



**Third Session of  
SOUTHEASTERN EUROPE CLIMATE OUTLOOK FORUM**

**SEECOF-3 ON-LINE MEETING  
April-May 2010**

**ANALYSIS AND VERIFICATION OF SEECOF-2 CLIMATE OUTLOOK  
FOR 2009-10 WINTER SEASON FOR SOUTH-EAST EUROPE (SEE)**

**CLIMATE OUTLOOK FOR 2009-2010 WINTER SEASON FOR SEE REGION**

As stated in the SEECOF-2 Seasonal Climate Outlook for 2009-10 Winter over Southeastern Europe Consensus Statement (document [http://www.wmo.int/pages/prog/dra/eur/documents/SEECOF-3/SEECOF-2\\_Consensus\\_statement.pdf](http://www.wmo.int/pages/prog/dra/eur/documents/SEECOF-3/SEECOF-2_Consensus_statement.pdf)) “warmer winter is expected over Southeastern Europe and South Caucasian region in 2009-10. Reliable forecasts of winter precipitation are not available at this time, but the northwestern parts of the sub-region have a slightly enhanced likelihood of above-normal precipitation”. Climate outlook for 2009-10 winter season for SEE region is presented in Figure 1.

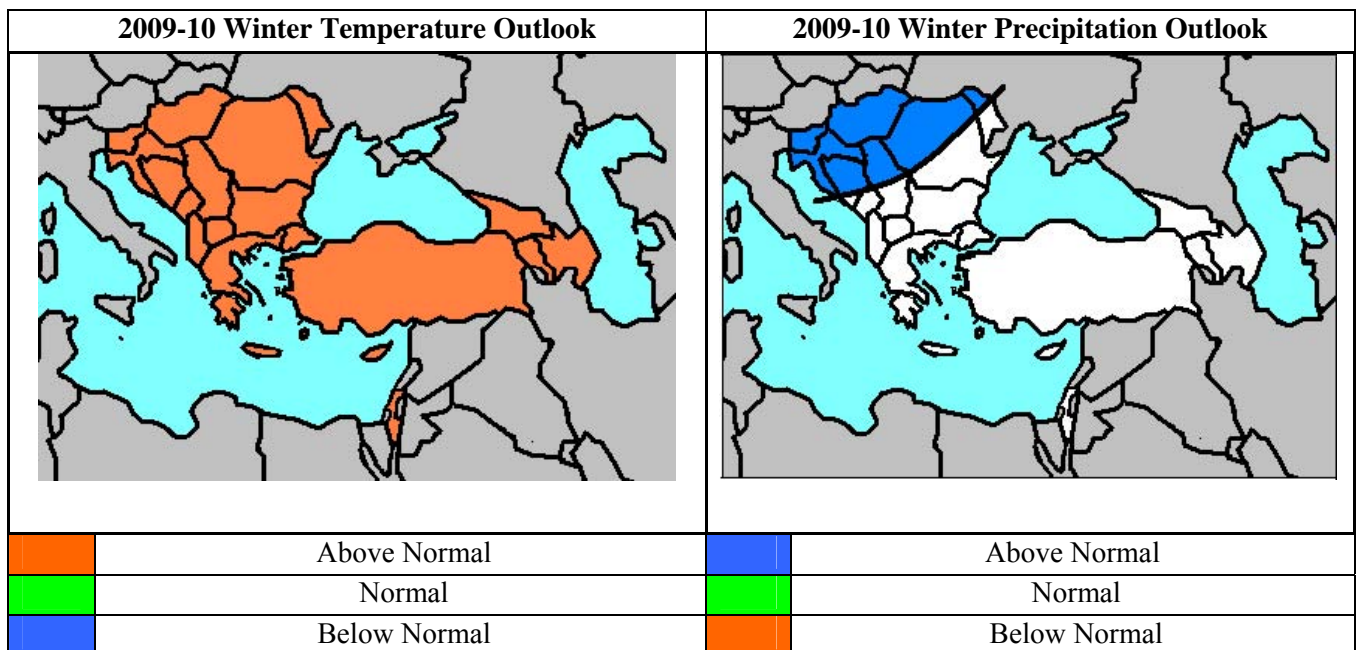


Figure 1. Graphical presentation of climate outlook for 2009-10 winter season for the SEE region

## SHORT ANALYSIS OF THE 2009-10 WINTER SEASON FOR SEE REGION

Analyses of the winter 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, Lead of the WMO RA VI Pilot RCC Node on Climate Monitoring, <http://www.dwd.de/ecsm>),
- 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/MONITORING-SEECOF-III>), and
- national climate monitoring reports of the following SEECOF-3 participating countries: Albania, Armenia, Azerbaijan Republic, Bulgaria, Croatia, Cyprus, Georgia, Greece, Hungary, Israel, FYR of Macedonia, Republic of Moldova, Montenegro, Slovenia, Serbia and Turkey (documents available from <http://www.seevccc.rs/SEECOF-III/Step%201/>).

Warmer winter (above-normal range) was observed in the Carpathian region (western parts of Romania), in the southern parts of the Dinaric Alps, Serbia, FYR of Macedonia, in the Aegean Sea, in the southern and eastern parts of the Black Sea, in Turkey, Israel and in the Caucasian region. In other parts of the SEE region winter temperatures were within normal range. Only in the Republic of Moldova (eastern part of the Carpathian region) winter season temperature was below normal range. In the southeastern parts of Serbia winter season temperature was very to extremely hot. Winter season temperature anomalies are presented in Figure 2 (left panel).

Wet winter was observed in the greater parts of SEE region (very wet in Cyprus and almost the whole territory of Croatia, Montenegro and most parts of Serbia, and extremely wet in some parts of mountainous hinterland of the Adriatic Sea as well as in central and eastern Serbia). In the eastern parts of Armenia and Israel winter precipitations were within normal range. Winter season precipitation anomalies are presented in Figure 2 (right panel).

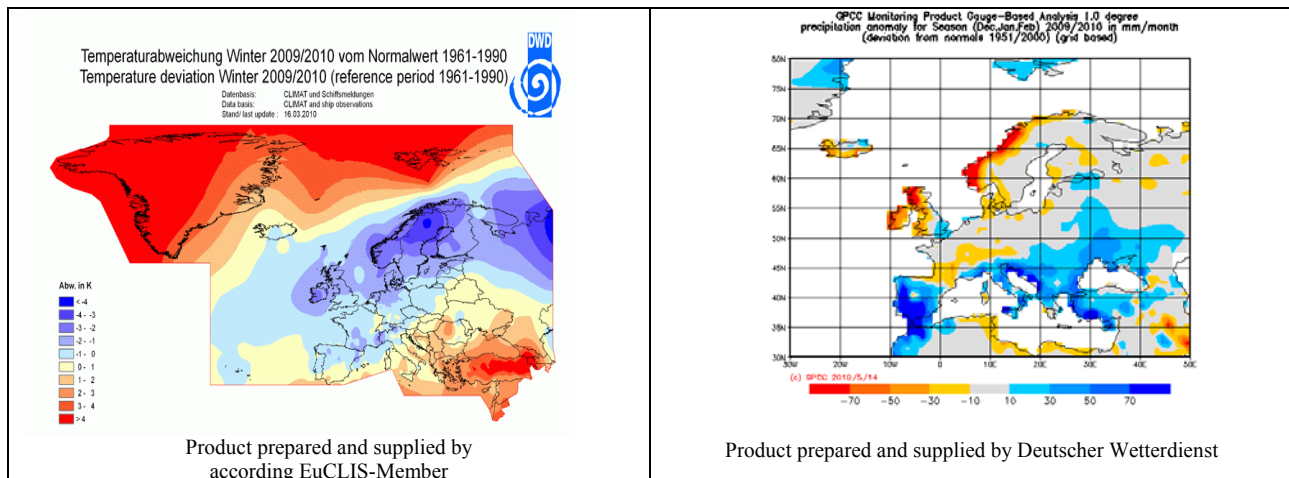


Figure 2 Winter season 2009-10 observed temperature anomalies (left panel) and winter season observed precipitation anomalies in mm per month (right panel). Source: <http://www.dwd.de/ecsm>

## VERIFICATION OF CLIMATE OUTLOOK FOR 2009-2010 WINTER SEASON

On the basis of aforementioned regional, subregional and national climate monitoring products it appears that climate outlook for 2009-2010 winter season temperature was correct for the Carpathian region (western parts of Romania), in the southern parts of the Dinaric Alps, in the FYR of Macedonia, in the Aegean Sea, in the southern and eastern parts of the Black Sea, in Turkey and in the southern parts of the Caucasian region. In the rest, smaller part of the SEE region, climate outlook for winter season temperature was less satisfactory.

Outlook of the winter season precipitation was correct for western parts of the Balkan peninsula (especially in the north part of the Dinaric Alps) and in the Pannonian plain. The SEECOF-2 was unable to predict winter season precipitations above-normal in the FYR of Macedonia, northern and central parts of Greece, eastern and northern coasts of the Black Sea, along the western coasts (mountainous region) of the Caucasian region and on eastern coasts of the Aegean Sea.

## RECOMMENDATIONS FOR FURTHER ACTION IN SUPPORT TO SEECOFs

As the result of the work on the verification of SEECOF 2 climate outlook, SEECOF-3 meeting found that there is the need for development of standard template providing guidance for national reports related to climate outlook verification, including guidance on using 30 year reference period (climatological normals) as well as criteria for “high impact events”.

## **APPENDIX A: Contributions to Step 1 of SEECOF-3**

World Meteorological Organization  
Federal Service for Hydrometeorology and Environmental Monitoring, Russian Federation  
Meteo France, Republic of France  
Deutscher Wetterdienst, Federal Republic of Germany  
South East European Virtual Climate Change Center hosted by Republic Hydrometeorological Service of Serbia, Republic of Serbia  
Royal Netherlands Meteorological Institute, The Netherlands  
Institute for Energy, Water and Environment, Republic of Albania  
Armenian State Hydrometeorological and Monitoring Service, Republic of Armenia  
National Hydrometeorological Department, Republic of Azerbaijan  
National Institute of Meteorology and Hydrology, Republic of Bulgaria  
Meteorological and Hydrological Service, Republic of Croatia  
Hellenic National Meteorological Service, Greece  
Meteorological Service, Republic of Cyprus  
Department of Hydrometeorology, Georgia  
Meteorological Service of the Republic of Hungary, Republic of Hungary  
Israel Meteorological Service, State of Israel  
Republic Hydrometeorological Institute, Former Yugoslav Republic of Macedonia  
State Hydrometeorological Service, Republic of Moldova  
Hydrometeorological Institute of Montenegro, Montenegro  
Republic Hydrometeorological Service of Serbia, Republic of Serbia  
Meteorological Office, Republic of Slovenia  
Turkish State Meteorological Service, Republic of Turkey

**APPENDIX B: Analysis and verification of SEECOF-2 climate outlook for the winter season 2009-10:**

Verification summary based on national reports and contributions of the participants of SEECOF-3 on-line meeting

(also available on: <http://www.wmo.int/pages/prog/dra/eur/SEECOF-3-page4.php> )

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)		High Impact Events
	Observed	SEECOF-2 climate outlook for temperature	Observed	SEECOF-2 climate outlook for precipitation	
Albania (1)	Above normal	Above normal	Above normal	Not reliable forecast.	At the beginning of January larger flooding downstream of the Drini River. Severe river flooding in February in the northern part of Albania.
Armenia (1)	Above normal	Above normal	It is difficult to evaluate. Within normal range in eastern parts; in some regions above normal.	Not reliable forecast.	Winter 2009-2010 in Armenia was extremely warm, it was ranked as the third extremely warm winter during the whole period of observations.
Azerbaijan Republic (5)	Above and near normal	Above normal	There is no estimation for winter season precipitation.	Not reliable forecast	At the end of January and in the first decade of February, cold and wet period with snow, heavy rain and strong wind.
Bosnia & Herzegovina		Above normal		Above normal	
Bulgaria (1)	Within normal range.	Above normal	Above normal to normal	Not reliable forecast.	No comments for high impact events.
Croatia (1)	Within normal range.	Above normal	In the whole country above normal. In the northern part above normal (wet), in the	Slightly above normal.	Flood events in mountainous part of Lika and Gorski kotar area. Deep snow conditions in the whole continental and mountainous part of

			Adriatic area considerably above normal (very wet), in mountainous region extremely wet.		the country.
Cyprus (1)	Above normal	Above normal	Considerably above normal.	Not reliable forecast.	On December 16 <sup>th</sup> heavy rain, hail associated with strong wind affected all areas of Cyprus resulting in uprooted trees and house damages. On January 18 <sup>th</sup> intense rainfall was recorded over inland area causing severe problems. On January 31 <sup>st</sup> tornado was recorded in southern coastal region causing local damages. On February 27 <sup>th</sup> heavy rainfall accompanied in some cases with strong wind, lightning and thunders. In region of Troodos mountainous tornado was recorded.
Georgia (3)	Above normal	Above normal	There is no estimation for winter season precipitation.	Not reliable forecast.	On December 15 <sup>th</sup> in the most regions of the east Georgia whirlwind made damage to the population. On February 22 <sup>nd</sup> heavy precipitation with strong wind was observed damaging several buildings.
Greece (5)	Above normal (0.5 to 1.0°C).	Above normal	Some positive anomaly in the central and north-eastern Greece, not firm assessment.	Not reliable forecast.	Warmest December in the last 10 years. Extremely hot on New Year's day with maximum temperatures in several parts of the central-south Greece were close to corresponding highest values

					recorded in the last 50 years. On January 17-18 heavy rainfall and thunderstorms were observed mainly in Crete causing flash floods.
Hungary (1)	Above normal	Above normal	More than normal.	Above normal	The country-wide mean temperature on December 20 <sup>th</sup> was the lowest, only -10.9°C, and its maximum, 11.5°C, occurred 5 days later. In the warming period some daily records were surpassed: we registered 18.5°C on 23 <sup>th</sup> , 21.8°C on 25 <sup>th</sup> and 18.3°C on 26 <sup>th</sup> as daily maximum temperature. All these three values were measured at the station Sellye. During the high temperature range potholes formed on the roads, which made the traffic more difficult. The large amount of snow of mid- December melted away rapidly in the unusually robust warming. It caused flooding on northern Hungarian rivers.
Israel (4)	Above normal	Above normal	Within normal range.	Not reliable forecast.	Winter was the hottest one since the beginning of the history of measurements. Heat wave during February. In many stations, measured temperature was the second or the third highest registered for this month. The duration of hot days sequence was the longest registered ever since the beginning of the measurements. Severe Flooding Event in southern Israel happened between January 17 <sup>th</sup>

					and 21 <sup>st</sup> . The rain was exceptional both in the amounts measured in different stations as well as in its extent.
FYR of Macedonia (1,2)	Above normal	Above normal	Above normal	Not reliable forecast.	No comments for high impact events.
Republic of Moldova (3)	Below normal	Above normal	Above normal	In southern-western parts of the country - above normal; in other parts forecast is not reliable.	<p>The absolute minimum of the air temperature for the season on the territory was -31,0°C (January, MS Balti), that occurs in average once in 25 years.</p> <p>The third decade of January was the coldest, the average air temperature was -10°C and -15°C, that is 6,5 – 10,5°C below normal, and in winter time, it occurs in average once in 5 – 7 years.</p> <p>The amount of precipitation for the season on the territory was mainly 170 - 260 mm (or 180-280% of the norm), that occurs in average once in 20-30 years.</p> <p>Between 22<sup>nd</sup> and 28<sup>th</sup> of January the entire territory of the Republic Moldova had very cold weather. Low temperatures created critical conditions for overwintering of the major crops and damages.</p>
Montenegro (1)	Above normal. In the northeastern parts of country considerably above	Above normal	Above normal	Forecast is not reliable.	February -high intensity of rainfall in the beginning of the month, therefore within 10 days the rainfall amount was



	normal.				<p>from 60% to 80% of total average precipitation in this month. For example the rainfall on Zabljak within 14 days was + 7% higher than average for whole month.</p> <p>-intensive cold wave from North Europe affected Montenegro. From 10<sup>th</sup> to 16<sup>th</sup> February temperature was considerably below the average in the whole State for this part of the year. As the consequences – several days with T below 0<sup>0</sup>C in the northern part and with the weak snowfall. In the northern part very cold with strong NE wind up to 50 km/h of wind gust.</p> <p>Heavy rainfall in December 2009 and January 2010 caused floods in southern part, i.e. surroundings of the Skadar Lake and the river Bojana</p>
Romania		Above normal		In northern-northeastern parts of the country above normal.	
Slovenia (1)	Above normal	Above normal	Above normal	Above normal	No comments for high impact events in English language
Serbia (1)	Northern and eastern parts of the country were within normal range, central parts in the category of hot and southeastern parts in the category of very hot and extremely hot.	Above normal	In southern and southwestern parts of Serbia wet, in major parts very wet.	In major parts of Serbia above normal, in southern parts not reliable forecast.	<p>It was extremely wet in river basins of the Timok and Great Morava</p> <p>In eastern Serbia, the highest water levels in the history of the observation were observed at the end of December and between 20<sup>th</sup> to 22<sup>nd</sup> February and they caused flooding and jeopardizing of people and material goods. Floods with damage to agricultural soil also</p>

					occurred in western Serbia. In Belgrade, on February 25 <sup>th</sup> 2010, the previous February daily precipitation maximum of measured 39.1 mm was surpassed
Turkey (2)	Above normal	Above normal	Above normal	Not reliable forecast	In most parts of Turkey - the third warmest winter season on record.

Note:

- 1 - Basic climatological period (1961-1990)
- 2 - Basic climatological period (1971-2000)
- 3 - Basic climatological period (1951-2000)
- 4 - Basic climatological period (1981-2000)
- 5 – No information about basic climatological period