



Seventeenth Session of SOUTH EAST EUROPEAN CLIMATE OUTLOOK FORUM

SEECOF-17 ONLINE MEETING

DRAFT VERSION

ANALYSIS AND VERIFICATION OF THE SEECOF-16 CLIMATE OUTLOOK FOR WINTER OF 2016/2017 FOR SOUTH-EAST EUROPE (SEE)

CLIMATE OUTLOOK FOR 2016/2017 WINTER SEASON FOR SEE REGION

As stated in the SEECOF-16 Consensus Statement on the Seasonal Climate Outlook for the 2016/2017 Winter Season over South-East Europe (document: http://www.seevccc.rs/SEECOF/SEECOF-16/COF/Consensus_Statement-SEECOF-16.pdf) positive gradient of probabilities for the warmer-than-normal winter, stretching from the north to the south of the SEECOF region was expected (zones 2 and 3 in Figure 1). The exception was domain of the Pannonian Plain, central parts of the Balkan Peninsula, Carpathian region and Ukraine (zone 1 in Figure 1), where the normal winter temperature conditions were favoured.

Although precipitation uncertainties are higher than for temperature, a wetter-than-normal (zone 1 in Figure 2) winter was favoured along the coasts and its hinterland of Adriatic, Ionian and Aegean Sea, whereas drier-than-normal winter was likely to predominate (zone 3 in Figure 2) in Eastern Mediterranean, Israel, Jordan, southern and south-eastern parts of Turkey, eastern and south part of South Caucasus region.

Seasonal averages cannot provide details about short spells of weather during the season. It was suggested that even in an average season, spells of severe wintry weather (for example: winter storms, very cold episodes, very wet spells) could have occurred and lead to significant local socio-economic impacts.

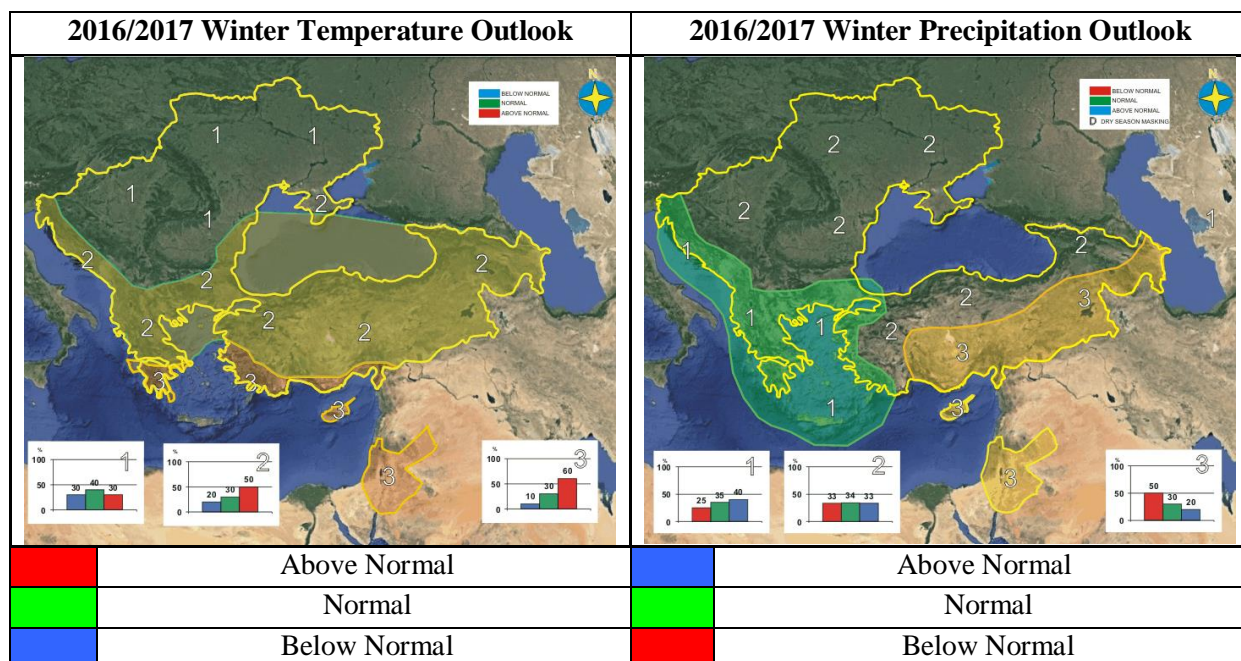


Figure 1. Graphical presentation of the Climate Outlook for the 2016/2017 Winter Season for the SEE Region

ANALYSIS OF WINTER 2016/2017 FOR THE SEE REGION

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

- operational products of the RCC Node-CM (Regional Climate Centre on Climate Monitoring) provides maps for the World Meteorological Organization (WMO) Region VI (Europe and Middle East), http://rcccm.dwd.de/DWD-RCCCM/EN/products/europe/europe_node.html;
- seasonal bulletin on climate in the WMO Region VI for the winter of 2016/2017 (WMO RA VI RCC Node-CM, DWD), <http://www.seevccc.rs/SEECOF/SEECOF-17/STEP-1/Climate-Report-Winter-Season-2016/2017-exp-RCC-CM.pdf>;
- climate monitoring products of the South East European Virtual Climate Change Center – SEEVCCC (Member of the WMO RA VI RCC Node-CM), http://www.seevccc.rs/imgsrc/clim_mon/201702/, and
- national climate monitoring reports of the following SEECOF-16 participating countries: Armenia, Bulgaria, Bosnia and Herzegovina/Federation of Bosnia and Herzegovina, Croatia, Cyprus, Greece, Israel, the Former Yugoslav Republic of Macedonia, Republic of Moldova, Serbia, Slovenia, Turkey and Ukraine (documents available on <http://www.seevccc.rs/SEECOF/SEECOF-17/STEP-1/>)

Winter 2016/2017 in the SEECOF region was mainly characterised by cold spell during December and January. For instance, January was the fourth coldest in Serbia since 1951. Teleconnection indices show negative SCA and positive EA for December, while negative EA with trough over the Balkans and central Mediterranean was in January (Figure 2, upper left). NAO was in a slightly positive phase during winter. On the other hand, climate outlook for 2016/2017 winter suggested negative phase of NAO and some slight predominance of a positive phase for EA and SCA patterns.

Blocking over the eastern Atlantic Ocean, western and north-western Europe dominated during most of January, resulting in advection of cold air in northern and north-eastern flow over the Balkans (Figure 2, right). However, the most probable scenario over the Mediterranean basin with a cyclonic signal in the western part and a high geopotential anomaly over Middle East was predicted in the winter outlook.

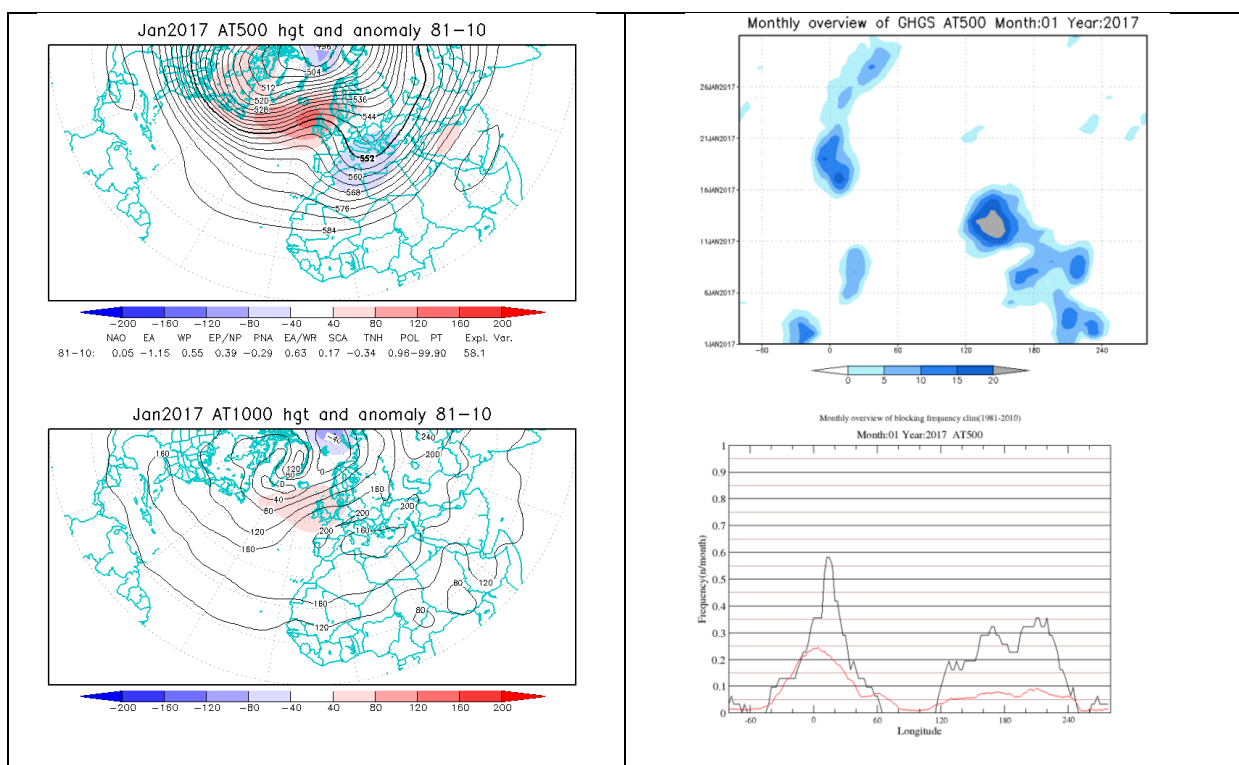


Figure 2. Geopotential height and its anomaly for 500 mb and 1000 mb pressure levels (left), Blocking persistence – duration of pressure difference between 40 N and 60 N (Tibaldi-Monten) (right)

Almost the entire SEECOF region observed below-normal winter temperatures.

Winter temperatures across the lowlands in most of the SEECOF region were mainly in a range between -5°C and 5°C; along the coasts of the Ionian, Aegean, Mediterranean, as well as central and southern Adriatic Sea, in Lebanon, Israel and Jordan, temperatures ranged between 5°C and 15°C. On the other hand, at some high-lying areas in the Carpathian region, eastern Turkey and Armenia winter temperatures ranged between -5°C and -12°C. The winter temperatures are presented in Figures 2 and 3 (left panel).

In most of the SEECOF region anomalies reached up to -2°C below normal relative to the 1961-1990 climatological period. In some parts of central and eastern Turkey, as well as South Caucasus, they were in a range between -2°C and -5°C above normal. The exception to this was observed in the north-western Balkans, Ukraine, Moldova and eastern part of the South Caucasus, where anomalies reached up to 2°C .

In most of the SEECOF region, December conditions were below normal in a range from -1°C to -4°C , relative to the 1961-1990 climatological period. The highest negative anomalies of above -5°C were observed in eastern Turkey.

January was characterized by colder than normal conditions in almost the entire SEECOF region, with the highest negative anomalies reaching -5°C . Positive anomalies, reaching up to 2°C were registered in eastern part of the South Caucasus, some parts of Ukraine, Middle East, central and eastern Turkey. January was the fourth coldest for Serbia and the coldest on record for two stations, three cold spells were registered. In the central and northern regions of Bosnia and Herzegovina, January was the coldest one since 1963. Absolute minimum air temperature (-23.3°C) in Kriva Palanka was observed on January 8th. Two cold spells were recorded in Croatia. The absolute minimum temperature was measured in Dalmatia (in Komiza, Makarska, Split airport and Dubrovnik airport). For some of the monitored stations in Bulgaria, January was the coldest since 1960. In the meteorological station of Macedonia (mainland of the Greece), the minimum and maximum temperature didn't exceed zero for five consecutive days during the period of 7-11 January 2017. Similarly, the station of Larisa observed a similar phenomenon lasting from 7 to 14 January 2017 (eight days). During the above mentioned period the absolute minimum temperatures of -18°C and -9.6°C were observed in Larisa, and Macedonia, respectively. In Cyprus, extreme low temperatures (deviating by 4°C or more from normal) were also recorded mainly between 27th and 30th of January, at all the selected meteorological stations. As an example, note that the lowest daily minimum temperature of -8.4°C (with a normal of 0.7°C) was measured in Prodromos on the 29th of January and the lowest daily minimum temperature of -0.3°C (with a normal of 8.3°C) for Pafos again on the 29th of January.

In February, above normal mean air temperature lingered across most of the SEECOF region, with anomalies up to 4°C in the western Balkans and Carpathian Mountains. Negative anomalies reaching up to -5°C were registered in parts of the South Caucasus, Middle East, central and eastern Turkey.

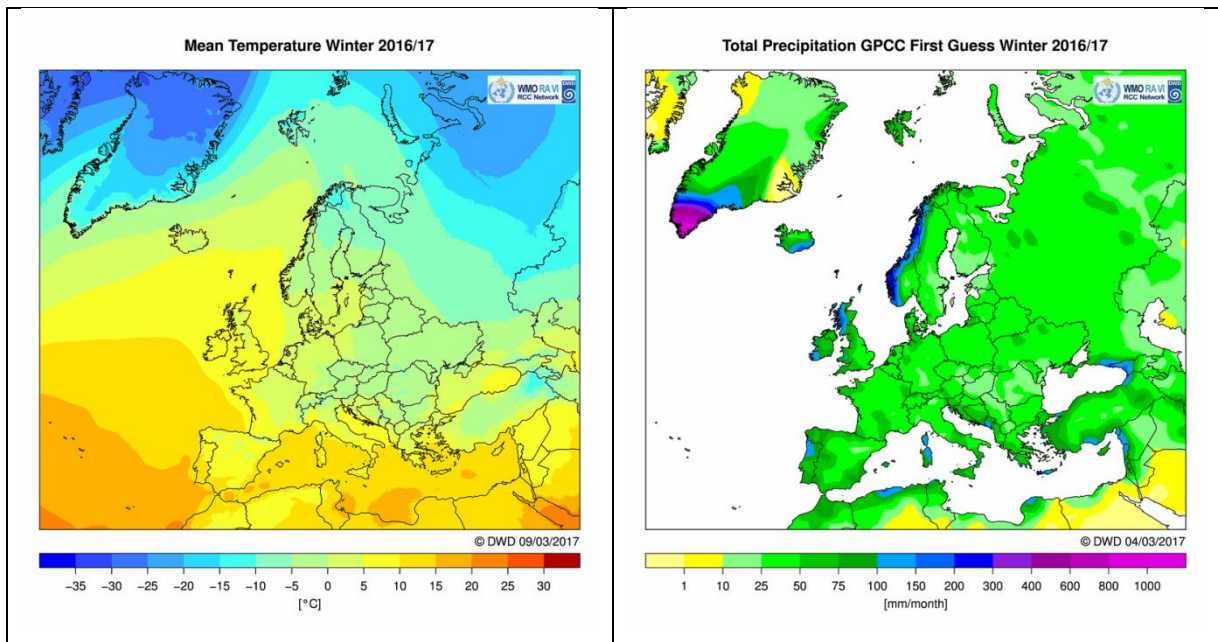


Figure 2. Winter season 2016/2017, Europe – observed temperatures (left panel) and observed precipitation in mm per month (right panel). Source: <http://rcccm.dwd.de>

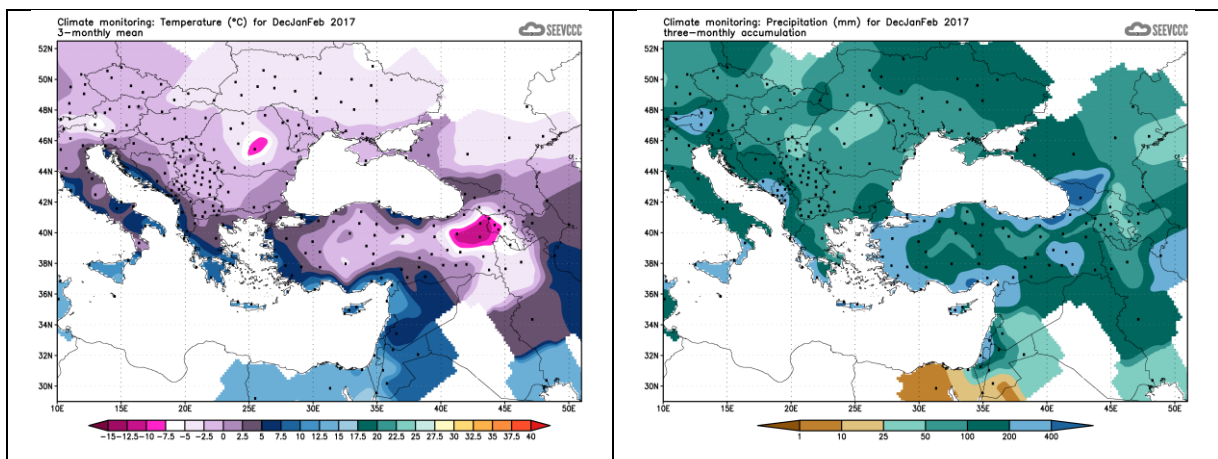


Figure 3. Winter season 2016/2017, SEECOF region – observed temperatures (left panel) and observed precipitation in mm per month (right panel). Source: <http://www.seevccc.rs/?p=6>

The winter precipitation totals, reaching up to 200 mm, were observed in most of the SEECOF region. Seasonal precipitation sums were in a range from 200 mm to 400 mm in the Ionian, southern Adriatic and Aegean Sea, Cyprus, along the coasts of Turkey and Middle East, while Georgia, part of north-eastern Turkey and western Crete received more than 400 mm of precipitation.

Precipitation was characterized by negative anomalies within most of the SEECOF area. It was drier than normal (<75% of the long-term average) in most of the Balkans, southern Ukraine, central parts of Turkey and South Caucasus, as well as southern Jordan. It was wetter than normal (>125% of the long-term average) in certain locations on Crimean Peninsula and the island of Crete. It was averagely wet in some parts of Ukraine, Turkey and Middle East. The winter precipitation anomalies are presented in Figures 4 and 5 (right panel).

During December, it was drier than normal, across the entire Balkans, southern Ukraine, western Turkey and most part of eastern part of the South Caucasus. In the western and southwestern Balkans, as well as southwestern Turkey, it was considerably drier, with the deficits of more than 70 mm. December was extremely dry, driest on record on MS Bihac (Bosnia and Herzegovina). In Serbia December was fourth driest, rainfall was not registered on one station, in some parts of Croatia there was no precipitation at all. By contrast, wetter than normal conditions were registered in southern, eastern and some parts of northern Turkey, northern Ukraine, Crimea, Crete, Cyprus, Georgia, Armenia and Middle East. In Ukraine, very heavy snow (21-24 mm of precipitation fell in 12 hours; snow cover 10-40 cm) was observed on 2nd and 3rd of December in north-east of the country (Kharkiv, Symy, Poltava regions). In Turkey (Anamur), strong storm was observed. Hail was recorded in Cyprus on the 5th, 12th, 13rd, 21st, 28th and 30th of December.

January was drier than normal in the central Balkans, Carpathian region, eastern Georgia, most part of Turkey and Middle East. It was considerably drier, with a relative anomaly below 25% (total sum less than 10 mm) in Romania, central Turkey, Jordan and southern Israel. January precipitation sums were above the average in Greece, eastern Bulgaria and western part of Turkey, with positive anomalies reaching up to 150 mm. The January precipitation sums were within the average in the remainder of the SEECOF region. Very heavy snow (22-45 mm of precipitation fell in 8-12 hours) was observed on 6-7th of January in the south and the north-east parts of Ukraine (Odesa, Mykolayiv, Kherson, Kharkiv regions). In Turkey, snow caused difficulties in transportation for many cities, and the prolonged period of heavy rain caused flood in Mersin.

February was drier in most of the SEECOF region, considerably drier than normal in Cyprus, most of Turkey and some parts of southern Greece, with a relative anomaly below 25% (total sum less than 25 mm). Wetter than normal conditions were observed in the western Balkans, some parts of Carpathian region and southernmost Israel, with relative anomaly reaching up to 200%. High precipitation sums were locally recorded in western Crete (Greece), above the corresponding normal values. In Turkey agricultural areas were affected due to hail in Aydin, in Bodrum heavy rain caused flood.

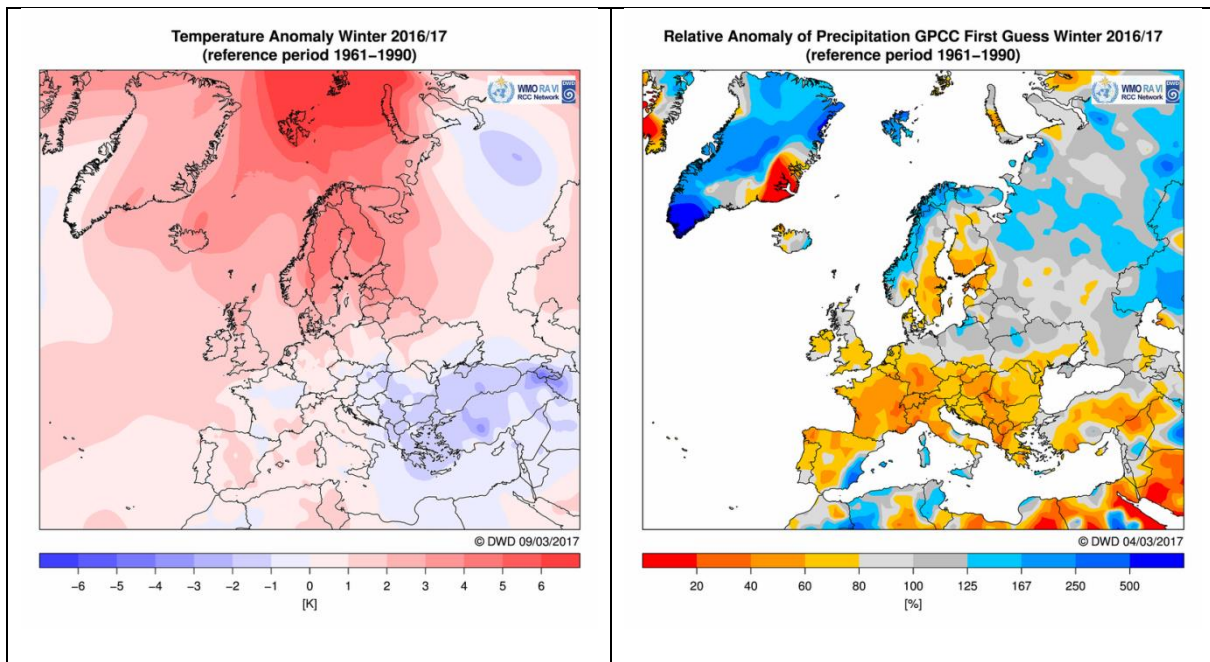


Figure 4. Winter season 2016/2017, Europe – observed temperature anomalies (left panel) and observed precipitation anomalies in percent of 1961-1990 normal (right panel). Source: <http://rcccm.dwd.de>

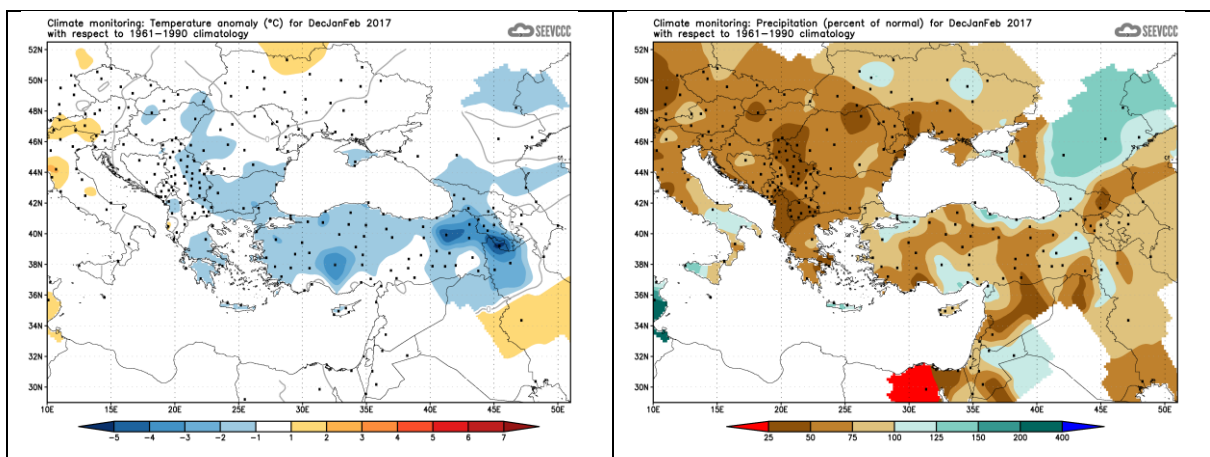


Figure 5. Winter season 2016/2017, SEECOF region – observed temperature anomalies (left panel) and observed precipitation anomalies in percent of 1961-1990 normal (right panel). Source: <http://www.seevccc.rs/?p=6>

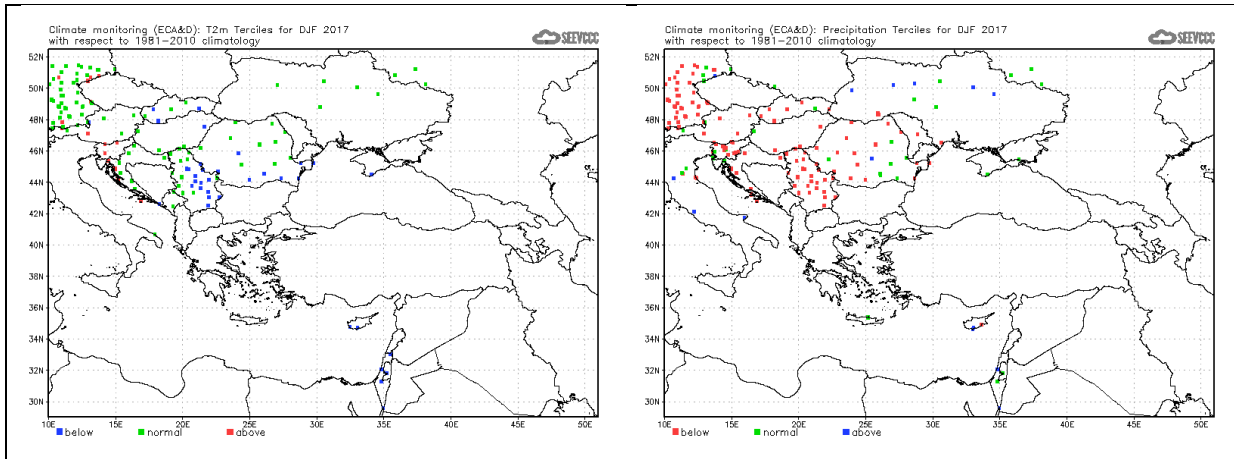


Figure 6. Winter season 2016/2017, SEECOF region – observed temperature (left panel) and precipitation (right panel) terciles in reference to 1981-2010 normal. Source: SEEVCCC

VERIFICATION OF CLIMATE OUTLOOK FOR 2016/2017 WINTER

For most of the SEECOF region, temperature during winter season 2016/2017 was in the below normal category, consequently, the SEECOF-16 Climate Winter Outlook was not accurate. In regard to the winter precipitation anomalies, outlook was correct only for the parts of southern Turkey.

Warmer-than-normal winter was expected in most of the region (zones 2 and 3 in Figure 1), with the positive gradient of probabilities from the north to the south of the region, while in the Pannonian Plain, central parts of the Balkan Peninsula, Carpathian region and Ukraine average winter temperature was favoured. On the basis of the aforementioned regional and sub-regional climate monitoring products, it turned out that the monitored anomalies of the mean winter air temperatures were below normal in most of the SEECOF region, which means that the climate outlook for the winter air temperature was not accurate (zones 2 and 3 in Figure 1). The winter temperature predictions were correct for northern Ukraine, where anomalies were within average.

According to the SEECOF-16 Outlook, it was predicted that the uncertainties in regional predictions would be higher for precipitation than for temperature. It was outlined, that a wetter-than-normal (zone 1 in Figure 2) winter was favoured along the costs and its hinterland of Adriatic, Ionian and Aegean Sea, where outlook was not accurate. Drier-than-normal winter was predicted for Eastern Mediterranean, Israel, Jordan, southern and south-eastern parts of Turkey, eastern and south part of South Caucasus region (zone 3 in Figure 2). Winter outlook was correct for most of the zone 3. In the remainder of the region, equal chances for below-, near-, or above-normal conditions (zone 2 in Figure 2) were predicted.

NOTE: Detailed analysis, along with the extreme weather events is going to be done after receiving national reports.

APPENDIX A: Contributions to Step 1 of SEECOF-17

- World Meteorological Organization
- Met Office, United Kingdom
- International Research Institute for Climate and Society, United States of America
- European Center for Medium Range Weather Forecast
- Meteo France, Republic of France
- Federal Service for Hydrometeorology and Environmental Monitoring, Russian Federation
- Deutscher Wetterdienst, Federal Republic of Germany
- National Centers for Environmental Prediction, United States of America
- South East European Virtual Climate Change Center hosted by Republic Hydrometeorological Service of Serbia, Republic of Serbia
- Armenian State Hydrometeorological and Monitoring Service, Republic of Armenia
- National Institute of Meteorology and Hydrology, Republic of Bulgaria
- Meteorological and Hydrological Service, Republic of Croatia
- Hellenic National Meteorological Service, Greece
- Meteorological Service, the Republic of Cyprus
- Israel Meteorological Service, State of Israel
- Republic Hydrometeorological Institute, Former Yugoslav Republic of Macedonia
- State Hydrometeorological Service, Republic of Moldova
- Federal Hydrometeorological Service of the Federation of Bosnia and Herzegovina, Federation of Bosnia and Herzegovina, Bosnia and Herzegovina
- Republic Hydrometeorological Service of Serbia, Republic of Serbia
- Environmental Agency of the Republic of Slovenia, Republic of Slovenia
- Turkish State Meteorological Service, Republic of Turkey
- Ukrainian Hydrometeorological Center, Ukraine

APPENDIX B: Analysis and verification of the SEECOF-16 climate outlook for the winter season 2016/2017:

Verification summary based on the national reports and contributions of the participants of the SEECOF-17 online meeting

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)		High Impact Events
	Observed	SEECOF-16 climate outlook for temperature	Observed	SEECOF-16 climate outlook for precipitation	
Armenia (1)	Below normal (Ararat valley extremely low)	Above normal	Below Normal	Weak indication	It was the longest foggy winter in Armenia, especially in Ararat valley, dense fog with visibility $\leq 50\text{m}$ was observed throughout the entire winter. Heavy snowfall was observed on 14 th of December in Tavush region and 28 th of January in Sjunik Region. Strong wind with the gusts of 29 m/sec was observed in Gekharqunik and Lori regions.
Bulgaria (1)	Below normal	Near normal	Near or below normal	Near or above normal	December 2016 was very dry. January 2017 was very cold. For some of the monitored stations it was the coldest January since 1960. There was a very significant snow event, lasting from 6 th to 11 th January 2017, resulting with a significant snow cover in the entire country. If compared to a similar snow events from the last five years, it appears to be the most important recent snow event. The same period was also extremely cold. It ranks as the 4 th among the coldest 5-day periods since 1991. However, in terms of apparent temperature it is the coldest period. The reason is that the low temperatures were accompanied by strong winds and cloudy conditions. The same winds and cloudiness however prevented minimum temperatures from exceeding the absolute minimums for January.
Federation of Bosnia and Herzegovina (1)	Below normal in almost entire Bosnia and Herzegovina	Near-normal (30, 40, 30) Central and northern regions Above-normal (20, 30, 50) Southern regions	Below normal in entire Bosnia and Herzegovina	No predictive signal (33, 34, 33) Central and northern regions Above normal (25, 35, 40) Southern regions	The winter ranks as the fourth coldest in the central and northern regions and the seventh in the Southern region in the 21 st century. December was extremely dry, driest on record on MS Bihac. January ranked as the coldest in the central and northern regions since 1963, and in the south and the west regions since 1985. The lowest temperature was measured on Bjelasnica amounting to -27.2°C (January, 7 th).

<p>Croatia (5)</p>	<p>Normal</p>	<p>Above normal at the Adriatic coast, interior of Dalmatia and mountain region (Gorski kotar and Lika)</p> <p>Normal (remaining part of Croatia)</p>	<p>Normal (part of the Northern Adriatic, the wider area of the town of Knin, part of the Southern Adriatic as well as Eastern Croatia)</p> <p>Below normal (in the remaining part of Croatia)</p>	<p>Normal or above normal (the Adriatic coast and its hinterland and mountainous part of Croatia)</p> <p>No predictive signal (North and East part of Croatia)</p>	<p>December 2016 was extremely dry. In some parts of Croatia there was no precipitation at all (for example Dubrovnik). Extreme weather conditions in January 2017 are marked by low temperature and strong wind. According to percentile ranks and classification ratings, thermal conditions in Croatia for January 2017 fall under the category cold, very cold and extremely cold. Some absolute minimum temperature was measured in Dalmatia (in Komiža, Makarska, Split airport and Dubrovnik airport). Two cold spells were recorded – from 3rd to 8th and from 15th to 19th. The coldest days were 7th and 8th. Together with gale force bora (NE wind) low temperature caused a lot of damages in the water supply system in Dalmatia and a lot of traffic interruptions. At some parts along the coast the sea was frozen.</p> <p>February 2017 was warmer than normal and especially at the North Adriatic wetter than normal (wider area of Rijeka was extremely wet). High impact weather was not recorded.</p>
<p>Cyprus (5)</p>	<p>December: Below normal</p> <p>January: Colder than normal</p> <p>February: Normal and slightly colder than normal</p>	<p>Above normal</p>	<p>December: Well above normal</p> <p>January: Inland and over the southern and eastern coasts below normal but above to well above normal over all other areas</p> <p>February: Well below normal</p>	<p>Below 20% above normal 35% around normal 45% below normal</p>	<p>December: Extremes (deviating by 4°C or more from normal) were recorded mainly between 14th and 25th of December, at all the selected meteorological stations. The recorded maximum of 8.6°C (with a normal of 18°C) for Polis was measured on the 19th of December and the maximum of 8.5°C (with a normal of 18°C) for Achna on the 17th of December. Concerning the mean daily minimum temperatures, note that the recorded minimum of -6.1°C (with a normal of 2.6°C) for Prodromos was measured on the 19th of December and the minimum of -0.5°C (with a normal of 8.3°C) for Achna on the 15th of December. Regarding the accumulated precipitation, December recorded a mean area average of 150,6 mm (160% of normal). Hail was recorded on the 5th, 12th, 13rd, 21st, 28th and 3th of December. It is worth mentioning that there were 18 days with snow during December, and on the 21th of December, 21cm of new snow on Troodos square.</p> <p>January: Extremely high temperatures were recorded, as an example Polis Chrysochous recorded a highest daily maximum of 20.9°C (with the normal being 16.3°C). Extremely low temperatures (deviating by 4°C or more from normal)</p>

					<p>were also recorded mainly between 27th and 30th of January, at all the selected meteorological stations. As an example, note that the lowest daily minimum temperature of -8.4°C (with a normal of 0.7°C) for Prodromos was measured on the 29th of January and the lowest daily minimum temperature of -0.3°C (with a normal of 8.3°C) for Pafos again on the 29th of January. Concerning the daily maximum temperatures during 27th and 30th of January, note that the lowest daily maximum of -2.9°C (with a normal of 6.3°C) for Prodromos was measured on the 28th of January and the lowest daily maximum of 7.9°C (with a normal of 16.3°C) for Achna again on the 28th of January.</p> <p>Regarding the accumulated precipitation, January recorded a mean area average of 64 mm or 77% of month's normal.</p> <p>Hail was recorded on the 1st, 2nd, 8th, 10th and 27th of January. It is worth mentioning that, there were 14 days with snow during January, on the 10th and on the 27th of January, 15 cm of new snow on Troodos mountains.</p> <p>February: Extremely high temperatures were recorded at all the selected meteorological stations, mainly on 28th of February, like Pafos airport that recorded a highest daily maximum of 26.6°C (with the normal being 17.1°C). Extremely low temperatures (deviating by 4°C or more from normal) were also recorded.</p> <p>The lowest daily minimum temperatures for Larnaka airport and Athalassa on the 1st of February were -0.1°C (with a normal of 7.1°C) and -1.7°C (with a normal of 5.3°C), respectively.</p> <p>Regarding the accumulated precipitation, February recorded a mean area average of only 8 mm or 12% of normal.</p> <p>Hail was recorded on the 9th, 11th, 12th, 13th and 22nd of February. It is worth mentioning that, there were 6 days with snow during February, on the 12th of February, 9 cm of new snow on Troodos square.</p>
Greece (2)	Below normal	Above normal	drier than normal, wetter than normal in Crete	Below normal (25) Normal (35) Above normal (40)	<p>December 2017 was a very dry month</p> <p>In January 2017, an extreme weather/climate event, relative to total frost, was observed particularly in the first half of this month in Greek mainland (mainly north and central). A total frost event was recorded with its duration of five or more consecutive days. A representative case of this event is the meteorological station of Macedonia where the minimum and maximum temperature remained constantly below zero for five</p>

					consecutive days during the period from 7-11 th January 2017. Similarly, the station of Larisa observed a similar phenomenon with greater severity. It lasted longer, from 7 th to 14 th January 2017 (eight days) and larger magnitude of total frost was observed (highest minimum temperatures: -18°C in Larisa as opposed to -9.6°C in Macedonia). Never before have the two phenomena been observed in these areas and generally in Greece. Furthermore, in February 2017 , high precipitation totals were locally recorded in western Crete, above the corresponding normal values. It is indicative that, the accumulated monthly precipitation for February 2017 was 148 mm from Met. Station Souda /HNMS (Hellenic National meteorological Service – HNMS, www.hnms.gr) and 133.0 mm from W.S Vryssai /NOA (W.S: weather station, National Observatory of Athens, www.noa.gr). The corresponding mean value for monthly precipitation for Souda (HNMS) in February is 112.8 mm. Thus, February 2017 was a wet month for western Crete, since the monthly precipitation of this particular month accounted for 131% of normal values.
Israel (5)	Below normal	60% above normal 30% around normal 10% below normal	Above normal	20% above normal 35% around normal 45% below normal	No high impact events in winter 2016/17.
Republic of Macedonia (5)	Below normal	Normal (30,40,30) West part – warmer than normal (20,30,50)	Below normal	No signal (33,34,33) West part – wetter than normal (25,35,40)	December 2016 Insignificant amounts of precipitation January 2017 Extremely cold; Absolute minimal temperature of -23.3°C was measured in Kriva Palanka on 8 th . Historical values exceeded for this month. Heavy snow fall. February 2017 Unusually high air temperatures Insignificant amounts of precipitations and no snowfall.
Moldova (5)	Near normal	Near normal	Below or near normal	Below or near normal	On January 7 th , an extreme meteorological phenomenon was observed in the form of a strong wind: the maximum speed of wind at MS Leova reached 26 m/s. Blizzard was observed in the first decade of January, resulting with snowdrifts on the roads, which created extremely unfavourable conditions for traffic. During the winter period, fogs, icy-frost deposits with a diameter of 1-12 mm, snowstorms, ice on the roads were observed.

<p>Serbia (1,5)</p>	<p>Below normal in almost entire Serbia</p>	<p>Near-normal (30, 40, 30) in entire Serbia</p>	<p>Below normal in entire Serbia</p>	<p>No predictive signal (33, 34, 33) in entire Serbia</p>	<p>Winter of 2016/2017 was the 4th driest and 12th coldest for Serbia; 4 cold waves; the longest during first half of January in almost entire Serbia; The number of ice and frost days and days with severe frost was surpassed; Cold and extremely dry December; driest on record at two stations; rainfall was not registered on one station; fourth driest in Serbia; January 2017 was the fourth coldest for Serbia and the coldest on record for two stations; number of ice days was surpassed at three stations; number of frost days and days with snow cover was exceeded at most meteorological stations; Kopaonik mountain observed lowest daily minimum air temperature on record; Three cold waves; during the first cold wave, daily minimum air temperature difference from the mean daily minimum air temperature reached -20.4°C.</p>
<p>Slovenia (5)</p>	<p>western Slovenia: normal, above normal in some parts in north-west eastern Slovenia: below-normal</p>	<p>western Slovenia: warmer than normal eastern Slovenia: near-normal</p>	<p>western Slovenia: normal in the south-west, below normal in northwest</p>	<p>eastern Slovenia: below-normal western Slovenia: wetter than normal eastern Slovenia: no clear signal</p>	<p>No high impact events in winter 2016/17.</p>
<p>Turkey (5)</p>	<p>Normal and below normal</p>	<p>20% below normal, 30% normal, 50% above normal (in the whole)</p>	<p>Above normal (mostly in the north coast)</p>	<p>25% below normal, 35% normal and 40% above normal (in the west coast)</p>	<p>In December 2016, strong storm caused financial damage on the houses and greenhouses in Anamur. Due to snow in Çanakkale, Çorum, Bilecik, Nevşehir, Ardahan, Artvin and Karaman, transportation was affected. In January 2017, snow caused difficulties in transportation in many cities. The prolonged period of heavy rain caused flood in Mersin.</p>

	(Below normal in the east, west and northwestern part of the country.)	country except west coast and south west coast) 10% below normal, 30% normal, 60% above normal (in west coast and southwest coast)	Below normal (in most of the country especially inland)	33% below normal, 34% normal and 33% above normal (mostly in the northern half of the country except the west coast) 45% below normal, 35% around normal and 20% above normal (in the southern half of the country except the southwest part)	In February 2017 , agricultural areas were affected due to hail in Aydn. Heavy rain caused flood in Bodrum. In Aksaray, frost caused transportation difficulties. In Bingöl, one person lost his life due to storm.
Ukraine (1,5)	Normal (46%) and cold (54%)	Near-normal (30, 40, 30) in entire Ukraine	Normal (46%) Below normal (27%) above normal (27%)	No predictive signal (33, 34, 33) in entire Ukraine	In December meteorological extraordinary phenomena in the form of very heavy snow (21-24 mm of precipitation fell in 12 hours; snow cover 10-40 sm) was observed on 2-3 th of December in north-east of the country (Kharkiv, Symy, Poltava regions). In January meteorological extraordinary phenomena in the form of very heavy snow (22-45 mm of precipitation fell in 8-12 hours) was observed on 6-7 th of January in the south and the north-east parts of country (Odesa, Mykolayiv, Kherson, Kharkiv regions). Snowfall was accompanied by strong blizzards (wind speed 15-24 m/s during 14-24 hours, in Ust-Danaysk (Odessa region) wind speed was 25 m/s), snowdrifts were formed. Unfavorable weather conditions caused power outage, and disruptions in telecommunications, utilities and a transport. In February strong wind was recorded in west of the contry (wind speed 25 m/s in Lviv, Ivano-Frankivsk regions on 24 th of February and on 28 th wind speed 40 m/c in the Carpathian highlands)

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