Sixteenth Session of
SOUTH EAST EUROPEAN CLIMATE OUTLOOK FORUM

SEECOF-16 MEETING

DRAFT VERSION

ANALYSIS AND VERIFICATION OF THE SEECOF-15 CLIMATE OUTLOOK FOR SUMMER OF 2016 FOR SOUTH-EAST EUROPE (SEE)

CLIMATE OUTLOOK FOR 2016 SUMMER SEASON FOR SEE REGION

As stated in the SEECOF-15 Consensus Statement on the Seasonal Climate Outlook for the 2016 Summer Season over South-East Europe (document: http://www.seevccc.rs/SEECOF/SEECOF-15/STEP3/Consensus%20Statement%20SEECOF-15.pdf, the probability for above-average summer temperature is increasing across the areas spanning from the western and northwestern, towards the eastern and southeastern parts of the SEECOF region. There is lower probability for exceeding the average summer temperature in the south of Ukraine, along the coasts of the Black Sea, northern Greece and the South Caucasus region (zone 2 in Figure 1, left panel), while there is higher probability for above-average conditions in the south of Greece, most of Turkey, Eastern Mediterranean, Israel and Jordan (zone 1 in Figure 1, left panel). Most of Ukraine, the Pannonian Plain and most of the Balkan Peninsula are likely to experience above- or near-normal summer temperatures (zone 3 in Figure 1, left panel). There is a moderate probability for the onset of heat waves in the southern and eastern parts of the SEECOF region.

Uncertainties in regional predictions are higher for precipitation than for temperature. Summer precipitation totals are likely to be near- or below average in the Caucasus region, south Balkans, coasts of the Black Sea with its hinterland and western part of Turkey, as well as in the south of Ukraine (zone 1 in Figure 1, right panel). The uncertainty is high in the remainder of the SEECOF region (zone 2 in Figure 1, right panel): probabilities for below-, near- or above- average conditions are approximately equal. It should be noted that certain parts of the country, particularly mountain regions, may receive near- or above- normal summer precipitation totals due to the episodes of enhanced convection accompanied by heavy precipitation. Due to dry season masking, it is not possible to forecast summer precipitation totals along the eastern coasts of the Eastern Mediterranean, Crete, in Israel and Jordan.

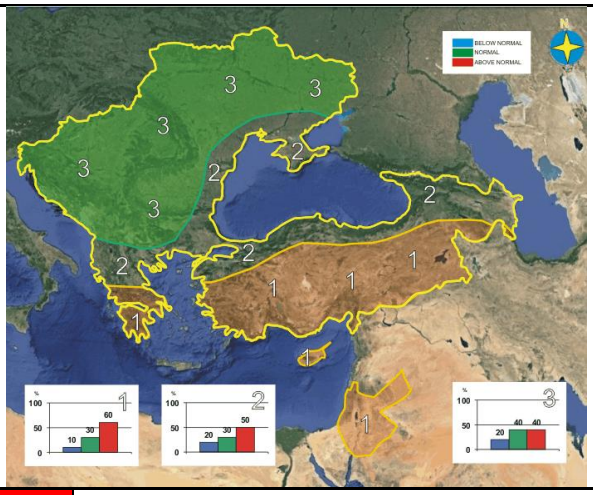
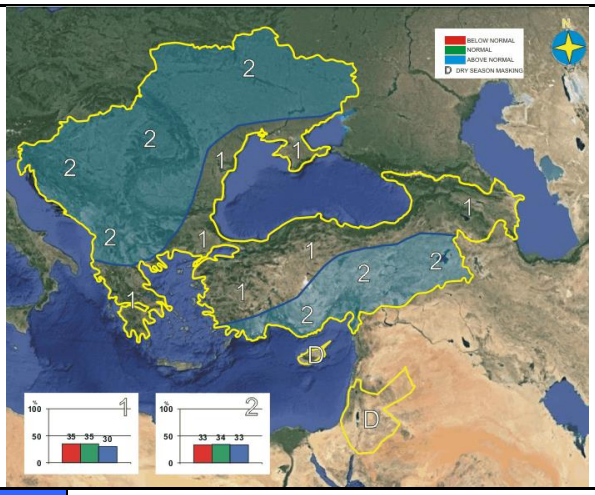
2016 Summer Temperature Outlook		2016 Summer Precipitation Outlook	
			
	Above Normal		Above Normal
	Normal		Normal
	Below Normal		Below Normal

Figure 1. Graphical presentation of the Climate Outlook for the 2016 Summer Season for the SEE Region

SHORT ANALYSIS OF SUMMER 2016 FOR THE SEE REGION

Analyses of the summer season temperature and precipitation anomalies are based on:

- operational products of the European Climate System Monitoring – ECSM (the ECSM system is a technical platform of the DWD, WMO RA VI RCC Node on Climate Monitoring), http://www.dwd.de/rcc-cm;
- seasonal bulletin on climate in the WMO Region VI for the summer of 2016 (ECSM, DWD, WMO RA VI RCC Node on Climate Monitoring), http://www.seevccc.rs/SEECOF/SEECOF-16/Pre-COF/Climate-Report-Summer-Season-2016-exp-RCC-CM.pdf;
- climate monitoring products of the South East European Virtual Climate Change Center – SEEVCCC (Member of the WMO RA VI Pilot RCC Node on Climate Monitoring), http://www.seevccc.rs/imgsrc/clim_mon/201608/, and
- national climate monitoring reports of the following SEECOF-16 participating countries: Armenia, Bulgaria, Bosnia and Herzegovina (the Federation of Bosnia and Herzegovina, Republic Srpska), Croatia, Cyprus, Georgia, Greece, Israel, Montenegro, the former Yugoslav Republic of Macedonia, the Republic of Moldova, Serbia, Slovenia, Turkey and Ukraine (documents available on: http://www.seevccc.rs/SEECOF/SEECOF-16/Pre-COF/).

The entire SEECOF region observed above-normal summer temperatures.

Summer temperatures across the lowlands in most of the SEECOF region were mainly in a range between 18ºC and 25ºC; along the coasts of the Mediterranean, Ionian, Aegean, Caspian, as well as central and southern part of Adriatic Sea, on the south-east of Turkey, in eastern part of the South Caucasus region, in Israel and Jordan, temperatures ranged between 25ºC and 30ºC, at some locations in eastern Jordan, eastern and south-eastern Israel the average temperature was even higher. On the other hand, at some high-lying areas in the Carpathian region, summer temperatures ranged between 12ºC and 16°C. The summer temperatures are presented in Figures 2 and 3 (left panel).

In most of the SEECOF region anomalies ranged between 1ºC and 2ºC above normal; in Ukraine, eastern part of Carpathian region, Bulgaria, along the coasts of the Black, Aegean and Mediterranean Sea, in Israel, Jordan and some parts of the continental Turkey, they were in a range between 2ºC and 3ºC above normal. The exception to this was observed in the easternmost mountainous region of Turkey, where anomalies ranged between -1ºC and 1ºC.

In the entire SEECOF region, June conditions were above normal, with the highest positive anomalies reaching around 3ºC in north-western parts of Ukraine. In eastern Mediterranean, especially in Cyprus, temperature extremes with the highest positive departures were in a range from 8°C up to 10°C, for instance Polis Chrysochou station, where the highest daily air temperature (40.2°C) was 9.9°C higher than normal (30.3°C) and Paphos airport where the highest daily air temperature (37.8°C) was 10.2°C higher than normal (27.6°C). During the period from June 18-25, EMMA warnings indicating yellow awareness level were issued with regard to extremely high temperatures, referring to both maximum and minimum temperatures. On June 19th due to the precipitation deficiency and high temperatures, huge forest fire affected Solia region destroying 18,57 km² of forest area. Also, it should be noted that, Jun was the fifth warmest month on record in Serbia. During the third decade of June, departure of the decadal average air temperature of 4.9°C was observed in Moldova normally occurring once in 10 to 15 years, while in Ararat valley (Armenia) maximum air temperatures reached even 42°C on June 21st. The exception to this was observed in the eastern and mountainous region of Turkey, where monthly anomalies were within average.

Similarly to June, July was characterized by warmer than normal conditions in the entire SEECOF region, with the highest positive anomalies reaching 3ºC. In the middle of July (16th and 17th) eastern and central parts of Ukraine observed record-breaking maximum temperatures. On July 17th Kup'yansk in Kharkov region observed air temperature of 40°C which is considered a very dangerous phenomenon in this region.

In August, above normal mean air temperature lingered across most of the SEECOF region, while in Pannonian Plain, western and central parts of the Balkan the conditions were near normal. High positive anomalies, even reaching to 4ºC were registered in the eastern Mediterranean. For instance, on August 8th, the highest daily air temperature of 40.4ºC was recorded in the inland station Athalassa (the normal is 36.9ºC).

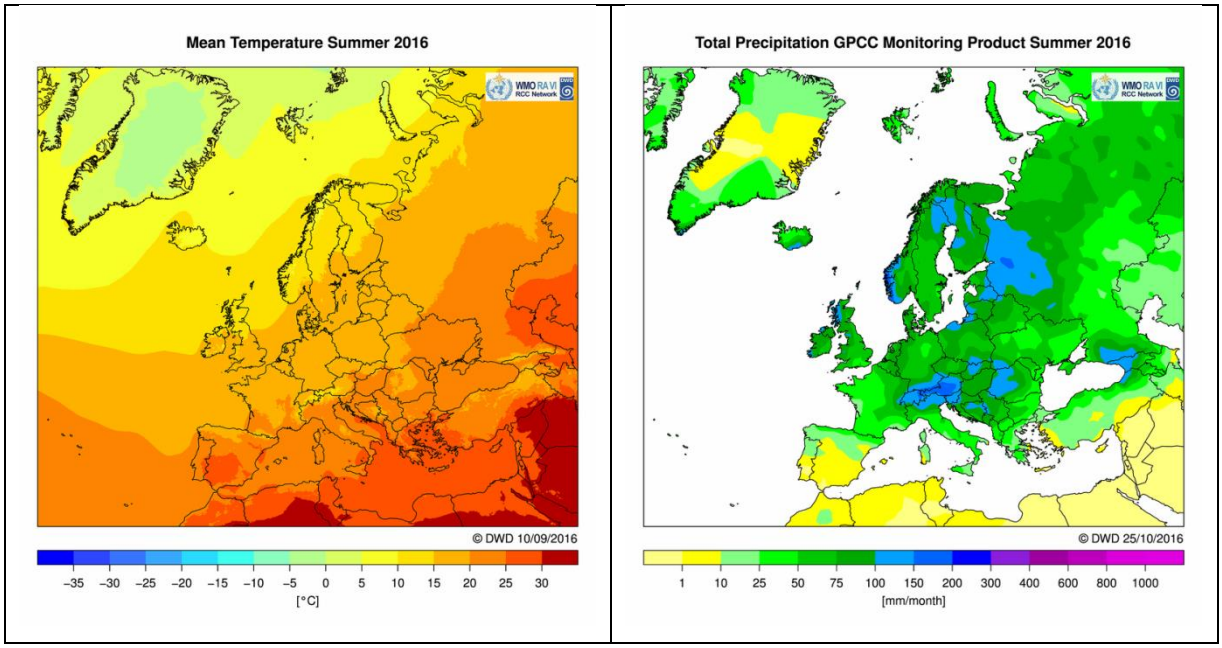


Figure 2. Summer season 2016, Europe – observed temperatures (left panel) and observed precipitation in mm per month (right panel). Source: http://www.dwd.de/rcc-cm

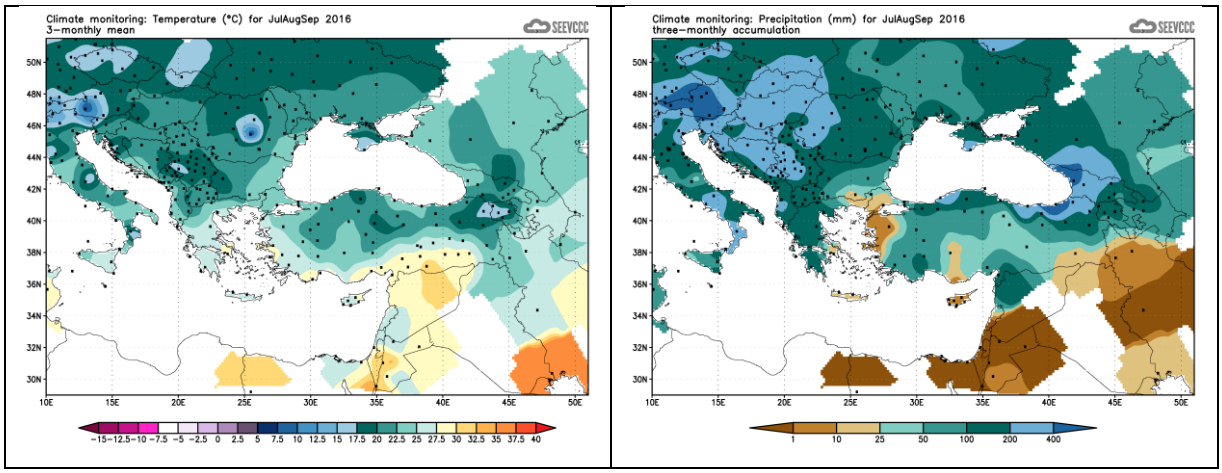


Figure 3. Summer season 2016, SEECOF region – observed temperatures (left panel) and observed precipitation in mm per month (right panel). Source: http://www.seevccc.rs/?p=6

The summer precipitation totals characterized gradual increase from the southeast to the north and northwest of the SEECOF region, ranging from less than 10 mm in the eastern Mediterranean, Israel, Jordan, southernmost parts of Turkey, along the western coasts of the Caspian Sea and its inland, up to 150 mm in Slovenia, some parts of the Dinaric Alps, the Carpathian region, along the eastern coasts of the Black Sea; even higher precipitation totals were recorded on the local level.

Precipitation anomalies characterized great diversity within the SEECOF area. It was drier than normal (<75% of the long-term average) in most of the Ukraine, most part of the South Caucasus, along the western coasts of the Black Sea with its hinterland, in some parts of western and central Turkey, most of the Aegean Sea and Cyprus. It was wetter than normal (>125% of the long-term average), in Pannonia Plain, western parts of Carpathian region, some areas within the region of Dinaric Alps, along the coasts of the Ionian Sea, eastern part of Turkey and south of the Caucasus region while certain locations in southern Greece

experienced considerably wetter conditions. It was normally wet in the remainder of the SEECOF region. The summer precipitation anomalies are presented in Figures 4 and 5 (right panel).

During June, it was drier than normal, in easternmost part of Ukraine, eastern Mediterranean, some northern parts of Aegean Sea and some parts in continental Turkey, while in north-western part of Ukraine, along the eastern coasts of the Black Sea and mountainous region of South Caucasus region, it was considerably drier, with the deficits reaching up to 70 mm. On the other hand, wetter than normal conditions were registered along the coasts of the Adriatic and Ionian Sea, southern and north-eastern parts of Turkey, while in Carpathian region and in southern Greece, it was considerably wetter than normal. High positive anomalies up to 70 mm were recorded, peaking over Carpathian region. In the rest of the SEECOF region the June totals were within the average.

Second and third decade of June, in Carpathian region as well as in Ukraine, was characterized by convective activity inside the fronts and warm, wet and unstable air masses. It was followed by thunderstorms, heavy precipitations, hail and wind gusts reaching up to 25 m/s. For example, on June 17th the highest daily rainfall of 99 mm was recorded in Konotop of Sumy region (northwest part of Ukraine), while HP Hincesti (Moldova) received 71 mm of precipitation in 40 minutes on June 24th. Unfavourable weather conditions caused a disruption of power, telecommunication, utility and transport services.

July was drier than normal, in south-easternmost part of Ukraine and along the coasts and hinterland of Adriatic Sea, while in eastern Balkans, as well as hinterland along the north-western coast of the Turkey, it was considerable drier, with a relative anomaly below 20% (total sum less than 50 mm). July precipitation sums were above average in western parts of the Balkan and some parts of central Balkans, while in some parts of Pannonian Plain, western and central Caucasus region and mountainous region on the northeast of Turkey, it was considerably wetter than normal, with positive anomalies reaching up to 70 mm. The July precipitation sums were within the average in rest of the SEECOF region.

August was considerably drier than normal in most of Ukraine, some parts along the west coasts of the Black Sea, and in central and eastern part of South Caucasus region. Wetter than normal conditions were observed in some parts of Carpathian region, central and southern Balkans, while it was considerably wetter in northeast of Ukraine, mountainous region on the west of Turkey with relative anomaly reaching up to 200% (total sum up to 200 mm). In the remainder of the SEECOF region it was near-normal.

On August 6th and 7^{th,} strong cyclone was followed by wet and unstable air mass which affected southern parts of the Balkans causing thunderstorms, heavy precipitations, hail and wind gusts. On August 7th extremely high daily precipitation sum of 114 mm was measured on PS Butel, (Skopje, the FYR Macedonia). Overnight between August 6th and 7th, 96.5 mm of precipitation was recorded in only 1 hour, causing flash flood in Skopje valley. It led to damages of road, big financial losses and human casualties.

During July, south-eastern part of Bulgaria experienced relatively long period of dry and hot weather followed by consecutively dangerous fire weather conditions. The same phenomenon, characterized by high temperatures, ranging between 35°C and 40°C and the precipitation deficit took place in July in most of Ukraine.

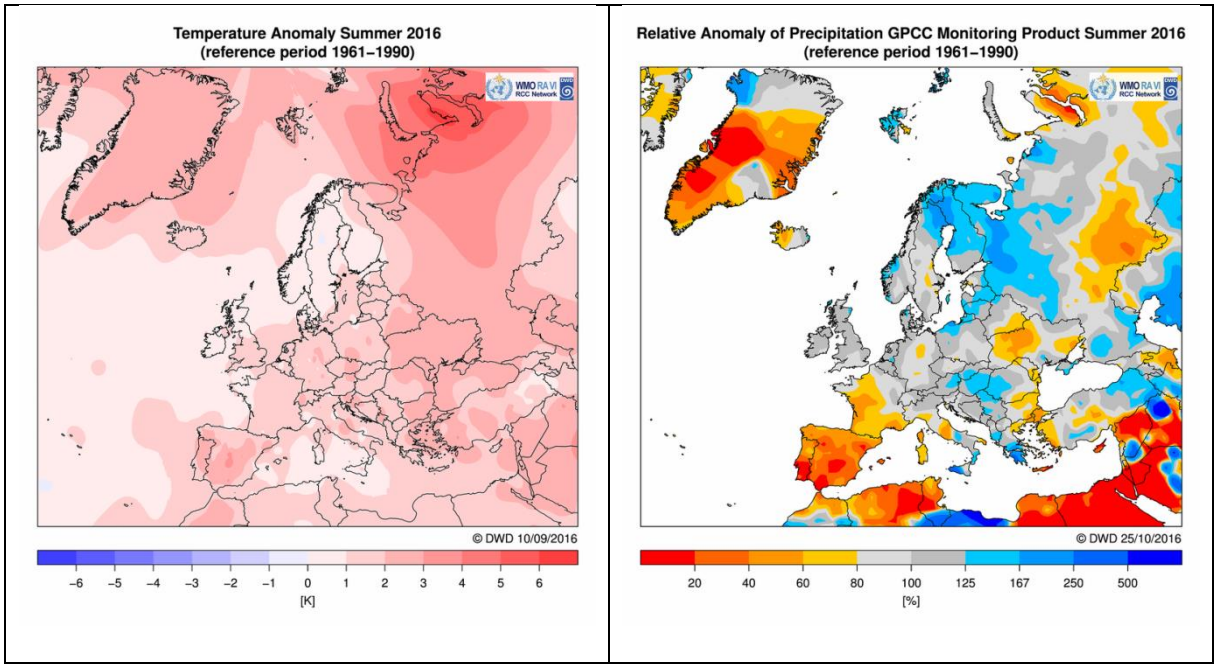


Figure 4. Summer season 2016, Europe – observed temperature anomalies (left panel) and observed precipitation anomalies in percent of 1961-1990 normal (right panel). Source: http://www.dwd.de/rcc-cm

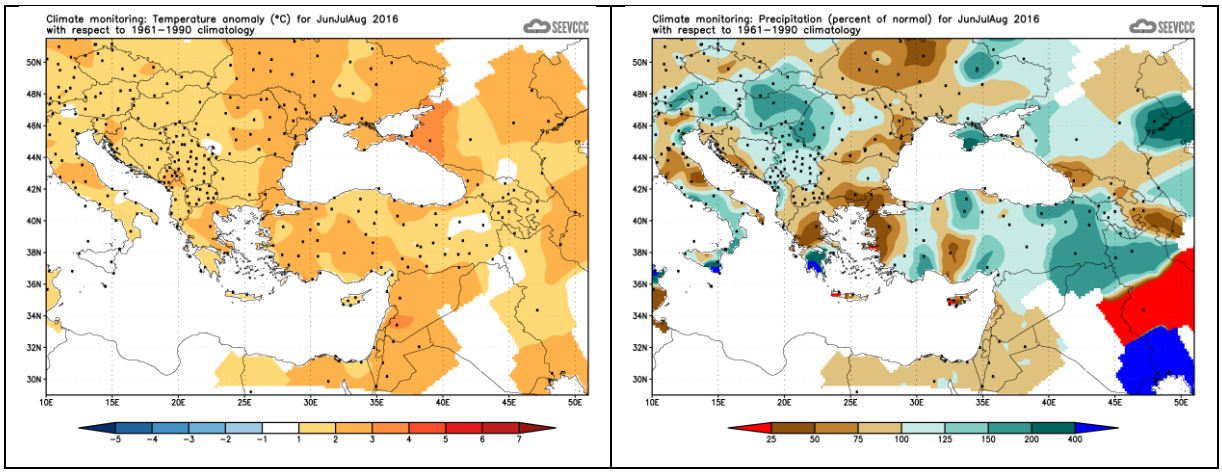


Figure 5. Summer season 2016, SEECOF region – observed temperature anomalies (left panel) and observed precipitation anomalies in percent of 1961-1990 normal (right panel). Source: http://www.seevccc.rs/?p=6

VERIFICATION OF CLIMATE OUTLOOK FOR 2016 SUMMER

The SEECOF-15 Climate Outlook for the 2016 summer concluded that in the whole SEECOF region there was more likelihood for the occurrence of above-average temperature.

The probability for above-average summer temperature was expected to increase across the area spanning from the western and northwestern, towards the eastern and southeastern parts of the SEECOF region. The lower probability for exceeding the average summer temperature in the south of Ukraine, along the coasts of the Black Sea, northern Greece and the South Caucasus region was predicted, while the higher probability for above-average conditions in the south of Greece, most of Turkey, Eastern Mediterranean, Israel and Jordan was expected.

In most of Ukraine, the Pannonian Plain and most of the Balkan Peninsula above- or near-normal summer temperatures were predicted. Also, a moderate probability for the onset of heat waves in the southern and eastern parts of the SEECOF region is outlined. On the basis of the aforementioned regional, sub-regional and national climate monitoring products, it turned out that the monitored anomalies of the mean summer air temperatures were above normal in most of the SEECOF region, which means that the climate outlook for the summer air temperature was accurate. The summer temperature predictions were wrong for eastern and central Turkey, where anomalies were within average.

According to the SEECOF-15 Outlook, it was predicted that the uncertainties in regional predictions would be higher for precipitation than for temperature. It was outlined, that in the South Caucasus region, south Balkans, along the northern, eastern and western coasts of the Black Sea summer precipitation totals were likely to be near- or below- average, which was observed afterwards. On the other side, in northern part of Turkey, near- or below-normal summer precipitation totals were predicted, which was not correct (above normal values were recorded). It was also emphasized that in rest of the SEECOF region, it was not possible to predict summer precipitation totals due to equal chances for below-, near-, or above-normal conditions, or due to the dry season masking effect. Consequently, those regions were not taken into consideration for the verification of the summer precipitation.

APPENDIX A: Contributors to the pre Pre-COF of SEECOF-16

- World Meteorological Organization
- Deutscher Wetterdienst, the Federal Republic of Germany
- South East European Virtual Climate Change Center hosted by the Republic Hydrometeorological Service of Serbia, the Republic of Serbia
- Royal Netherlands Meteorological Institute, the Netherlands
- Armenian State Hydrometeorological and Monitoring Service, the Republic of Armenia
- National Institute of Meteorology and Hydrology, the Republic of Bulgaria
- Meteorological and Hydrological Service, the Republic of Croatia
- Meteorological Service, the Republic of Cyprus
- Department of Hydrometeorology, the Republic of Georgia
- Hellenic National Meteorological Service, the Republic of Greece
- Israel Meteorological Service, the State of Israel
- Republic Hydrometeorological Institute, the former Yugoslav Republic of Macedonia
- State Hydrometeorological Service, the Republic of Moldova
- Hydrological and Meteorological Service of Montenegro, the Republic of Montenegro
- Federal Hydrometeorological Service of the Federation of Bosnia and Herzegovina, the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina
- Republic Hydrometeorological Service of Republic of Srpska, Republic Srpska, Bosnia and Herzegovina
- Republic Hydrometeorological Service of Serbia, the Republic of Serbia
- Slovenian Environment Agency, Slovenia
- Turkish State Meteorological Service, the Republic of Turkey
- Ukrainian Hidrometeorological center, Ukraine

APPENDIX B: **Analysis and verification of the SEECOF-15 climate outlook for the 2016 summer season:**
Verification summary based on the national reports and contributions of the participants of Pre-COF of the SEECOF-16 meeting

Country	Seasonal temperature (JJA)		Seasonal precipitation JJA		High Impact Events
	Observed	SEECOF-15 climate outlook for temperature	Observed	SEECOF-15 climate outlook for precipitation	
Armenia (1)	**Above normal**	**Above normal to normal**	**Above normal to normal**	**Above normal to normal**	The summer 2016 was characterized by a strong wind, heavy precipitation and in particular intense hail accompanied by large hailstones. **June:** On June 4th and 6th in Yerevan Martuni (Gekharquinig region) and Ijevan (Tavush region) heavy hail storm was observed with hailstones of 2 mm in diameter. On June 12th heavy rainfall (44mm/12h) was observed in Ijevan (Tavush region). **July**: Torrential rainfall, was observed on July 2th and 6th in Talin (55mm/2h), Fantan (40 mm/3h), Aparan (37 mm/3h), (Argatsotn and Kotayk region) accompanied by strong wind with gusts reaching 25-28 m/s .On July 10th , Armavir and Yereva observed hailstones of 28 mm in diameter. The highest July air temperature reaching 41-42°C was measured in Ararat on July 21th **August:** Significant precipitations deficit was observed across most of the country. Strong wind gusts reaching 25 m/s were observed. Strong wind with gusts reaching 25-28 m/s was

					observed in different areas during the summer.
Federation of Bosnia and Herzegovina, Bosnia and Herzegovina (1)	**Above normal**	**Above normal to normal**	**Below normal**	**No clear signal**	No high impact events.
Republic Srpska, Bosnia and Herzegovina (1)	**Above normal**	**Above normal to normal**	**Normal to Above normal** in the most of the territory	**No clear signal**	On the southeast of the territory - stations Trebinje and Bileća received less than 10 mm – 3% from the average compared to the August rainfall total.
Bulgaria (1)	**Above normal**	**Above normal to normal** in the most of the country **Above normal** along the coasts and in the hinterland of the Black Sea	**Normal** in most of the country **Below normal** Along the coasts and hinterland of the Black Sea	**No clear signal** In the most of the country **Normal to below normal** along the coasts and in the hinterland of the Black Sea	Warmer than normal conditions were observed during all summer months in 2016. Mostly dry conditions were observed during all months, out of which July was the driest. The southeast of the country experienced a relatively long dry period and consecutively dangerous fire weather conditions. Dangerously hot weather lasted couple of days in the middle of June which was announced by the weather service releasing the appropriate weather warnings. No temperature records have been broken.

Croatia (1, **5**)	**Above normal**	**Above normal to normal**	**Above normal** wider area of Osijek, Pazin and island Mali Lošinj **Normal** in the most of the country **Below normal** Wider area of Poreč, Šibenik, Split, and island of Hvar	**No clear signal**	Summer 2016 was extremely warm in most of the country. Two heat waves were observed during summer, the first one was lasting from June 23rd to 26th, and the second one from July 10th to 14th, but none of them was as long-lasting and intense as in summer 2015. In all 3 months severe weather phenomena caused by convective instabilities (thunderstorms, hail, heavy rains, flash floods and watersprouts) were observed across most of Croatia. They were more common in June and August. In June, record-breaking daily precipitation totals were observed in Ploče, south Adriatic (160 mm, measurements from 1978) and in Pazin, Istra (74 mm, measurements from 1961). In August, record-breaking daily precipitation totals were observed in Mali Lošinj, north Adriatic (96.2 mm, measurements from 1961)
Cyprus (5)	**Above normal**	**Above normal**	Generally **Below** normal	**Dry season masking**	**June** Temperature extremes were recorded with highest positive departures between 8 and 10°C, like Polis Chrysochou station where the highest daily air temperature (40.2°C) was 9.9°C higher than normal (30.3°C) and Paphos airport where the highest daily air temperature (37.8°C) was 10.2°C higher than normal (27.6°C). During June 18-25, 8 EMMA warnings indicating yellow awareness level were issued in regard to the extremely high temperatures, referring to maximum and minimum temperatures. On June 19th outbreak of a huge fire was registered in Solia region destroying 18,57km² of forest area. Due to the high temperatures and the low percentages of relative humidity, it was difficult to bring fire under control. The lowest daily air temperatures were also observed, with negative departures between 5 and 6°C below normal, like the

					mountainous station of Prodromos where an extreme minimum of 9.1°C was by 5.9°C below station's normal (15.0°C). During June local showers or thunderstorms caused by thermal instability were recorded on 9th, 10th and 11th June resulting in accumulated precipitation of 29% of normal. In certain areas, like Kalavasos damn and Athalassa stations the accumulated precipitation sums was higher than normal, amounting to 489% and 173% of normal, respectively. **July** Extreme highs and lows (both maximum and minimum departing by 4°C of normal) were recorded. Note the 39.1°C highest maximum of Polis Chrysochous station departing by almost 6°C from normal and the 33.1°C highest maximum of Prodromos station departing around 5°C from normal. Two highest minimums with positive departures higher than 4°C of normal, the first at Athalassa station on 6th July and the second at Pafos airport on 24th July. At Prodromos station lowest maximum (23.5°C) and lowest minimum (12.8°C) temperatures were recorded with negative departures higher than 4°C from normal. On 5th, 23rd and 31st July episodes of thundery activity and isolated showers resulted in accumulated precipitation accounting for 21% of the normal. Extreme accumulated precipitation was recorded in several areas, like Saittas with 38.8 mm of precipitation which is 388% of normal**.** **August** During the period between 2nd and 5th August, the maximum temperatures of Polis Chrysochous station were diverted by 4°C higher than the normal maximum of the station. Generally, the highest monthly temperature maximum of 40.4°C was recorded on 8th August over the inland station of Athalassa (average 36.9°C). For a sequence of days EMMA warning for high temperature was issued.

Georgia (1)	**Above normal**	**Above normal**	**Normal** in most of the territory excluding several stations where it was above or below than normal	**No clear signal**	No high impact events.
Greece (2, **5**)	**Above normal**	**Above normal**	**Near to below normal** in most of the country	**No clear signal** on the north of the country **Normal to below normal** in the most of the country	No high impact events.
Israel (5)	**Above normal**	**Above normal**	**No comment**	**Dry season masking**	No high impact events.
he former Yugoslav Republic of Macedonia (5)	**Slightly above normal**	**Above normal to normal**	Very variable precipitation regime	**No clear signal**	**June** The highest minimum air temperature was exceeded in the following places**:** 21.0°C on 24th in Ohrid, 22.4°C on 24th in Prilep, 23.6°C on 23th in Skopje. **August** On August 6th Skopje valley was affected by a flash flood caused by heavy rain. The extreme precipitation of 96.5 mm that was

					registered in Skopje during 5 hours has 0.1% probability of occurring once in a thousand year. There were human victims and lot of damages on the local houses and fields. Berovo observed highest minimum air temperature of 17.6°C on 7th August.
Republic of Moldova (5)	**Above normal**	**Above normal to normal**	**Near to below normal**	**No clear signal**	During summer, thunderstorms, fog, hail and wind intensifications up to 25 m/s (Jun MS Camenca) were recorded. There extreme meteorological phenomena as shower rainfalls and hail: On June 1st MS Chisinau observed 63 mm of precipitations in 4 hours and 30 minutes, at the MS Baltata in 4 hours - 53 mm, at the AMP Rezina and HP Rezina in 12 hours less than 51-66 mm; On June 3rd the MS Leova observed 65 mm of precipitation in 7 hours On June 13th the MS Ceadir-Lunga observed 69 mm of precipitations in 1 hour and 45 minutes, on June 14th at the AMS Soldanesti observed 55 mm of precipitation in 12 hours Overnight 18th to 19th the MS Bravicea received 73 mm in 10 hours, the AMP Singerei and Nisporeni received 52 mm and 56 mm in 12 hours, respectively. However, on June 18th hail was recorded; with the highest diameter up to 25 mm in MS Bravicea and up to 30 mm at the Cornesti. On June 24th at the HP Hincesti received 71 mm of precipitations in 40 minutes, the AMP Straseni received 52 mm in 1 hour; On June 28th the MS Cornesti received 30 mm in 1 hour and 101 mm in 7 hours - the MS Stefan-Voda received 81 mm in 5

					hours, at the MS Camenca - received 70 mm in 8 hours; On July 3rd the Dumeni received 32 mm of precipitation in 50 minutes; On August 21st the AMP Singerei received 52 mm of precipitations in 12 hours; On August 24th the MS Bravicea received 99 mm in 5 hours. Isolated heavy rainfalls observed in June, accompanied by hail caused damages to crops and material damages to the national economy. Anomalous warm weather on the territory of the country was recorded in the 3rd decade of June, when decadal average of the temperature was 4.4-5.6°C higher than the norm and which was first time in the entire period of observations.
Montenegro (1,5)	**Above normal**	**Above normal to normal**	**Normal** in the large part of the country **Above normal** from central to southern part of the country	**No clear signal**	No high impact events.

Serbia (1,**5**)	**Above normal**	**Above normal to normal**	**Above normal**	**No clear signal**	June 2016 was the fifth warmest on record in Serbia. Record-breaking number of tropical nights in June was registered at 8 main stations. Zrenjanin observed highest Jun precipitation total on record. July 2016 was the third wettest on record in Negotin, Leskovac and Vranje. August 2016 was the second wettest on record on Zlatibor and Pozega, and fourth wettest in Banatski Karlovac. During summer 2016, only one heat wave was registered in the period from 17 to 25 June in Vranje and Dimitrovgrad. It was the third wettest summer on record in Zrenjanin.
Slovenia (5)	**Above normal**	**Above normal to normal**	**Below normal** at approximately one fifth of the stations **Normal** at approximately half of the stations **Above normal** at approximately one third of the stations	**No clear signal**	The highest daily air temperature in summer 2016 in Slovenia was measured on 12th July 2016 at two meteorological stations: Metlika and Črnomelj, both in south east of Slovenia. At both stations, daily maximum air temperature reached 35.0°C. Higher temperatures were not measures in Slovenia in summer 2016. There wasn't any distinctive heat wave during the season. There were four episodes of severe weather in summer 2016: 25–27 June: strong thunderstorms with locally heavy precipitation (in northern, eastern and southern parts of country), wind (in eastern part of country) and hail (in south: Brkini, Snežnik and Javorniki). 13 July: strong local thunderstorms in northern, eastern and northeastern parts of Slovenia. 15 August: strong local thunderstorms over areas of Maribor, Mislinjska dolina, central parts of the country and in east of the country. 29 August: strong local thunderstorms over areas of Slovenj Gradec, Velenje, Celje, Maribor, Škofja Loka, Vrhnika, Postojna and Ribnica.

Turkey (2)	**Normal to Above normal** (**Near normal** in the eastern and central part of the country)	**Above normal**	**Above normal** mostly in the northern areas **Below normal** in the south of the country	**Normal to below normal** in the south and southeast of the country **No clear signal** in most of the territory	In June 2016, strong wind caused material damage on the houses and some vehicles in Gumusane. Agriculture was affected by hail in Konya, Eregli, Kahramanmaras and Bilecik. In July 2016, heavy rain caused flood and landslide in Ordu. In Kayseri, heavy rain led to flooding and transportation disruption claiming one casualty due to flooding. In August 2016, agricultural areas were affected by hail in Aydin, Kastamonu and in Isparta. Transportation was disrupted due to heavy rain in Eksisehir, Ankara, Kars and Antakya.
Ukraine (5)	**Above normal**	**Above normal to normal**	**Extremely unequal distribution of terciles across the country** **Below normal** in north and west parts of country **Above normal** in north-east parts of country	**No clear signal** in most of the country **Below normal to normal** in the southeast of the country	The highest daily temperature during summer 2016, measuring 40.0°C was observed on July 17th in Kup'yans of Kharkov region and it was very dangerous phenomena. On June 17th - the highest daily precipitation was recorded in Konop of Sumy region (north-east of country) – 99 mm.

Note:
1 – Basic climatological period (1961-1990)
2 – Basic climatological period (1971-2000)
3 – Basic climatological period (1951-2000)
4 – Basic climatological period (1980-2009)
5 – Basic climatological period (1981-2010)
6 – No information about the basic climatological period