

Annex

Country: ARMENIA

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Assessment of the seasonal forecast for the winter season

DJF 2013-14

In the following analysis, the Climatic Normal consists of the 1961 to 1990 year mean.

There was no clear signal for the average temperature during the cold season according to the consensus statement of November 2013 in Armenia (Zone 1).

The actual data for the season average temperature in Armenia was near the norm but below by 1-2 degrees in Ararat Valley.

Observed temperatures in December were very cold. The temperature was below the norm by 2-5 degrees; Ararat Valley 7-8 degrees. In January the temperatures were above norms by 1-2 degrees, though Ararat valley was below the norm by 1-2 degrees. In February, temperatures were higher than the norm by 1-3 degrees.

Verifying MEDCOF temperature outlook, the seasonal forecast for mean temperature was not expressed properly for Armenia.

The consensus statement of November 2013 regarding Armenia (zone 3) has equal percentages for below, equal to, or above normal accumulated precipitation. The actual rainfall data was less than the norms for the entire country during the winter season. In December reached 36-91% of its normal. In January and February reached 3-70% of its normal (in some areas in January; 120%). Only in separate stations exceeded the normal: 105-210%.

Verifying precipitation outlook, the seasonal forecast failed to forecast a dry season for Armenia.

Analysis of the 2013-14 winter season:

Temperature

December: December is listed as a coldest December in Ararat Valley since 1901 with the average monthly air temperatures in the foothills of Ararat valley: -8 ... -9°C , and in Ararat valley -6 ... -7°C . The temperature throughout the country was below normal by 2-10 degrees.

Observed average monthly air temperatures in mountainous regions: -5... - 14°C, in the foothills: - 2...

- 8⁰C, in the foothills of Ararat valley: -8 ... -9⁰C, in the northern lowlands: ... 0 - 1⁰C, and in Ararat valley -6 ... -7⁰C.

At the beginning of December (1-3) the highest maximum temperature was observed; mountainous regions: +2 ... +9⁰C, in the foothills: +6 .. +15⁰C, in lowland areas: 7 .. +15⁰C.

The lowest minimum and maximum air temperature was observed during the 25th-31st of December in the Ararat Valley and surrounding foothills. There was no significant difference in day and night time temperatures during this period. The night air temperatures dropped to -19 ... -22⁰C in Ararat Valley, - 24⁰C in Gyumri. The day time temperatures did not rise above -10 ... -14⁰C. The average daily temperature during this period was below normal by 13-16 degrees.

January: Average monthly temperatures in most parts of Armenia were above the normal temperatures by 2-3 degrees, except Ararat Valley; observed 1-1.5 degree below normal. The mean monthly temperature in the northern lowlands observed +0.6 ... 2.5⁰C, in the southern lowland +0.9... + 1.1 ⁰C, in Ararat valley -4.1 ... -4.5⁰C, in the foothills -1.0 ... -3.1⁰C, and in the highlands -2.9 ... -10.2⁰C.

The coldest days were in the first and second decades of the month when the temperatures in mountainous areas fell to -22 ... - 27⁰C (-28 ...- 30⁰C in Ashotsq), in the foothills -11 ... - 18⁰C , in the northern lowlands -8 ... - 10⁰C, and in Ararat Valley -16 ... - 18⁰C . By the end of the month (third decade) the mean daily temperature was above normal temperatures by 5-10 degrees.

February : Average monthly temperature in most parts of Armenia were above the normal by 1-4 degrees and in other regions, temperatures remained near normal; in mountainous regions -3 ... - 8⁰C , in the foothills -3 ... +2⁰C, and in the lowlands +1 ... +4⁰C.

The lowest temperature recorded in the first decade was the 3rd - 6th of February. Minimum temperatures in northern mountains and foothill areas dropped to -25 ... - 30⁰C (Ashotsq reached - 39⁰C), Ararat Valley dropped to -12 ... - 14⁰C, in the valleys of Syunik -11 ... - 14⁰C. Mean daily air temperatures during this period were below normal by 7-12 degrees.

The highest temperature observed in the third decade of the month. Observed maximum air temperatures in mountainous regions +4 ... +11⁰ C, in the foothills +10 ... +14⁰C, Ararat valley +14 ... +17⁰C (Syunik valleys and the Northeast regions recorded +20 ... +22⁰C). Average daily mean temperatures exceeded the norm by 5-7 degrees.

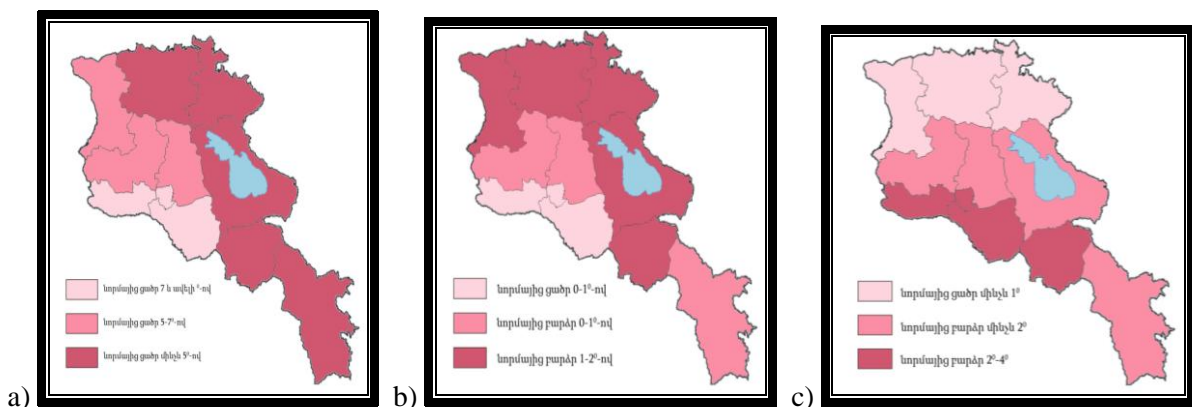


Figure 1. Temperature anomaly: a) December, b) February, c) January

Precipitation

December: Most parts of Armenia’s monthly rainfall did not exceed the normal. Precipitation totals were only 36-91% of its normal. Only 13th stations exceeded the normal; 105-210%

January: The amount of precipitation during the month in most mountainous regions, Ararat Valley, and its foothills exceeded the monthly average by 102-205% of monthly normal; Tavush and Lori was 47-90%, and Sjunq only reached 21-80% of the monthly average precipitation.

February: Monthly rainfall throughout the country had not reached the normal; 3-78 % of the normal. There was a significant shortfall in precipitation for most regions of Armenia.

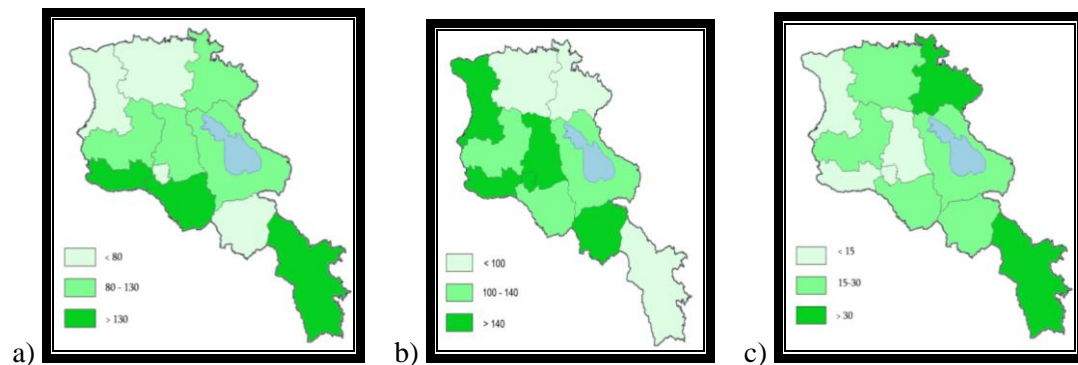


Figure 3. Precipitation anomaly: a) December, b) February, c) January

High Impact Events:

In the beginning of December, strong winds were observed with gusts up to 25 m/s which caused damage to power lines. December 8-9, 12, and January 18, 19 heavy snows closed roads to traffic. December 20- January 14, lower than seasonal temperatures were observed in the Ararat region causing damage to the agriculture in that region. Pomegranate, grape, and fig trees were frozen and will not be able to produce this coming summer. In February, Ararat Valley, Sjuniq, and, Tavush received below normal amounts of precipitations causing drought in these regions.

Cold Depression: 10 to 13 of December 2013, Cyprus was affected by a cold depression. Strong, nearly gale force, northeasterly winds were associated with dropping temperatures. Snow fall was recorded at 250m and above. The snowfall and low temperatures resulted in a number of total frost days for many regions in Armenia, but mostly over the mountainous regions.

Date	Region	Event	Duration	Rate	Damage
8 December	Razdan fountain Bagratashen Semenivka	Heavy Snow	12 hours	28 mm 20 mm 36 mm 21 mm	Fallen electrical power lines
9 December	Qajaran	Heavy Snow	12 hours	24 mm	Fallen electrical power lines
20 December-14 January	Ararat Valley	Sustained lower than normal temperatures	24 day	10-12 below normal	Agricultural ; frost bite to figs, grapes, and pomegrante trees
12 December	Ararat Ghawar	Heavy Snow	12 hours	20 mm 32 mm	Regional Road closures
18 January	Fantan Aragats / d	Heavy Snow	12 hours	20 mm 25 mm	Regional Road closures
19 January	unnamed Jermuk	Heavy Snow	12 hours	26 mm 22mm	Regional Road closures
February	Ararat Valley, Sjuniq, Tavush	Drought	entire month		Argicultural damage – effecting next seasons crops

Damages were listed in:

- The agriculture sector of the economy
- Forestry (since a lot of old but also young trees of the north face of Troodos Range were up rooted or fallen due to the wind),
- Transportation (since a lot of roads were closed for a number of days due to the frozen snow over roads surface creating dangerous traveling conditions).
- Loss of wages and school hours due to living in the harsh mountainous regions.
- A significant increased amount of fuel and electricity for heating premises
- Luckily, no casualties were reported

Verification of the MedCOF-1 climate outlook for the 2013-14 winter season:

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)	
	Observed	MedCOF-1 climate outlook for temperature	Observed	MedCOF-1 climate outlook for precipitation
Armenia	normal (Ararat valley below normal)	Weak indication	Below Normal	Weak indication

Users' perceptions of the MedCOF-1 outlook

- Which user groups have received your forecasts? (governmental authorities, public services, private companies, general public)
 - **Governmental authorities, private companies, general public**
- From which sectors are the users (e.g. energy, water, tourism, insurances, agriculture, health, ...)
 - **Energy, Agriculture, Water Management**
- Have you received any feedback from the users (were they satisfied with the forecasts, if not, why? Did they miss any important information?)
 - Negative feedback was obtained from the users of the forecasts. A warm winter season was forecasted. December through the first part of January observed significant cold events.