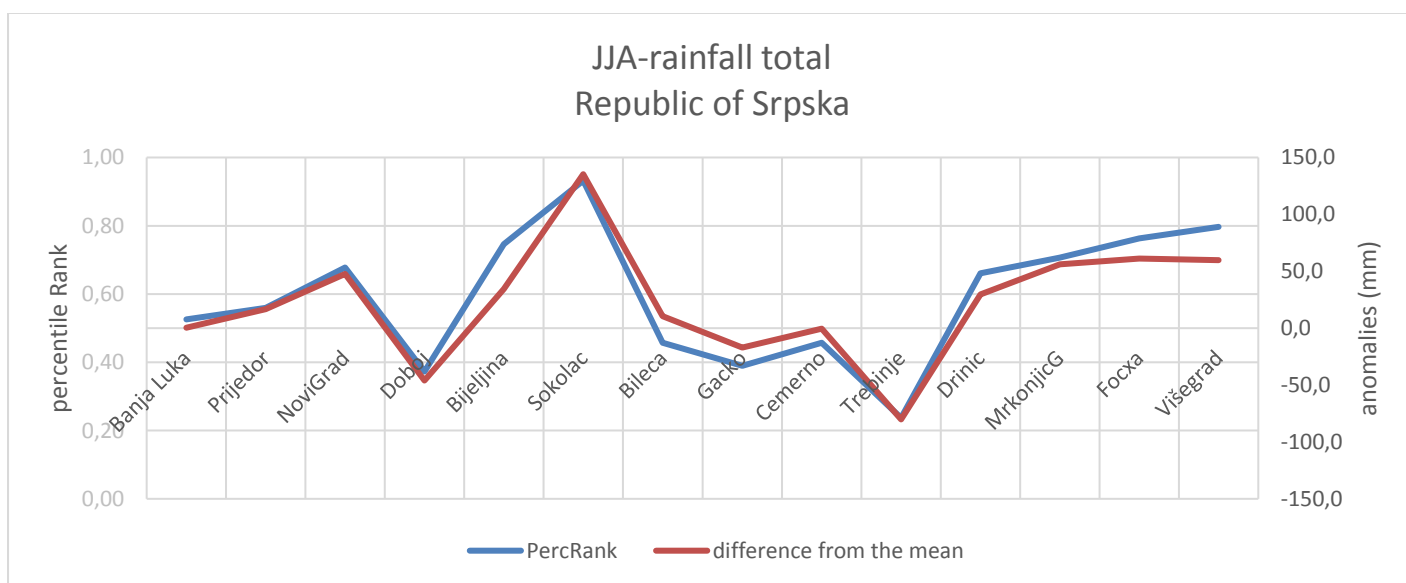
Graphical presentation of JJA 2020 mean temp percentile categories for Banja Luka (above) and over the Republika Srpska stations (below) have shown cooling trend for this year.



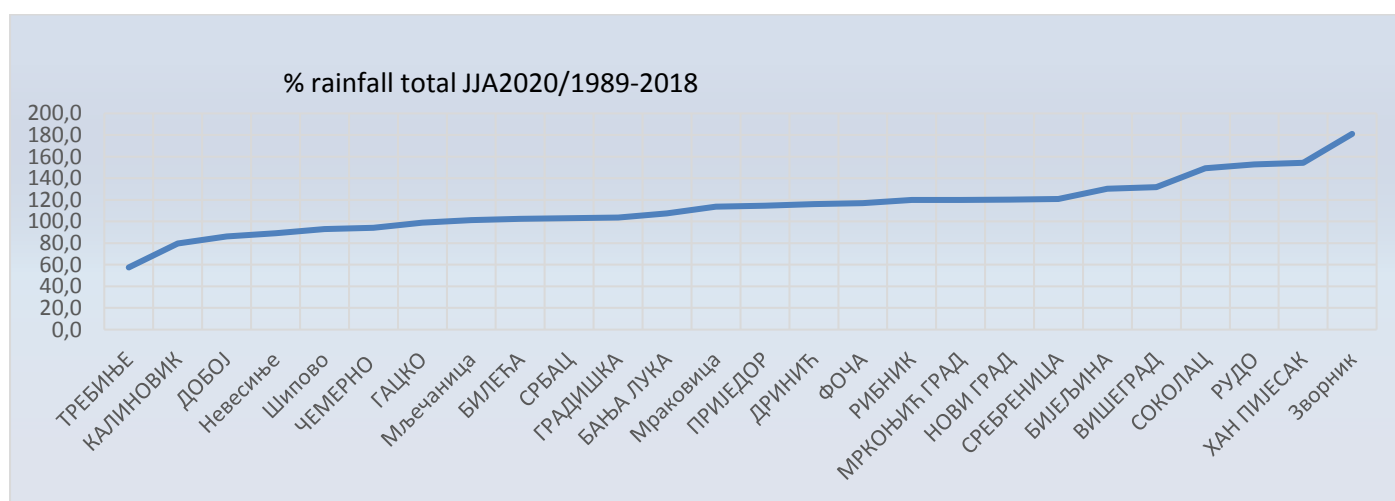
8 exceptionally cool days (< 0.10percentile) occurred, in some places 0.00percentile (abs min of Tmean, Tmax); a few (<4) exceptionally warm days with no one with 1.00 percentile (abs max of temp) regarding to the newest standard WMO normal 1991-2020)

Precipitation

JJA-2020 precipitation statistics over RS (ref 1981-2010);



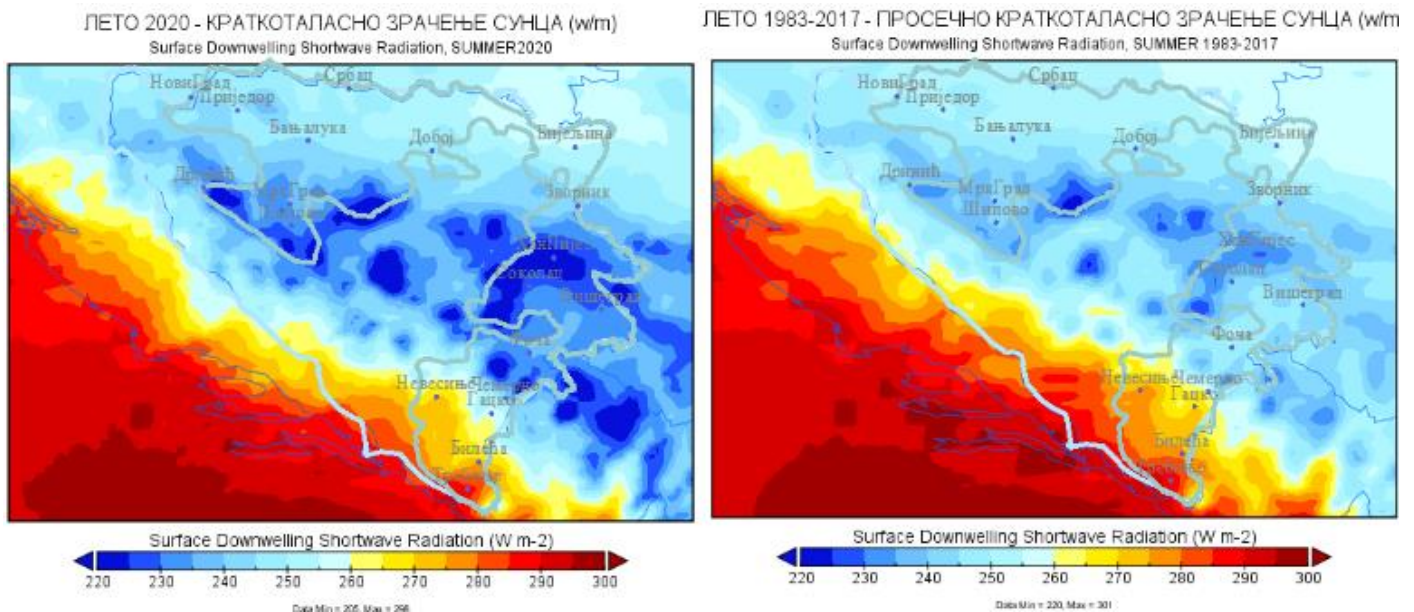
Station	jja1981-2010	STD	z (SPI)	NORMSDIST (z) (percentile)	PercRank 2020	JJA 2020 (mm)	% jja2020 (ref1981-2010)	trend %	lower tercille	upper tercille	median	tercille category
Бања Лука Bana Luka	276	81	0.00	0.50	0.53	276	100	0.1	235	313	273	normal
Приједор Priedor	243	76	0.22	0.59	0.56	260	107	6.9	198	271	219	normal
Нови Град NoviGrad	247	71	0.67	0.75	0.68	295	119	19.3	216	279	246	above
Добој Doboy	284	104	-0.45	0.33	0.37	238	84	-16.2	218	321	272	normal
Бијељина Bijeljina	243	78	0.44	0.67	0.75	278	114	14.2	216	278	255	above
Соколац Sokolac	238	64	2.13	0.98	0.93	373	157	57.0	207	259	239	above
Билећа Bileca	179	71	0.15	0.56	0.46	190	106	5.8	144	196	175	normal
Гацко Gacko	200	84	-0.20	0.42	0.39	183	91	-8.6	158	226	198	normal
Чемерно Sxeterno	224	98	0.00	0.50	0.46	224	100	-0.2	186	254	203	normal
Требинје Trebine	179	97	-0.82	0.21	0.24	99	55	-44.8	133	229	161	below
Дринић Drinic	272	87	0.34	0.63	0.66	302	111	10.9	243	309	251	normal
Фоча Fosxa	215	81	0.76	0.78	0.76	276	129	28.5	175	225	204	above
МркГрад MrkonjicG	264	102	0.63	0.74	0.71	329	125	24.7	227	291	265	above



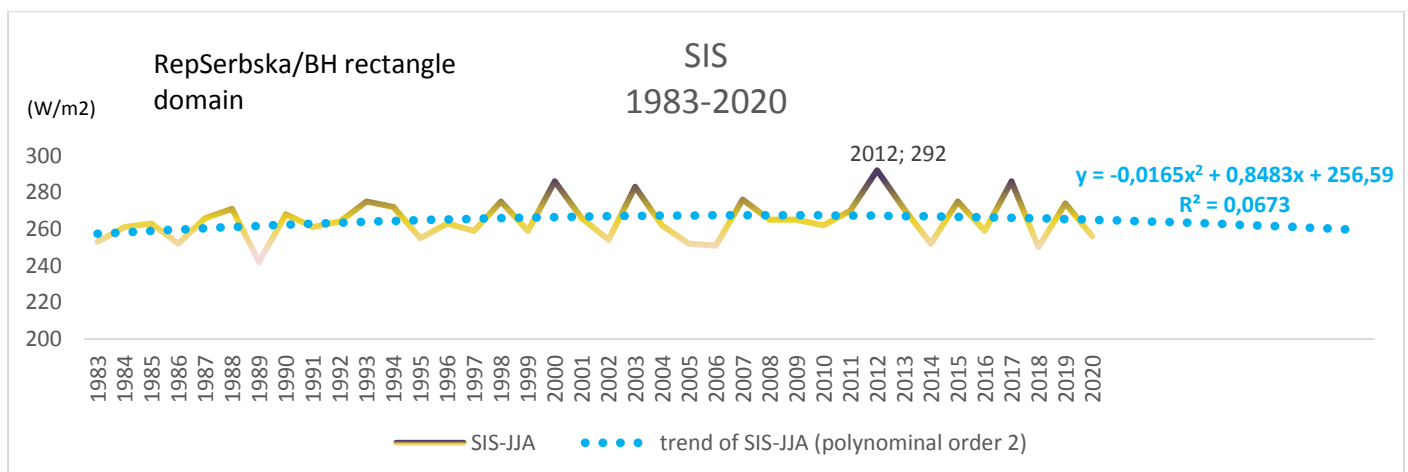
Surface downwelling Shortwave Fluks in Air (EUMETSAT)

This parameter is valuable to describe thermal conditions over the summer time and climate change facing trend.

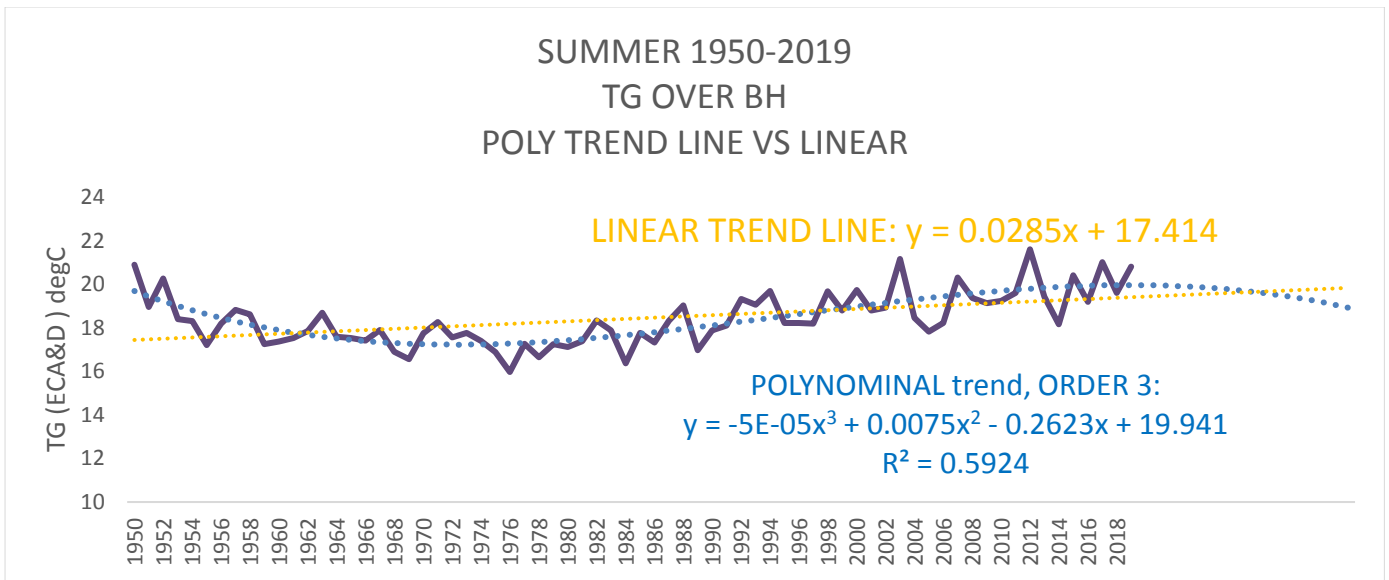
ICDR SEVIRI RADIATION BASED ON SARA-2 METHOD-using satellite data application in climate monitoring of RHMS RS (CMSAF)



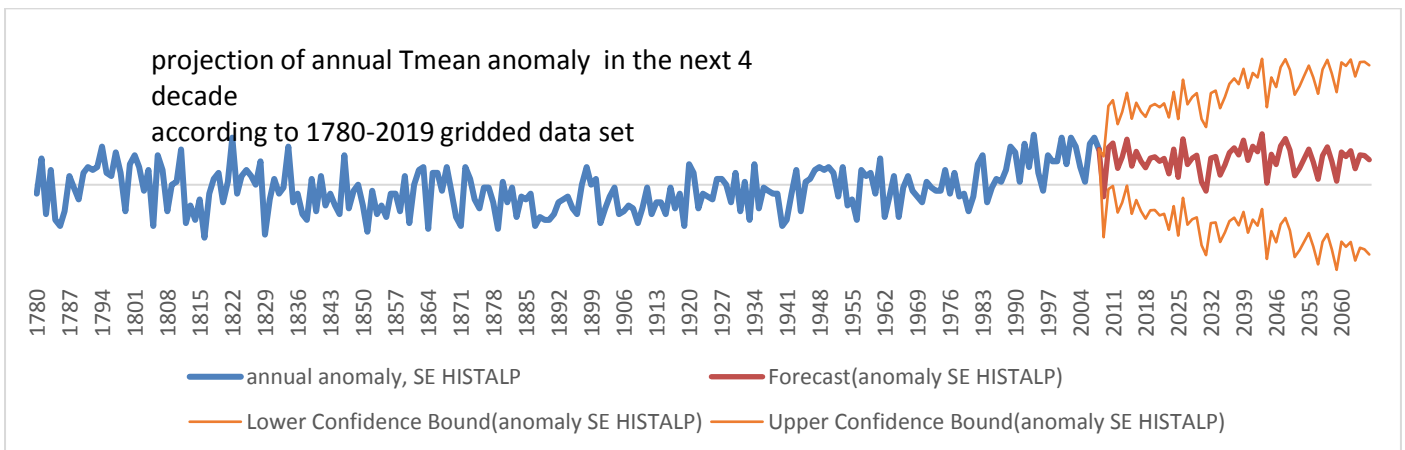
SIS-Surface downwelling Shortwave Fluks in Air for summer 2020 (left) and averaged over 1983-2017



According to the SIS-JJA trend line, it seems to be cooler over the Republic of Serbska and B.Herzegovina in the next summers due to more frequent convective unstability.



Presentation of changing summer tmean trend, according to ECA&D gridded data set has shown cooling trend line over Bosnia and Herzegovina; polynominal trend is consistend with satellite data regarding to CMSAF product of Surface downwelling Shortwave Fluks in Air. Too simple Linear trend line is not appropriate function to describe changing temperature trend ; mean temperature, TG is calculated by WMO standard formula $(t_{07}+t_{14}+2*t_{21})/4$ which is not involved in climate projection models, but calculated by $(T_{max}+T_{min})/2$ which differ from TG more than 2degrees at daily level..



According to gridded data set of ZAMG/HISTALP for South Eastern part of, where Bosnia and Herzegovina belongs, positive anomalies will be decreasing in the next decades, and mean temperature is likely to be near normal values over the 1900-2000 climatology.

2. High impact events:

High impact events: No high impact events.

3.Verification of the climate outlook for the 2020 summer

Country	Seasonal temperature (JJA)		Seasonal precipitation (JJA)	
	Observed	SEECOF, MedCOF <i>climate outlook</i>	Observed	SEECOF, MedCOF <i>climate outlook</i>
The Republika Srpska, BH	Normal to above	<i>above</i>	Normal to above	<i>Below</i>

Assesment:

The outlook for the JJA 2020 summer season: mean temperature-partially correct; precipitation – wrong.