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WEATHER INSTABILITY IN OLTENIA BETWEEN MAY 25 AND JUNE 6, 2009

INSTABILITATEA VREMII ÎN OLTENIA ÎN INTERVALUL 25 MAI – 6 IUNIE, 2009

Ion MARINICĂ[1]

Abstract: The present paper analyses the types of synoptic situations that generated obvious weather instability within Oltenia between May 25 and June 6. Weather instability is usually associated with pronounced coolings that brought to the occurring of monthly minimum values or event o absolute minimum values for May and June during the above-mentioned interval. In certain years, in the same period, there occurred rain showers that generated great precipitation amounts and floods in certain parts of Oltenia, while other times, hail registered exceptional dimensions and, consequently, important material damages (June 2, 1995, Marinică, 1995, 2005). We consider this paper is extremely useful for the researchers involved in weather forecast and climatology.

Key-words: climatic risks, weather instability, floods, monthly minimum values, pluviometric maximum values in 24 hours, hail, storms
Cuvinte cheie: riscuri climatice, instabilitatea vremii, inundații, minime termice lunare, maxime pluviometrice în 24 de ore, grindină, vijelii

1. INTRODUCTION

From the pluviometric regime point of view, in Oltenia ***the main precipitation maximum*** is usually registered in May-June. ***The secondary precipitation maximum*** is registered between the end of autumn and the beginning of winter, namely in November-December. The secondary pluviometric maximum occurs only within those agricultural regions with sub-Mediterranean and oceanic influences, such as ***the south-west of Oltenia***, Western Plain, Western Hills, Transylvania Plateau, the seashore and South Dobroudja. The main pluviometric maximum is registered in all the agricultural regions of the country (Octavia, Bogdan, Elena, Niculescu, 1999).

In Oltenia, *the main precipitation minimum* occurs by the end of summer and the beginning of autumn (usually between August 15 and September 10); during this period, springs often get dry, the discharge of the rivers decreases and vegetation is affected by dryness. Contrasting with the extension and increase of the dryness and drought phenomena registered mainly in summer, the precipitation

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data analysis, especially in the last decade, emphasizes an increase of the precipitation amounts registered in autumn in Oltenia, when *the precipitation secondary maximum* usually occurs.

We shall further render some aspects regarding weather instability in Oltenia that frequently develops between May 25 and June 10; we also noticed a greater occurrence around June 2, fact proved by a higher frequency of rain showers accompanied by lightning and thunder, wind intensification, and hail (I. Marinică, 2006; Octavia, Bogdan, I., Marinică, 2007). A series of papers dealt with heavy rains, which sometimes generated floods, registered during this interval in different years. In this period, there appear significant cooling intervals and, in the last years, there registered monthly minimum values either for May or June or even for both months (table no. 1). It often registered maximum monthly precipitation values for 24 hours. Rains are often accompanied by hail of exceptional dimensions and wind intensifications with storm character. The appearance of these sudden changes in weather evolution in Oltenia, as well as in our country, is closely related to the transformations that develop in the atmospheric circulation in Europe and generally in northern hemisphere (Topor and Stoica, 1965).

2. DATA AND METHODS

We analysed the meteorological data between 1961 and 2009 and drew up a synthetic picture that renders the maximum precipitation values in 24 hours registered during the rains from this interval, as well as the monthly minimum temperatures.

In the achieved analysis, we used synoptic charts from Wetterzentrale, satellite maps, as well as the maps from Oltenia RMC.

By analysing the statistics of the monthly maximum amounts of precipitation in Oltenia between 1961 and 2008 in this particular interval (May 25 – June 6), we have come to the following conclusions (Table no. 1):

The frequency of the rains that generate great amounts of precipitation and we make reference to the maximum monthly value in 24 hours, in the last 48 years, oscillates between 35.4 percent in the south-east of Oltenia, at Caracal (Olt County) and 51.1 percent within the Mehedinţi Hills, at Bâcleş.

For *June*, the maximum precipitation amounts in 24 hours, in Oltenia oscillated between 42.1 l/sq m at Voineasa, amount registered on June 3, 1992 and 87.5 l/sq m at Apa Neagră on June 6, 1992.

For *May*, the maximum amounts in 24 hours, for the specific analysed period oscillated between 37.5 l/sq m at Slatina, on May 27, 1990 and 79.9 l/sq m at Tg. Logreşti on May 31, 1980.

Thus, in the last years, there is registered the maximum precipitation amount in 24 hours for both May and June during this instability interval. In this case, we calculated the sum of the maximum monthly values, which oscillated between 23.2 l/sq m registered at Slatina in 1982 and 91.2 l/sq m at Rm. Vâlcea in 1997 (table 1).

For the interval June 1-3, the frequency of maximum monthly precipitation amounts registered in 24 hours was between 16.7 percent (as compared to the total number of cases) at Apa Neagră and 37.5 percent at Rm. Vâlcea.

Table no. 1

The highest monthly maximum precipitation amounts registered in 24 hours in Oltenia between May 25 and June 6 in the last 48 years (1961-2008)

Meteorological station	No. of observed years	No. of years	% years	Pp (l/sq m) in 24 hours/date	Pp sum (l/sq m) in 24 ore Mai +June/year
Craiova	48	21	43.8	60.0/27.05.1990	66.9/1966
Băileşti	48	23	47.9	45.5/27.05.1990	65.4/1980
Bechet	48	20	41.7	48.6/27.05.1982	54.0/1966
Calafat	48	24	50.0	42.6/2.06.2006	44.2/2003
Tg. Jiu	48	22	45.8	65.2/2.06.1995	68.8/1965
Apa Neagră	48	24	50.0	**87.5/6.06.1992**	78.4/2007
Polovragi	48 (43t)	22	45.8	42.0/28.V.1971	49.0/2003
Tg. Logreşti	48 (47t)	22	45.8	79.9/31.V.1980	80.1/1966
Dr. Tr. Severin	48	22	45.8	64.0/30.V.1979	59.7/1998
Bâcleş	47	24	51.1	54.2/2.VI.1995	47.1/1963
Halânga	9(8 June)	5	**55.6**	78.1/6.VI.2008	52.3/2001
Slatina	31	14	45.2	37.5/27.V.1990	*23.2/1982*
Caracal	48	17	*35.4*	47.8/1.VI.1998	44.2/1966
Rm. Vâlcea	48	20	41.7	53.1/4.VI.1997	**91.2/1997**
Drăgăşani	48	18	37.5	77.8/26.V.1975	57.8/1963
Voineasa	48	18	37.5	42.1/3.VI.1992	-
Ob. Lotrului	32	16	50.0	42.6/2.VI.2006	-

For the interval June 1-6, the frequency of the maximum monthly precipitation amounts in 24 hours was between 37.5 percent (as compared to the total number of cases) at Caracal and 64.0 percent at Dr. Tr. Severin (table no. 2).

If we take into account those cases of weather instability that did not lead to the occurrence of maximum monthly precipitation amounts in 24 hours, the frequencies considerably increase, exceeding 70 percent at many meteorological stations.

Weather cooling that usually occurs during this instability interval is quite significant and there are frequently registered temperature minimum monthly values. This process often continues after the occurrence of the phenomena associated to atmospheric instability and this is way we took into account a greater time interval, May 25 – June 10 (table no. 3).

For May, the monthly minimum temperature oscillated between -0.5°C at Polovragi on May 28, 1991 and +8.0°C at Calafat on May 26, 1997. The frequencies registered in the occurrence of minimum thermal values in May oscillated between 4.2 percent at Voineasa and 18.6 percent at Polovragi.

For June, the minimum monthly values were between 1.2°C at Polovragi on June 6, 1997 and 6.2°C at Calafat on June 9, 1962. The thermal minimum for the sub-mountainous area was 0.5°C at Voineasa on June 1, 1990. Within the mountainous area, the thermal minimum was -2.5°C at Ob. Lotrului on June 1, 2006.

Table no. 2

Frequency of weather instability in the intervals June 1-3 and 1-6, as compared to the total number of cases between 1961 and 2008

Meteorological station	Total cases	Frequency in number of instability cases, June 1-3	Instability frequency in percent, June 1-3	Frequency in number of instability cases, June 1-6	Instability frequency in percent, June 1-6
Craiova	26	5	19.2	12	46.2
Băileşti	29	10	34.5	14	48.3
Bechet	24	7	29.2	11	45.8
Calafat	27	6	22.2	12	44.4
Tg. Jiu	24	8	33.3	11	45.8
Apa Neagră	30	5	*16.7*	16	53.3
Polovragi	26	5	19.2	10	38.5
Tg. Logreşti	25	5	20.0	11	44.0
Dr. Tr. Severin	25	7	28.0	16	**64.0**
Bâcleş	27	8	29.6	14	53.8
Halânga[2]	6	2	33.3	5	83.3
Slatina	16	4	25.0	6	*37.5*
Caracal	21	6	28.5	8	38.1
Rm.Vâlcea	24	9	**37.5**	13	54.2
Drăgăşani	21	6	28.5	8	38.1
Voineasa	18	6	33.3	10	55.6
Ob. Lotrului	17	3	17.6	6	35.3

The absolute minimum thermal value for June in the entire country is -12.0°C at Omu Peak on June 6, 1939.

The frequencies of the minimum thermal values in June registered during this interval oscillated between 40.4 percent at Tg. Logreşti and 56.3percent at Apa Neagră.

If for June, we can say that "it is normal to have minimum thermal values in the first decade of the month", this argument is no longer valid for explaining the minimum thermal values of May, which are sometimes registered during the last pentad of the month. We also notice that this argument is not always valid for June either, as in the last years the minimum thermal values registered by the middle of the month; for example, the minimum value for June 2009, 4.3°C, at Tg. Logreşti,

[2] Halânga Meteorological Station does not have a long data chain and the normal values have not been calculated yet and this is the reason for which we do not consider it in our analysis; but, for a better vision we calculated the respective frequencies for this station, as well.

registered on 14 (all the minimum values for June 2009 registered at the same date in the entire region).

Consequently, the cooling and weather instability interval that occurs quite regularly in a great number of years display certain features.

We shall further analyse the types of meteorological situations that lead to the occurrence of this weather instability and cooling in Oltenia.

Table no. 3

The lowest minimum temperature values and their frequency in Oltenia between May 25 and June 10 (1961-2008)

Meteoro logical station	Number of observed years	Freq. of the minimum temperature in May, number of cases	Frequency of the minimum temperature in May (%)	Minimum temperature (°C) in May/date	Freq. of the minimum temperature in June, number of cases	Frequency of the minimum temperature in June (%)	Minimum temperature (°C) in June/date
Craiova	48	4	8.3	2.4°C/25.05.1992	26	54.2	4.4°C/8.06.1962
Băileşti	48	4	8.3	3.4°C/25.05.2004	24	50.0	4.5°C/9.06.1962
Bechet	48	4	8.3	4.7°C/25.05.2004	26	54.2	5.8°C/9.06.1962
Calafat	48	4	8.3	8.0°C/26.05.1997	26	54.2	6.2°C/9.06.1962
Tg. Jiu	48	6	12.5	2.0°C/25.05.2004	25	52.1	2.2°C/1.06.1990
Apa Neagră	48	3	6.3	1.8°C/31.05.1997	27	**56.3**	1.9°C/8.06.1962
Polovragi	43	**8**	**18.6**	**-0.5°C/28.05.1991**	22	51.2	**1.2°C/1.06.1997**
Tg. Logreşti	47	6	12.8	0.3°C/25.05.2004	19	*40.4*	3.5°C/1.06.1990
D. T. Severin	48	3	6.3	5.6°C/26.05.2004	25	52.1	6.0°C/1.06.1990
Bâcleş	47	6	12.8	4.3°C/25.05.2004	23	48.9	4.2°C/8.06.1962
Halânga	9 (June 8)	2	22.2	2.8°C/25.05.2004	4	50.0	5.3°C/1.06.2006
Slatina	31	5	16.1	3.0°C/25.05.1992	15	48.4	5.5°C/3.06.1990
Caracal	48	4	8.3	3.6°C/25.05.2004	26	54.2	5.0°C/9.06.1962
Rm. Vâlcea	48	3	6.3	2.6°C/25.05.2004	23	48.9	3.3°C/7.06.1962
Drăgăşani	48	*2*	*4.2*	4.3°C/25.05.2004	26	54.2	6.3°C/8.06.1962
Voineasa	48	6	12.5	**-1.2°C/25.05.1992**	23	48.9	**0.5°C/1.06.1990**
Ob. Lotrului	32	3	9.4	**-2.4°C/24.05.`81.`89**	17	53.1	**-2.5°C/1.06.2006**

3. TYPES OF SYNOPTIC SITUATIONS THAT DETERMINES WEATHER INSTABILITY DURING THIS INTERVAL

The analysis of a vast archives material (48 years, 1961-2008) helped us identify the following classes of synoptic situations:

1. The Mediterranean cyclones that evolve above the Balkan Peninsula and sometimes even above Oltenia (the classical trajectory Vc, Van Beber, Topor and Şorodoc quoted by Doneaud, Beşleagă, 1966).

2. The Mediterranean cyclones formed within the trough of the Iceland Depression that evolve above the Balkan Peninsula and sometimes even above Oltenia (the classical trajectory Vc, Van Beber, Topor and Şorodoc quoted by Doneaud, Beşleagă, 1966).

3. The retrograde Mediterranean cyclones that evolve along the classical trajectory T1 (Doneaud, Beşleagă, 1966).

4. The fronts of the Iceland Cyclones that evolve on northern trajectories of the type II or III (Van Beber, Topor and Şorodoc quoted by Doneaud, Beşleagă, 1966).

5. Air mass instability in situations characterized by north-eastern, north-western or northern circulation in the lower troposphere.

We shall further exemplify a specific synoptic situation for each type.

The surface synoptic situation: At the surface level, there can be noticed a vast trough of a cyclonic field in the south and south-east of the continent, centered towards the south-east, afferent to the quasi-permanent cyclonic centre developed in the south-west of Asia during the warm season. The Azores Anticyclone extends above the north of the continent, from Scandinavia to the Great Russian Plain. According to the distribution of this pressure field, in the lower troposphere of Oltenia, the air circulation is predominantly eastern.

The altitude synoptic situation (at 500 mb level): It is noticed a high geopotential field above the Atlantic Ocean with a ridge extended above the north of the continent to the area of the Great Russian Plain. Above France, we notice a low geopotential nucleus united above the Black Sea through a vast geopotential trough with the one present in the north-east of the continent. At this level, air circulation is south-western in Oltenia. The altitude cyclonic field then evolved above Romania, and the cold front associated to this cyclonic nucleus determined heavy rain showers in the entire Oltenia.

In the synoptic situation rendered in Fig. 1, we mention frequent rain showers accompanied by hail and storms which generated rapid floods in Oltenia.

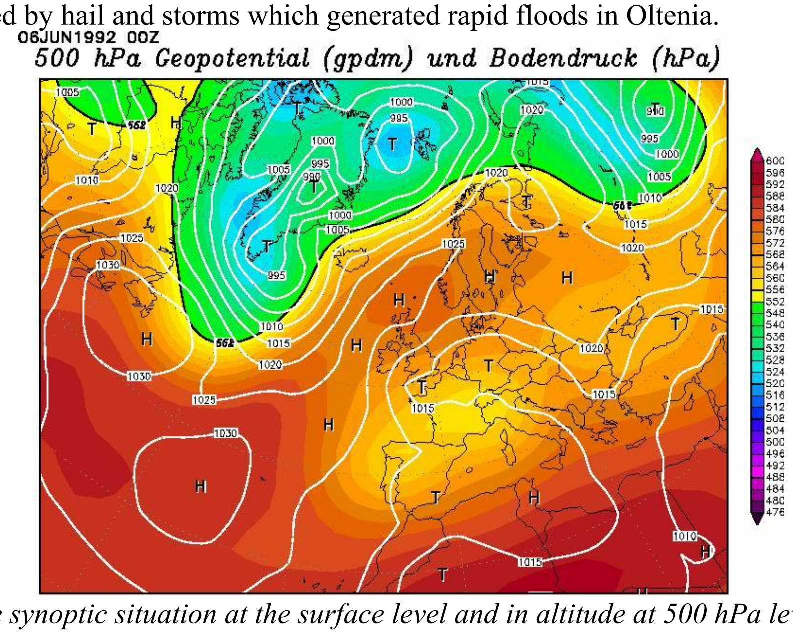

Fig. 1 *The synoptic situation at the surface level and in altitude at 500 hPa level (colour shades), on June 6, 1992 at 12 UTC, during the initial moment of the active phase* (after Karten Archiv Karlsruhe).

The maximum precipitation amount in 24 hours in Oltenia reached 87.5 l/sq m at Apa Neagră (Gorj County) (table no. 1), which represents the record value for this parameter for this meteorological station in the last six days of June, but also for the entire Oltenia in the last 48 years.

For type 2. The synoptic situation registered on June 2, 1995 (Fig. 2). *The synoptic situation at the soil level*

On June 2, 1995, within the trough of the Iceland Depression, which extended to the northern Africa, there developed a Mediterranean Cyclone that then extended over the Balkan Peninsula and over the southern part of our country (fig. 2).

The cold polar continental + polar maritime air mass penetrated behind the depression, over Western Europe, and led to the appearance of a strong and active cold front. In front of this front, there was a warm moist tropical air mass coming from the south.

When the atmospheric front penetrated, the thermal contrast between the air masses located in front and behind the front reached 10–12°C and the maximum temperature drop registered 11°C in an hour. The atmospheric front crossed Oltenia from west to east. Its penetration over the territory of Oltenia was achieved when the thermal convection reached its maximum, at 11–12 UTC.

Thermal convection strongly developed starting from early morning, as the soil was humid (it had rained in the previous afternoon). The effects of thermal convection amplified the development of the frontal cloud system and its effects. The thermal horizontal gradient reached about 12°C on a distance of 50 km and the baric gradient was intense, 5mb/150km.

The front had two strong main convective nuclei that overlapped, one in the south of Oltenia and the other in the north of the region. The vertical development of the cloud system reached 10,000 meters (Marinică, 2005).

The evolution of the situation was extremely fast – the phenomena occurred in less than 12 hours. The final phase led, as usually, to the ceasing of the phenomena and clearing up.

Vast surfaces of Oltenia faced massive destructions; crops and not only were badly damaged by hail as in some settlements (Băileşti) hail reached the size of the goose egg, destroying an impressive number of roofs (hail and the damages were filmed by the local television studio *Terra Sat*).

Damages were estimated at several hundred thousand dollars and calamity papers were made for large agricultural surfaces in the entire Oltenia. During the evolution of this situation, it was registered an amount of 68.8 l/sq m at Tg Jiu, *value that represents the maximum of this parameter for the meteorological station in question for the first pentad of June in the last 48 years*.

The maximum precipitation amount registered during the evolution of the front reached 117.0 l/sq m, at Gogoşu, in Mehedinţi County.

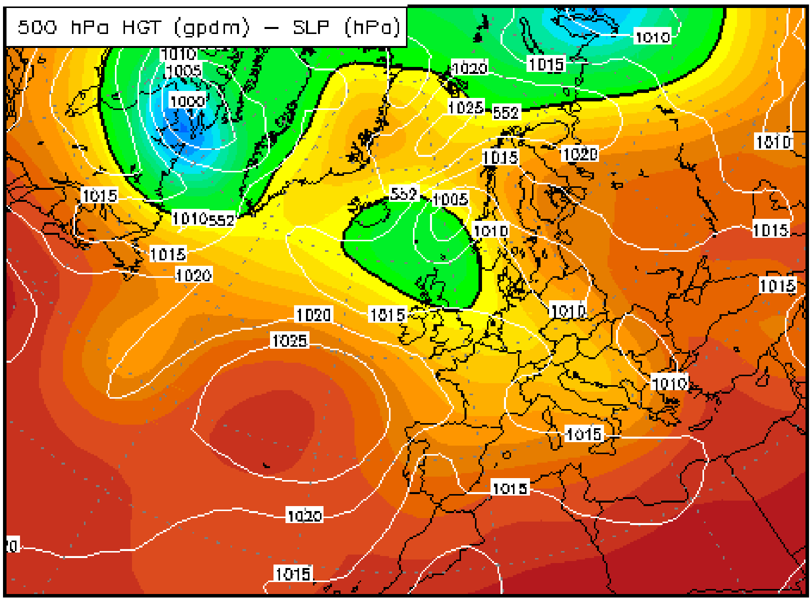

Fig. 2 *The synoptic situation at the surface level and in altitude at 500 hPa level (colour shades), on June 2, 1995 at 12 UTC, during the initial moment of the active phase* (after Karten Archiv Karlsruhe).

As the geopotential nucleus diminished at altitude it shifts east or southeast, demoting ceases, occlusion appears, the frontal systems move away from our country, and rainfalls cease as well.

During the evolution of this situation, frequent rain showers accompanied by lightening and thunders, hail and wind intensification with storm aspect developed in Oltenia. ***The maximum amount in 24 hours reached 64.0 l/sq m at Dr. Tr. Severin, value that represents the maximum of this parameter at Dr. Tr. Severin for the last pentad of May in the last 48 years***.

For type 4: the synoptic situation from June 4, 1997 (Fig. 4).

In this situation, we notice that the vast field of the North-Canadian Anticyclone extended over Greenland and its ridge over Great Britain, Central Europe, Italy, central part of the Mediterranean Sea and even Northern Africa. A cyclone of Icelandese origin is centered on the White Sea and Kola Peninsula.

The altitude geopotential field from 500 hPa closely follows the surface field pressure. In our country, the circulation is north-western.

The cold front associated to this depression field crossed Oltenia in the afternoon of June 4, 1997. During this evolution, heavy rainfalls accompanied by wind intensifications with storm aspect, hail, lightning and thunders registered in Oltenia. At Rm. Vâlcea, precipitation amount in 24 hours reached 53.1 l/sq m, which represents the absolute maximum value of this parameter at this meteorological station for the first pentad of June in the last 48 years.

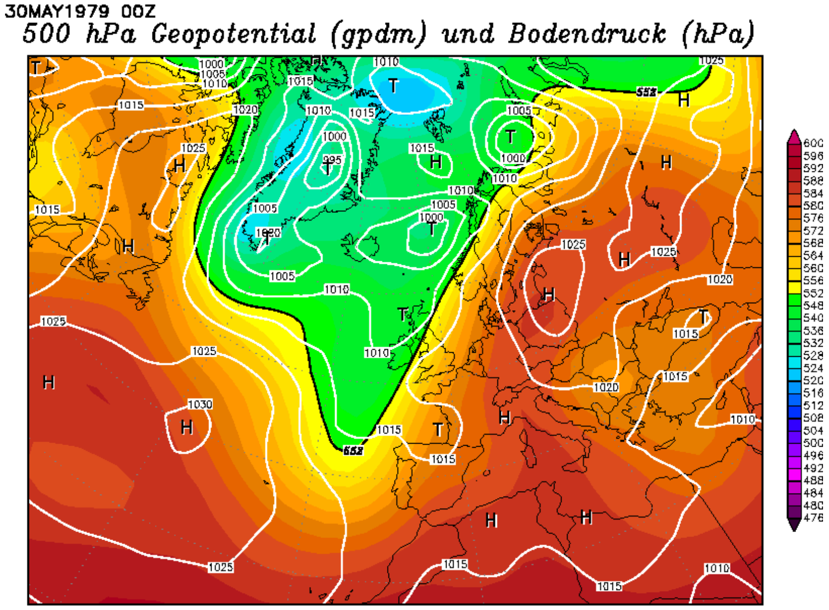

Fig. 3 *The synoptic situation at the surface and in altitude at 500 hPa level (colour shades), on May 30, 1979 at 00 UTC, during the active phase* (after Karten Archiv Karlsruhe).

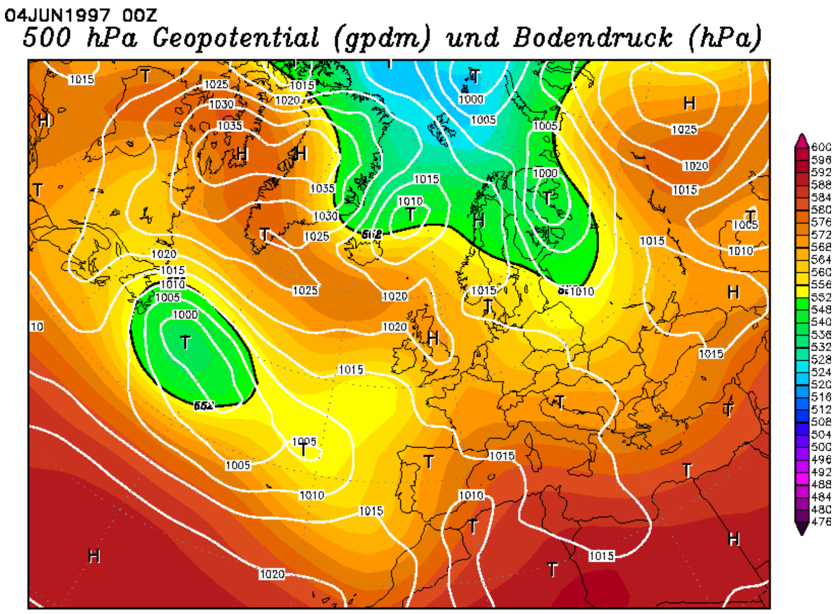

Fig. 4 *The synoptic situation at the surface and in altitude at 500 hPa level (colour shades), on June 4, 1997 at 00 UTC, during the active phase* (after Karten Archiv Karlsruhe).

For type 5:

In such situations, weather instability develops in the afternoon covering vast areas of the continent in certain days without a direct connection to an atmospheric front.

We give as an example the instability situation registered on June 30, 2009, which is not included in the studied interval, but it is extremely significant for this type (Fig. 5). Rains are frequently accompanied by lightning, display an isolated or local character, and in certain places, they can generate important precipitation amounts and floods on reduced surfaces within small hydrographical basins. They can be accompanied by storms and hail.

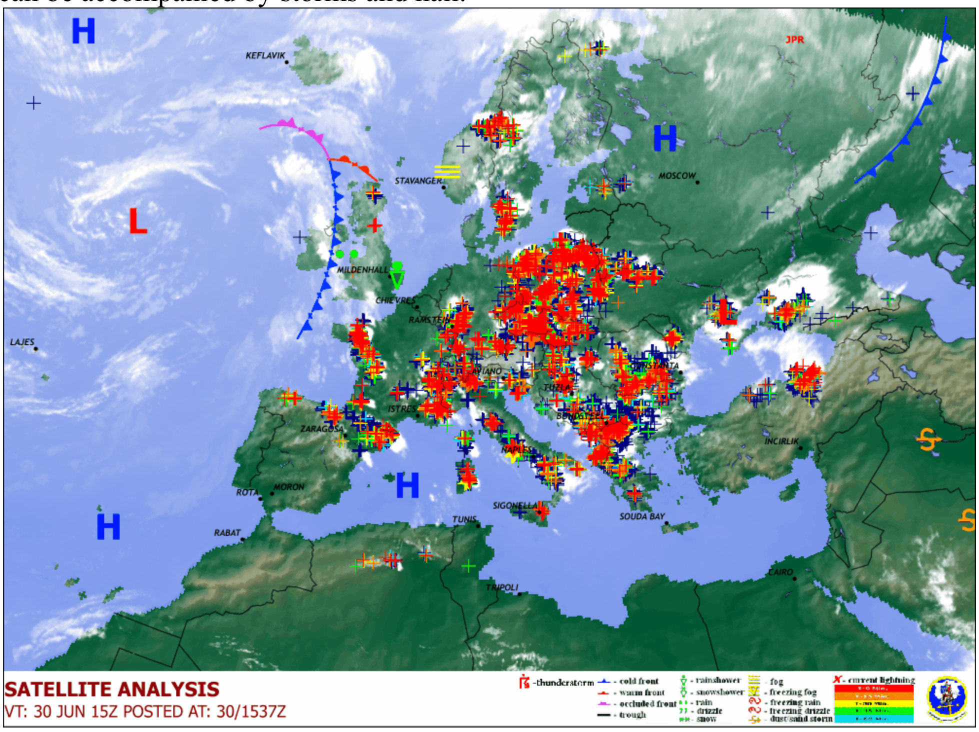

Fig. 5 *Instability of the air mass in the afternoon (situation registered on June 30, 2009, 15 UTC)* (after Karten Archiv Karlsruhe).

The synoptic situation registered on May 25, 1975.

The synoptic situation at the surface level at 00 UTC presents an anticyclonic field located north of Great Britain that is united with the Azores Anticyclone, while in the southeast of the continent there is a vast but low anticyclonic field. In the lower troposphere, air circulation is north-eastern (Fig. 6, white isolines).

At altitude, at 500 hPa level, we may notice the ridge of the high geopotential field located in the south of the continent, extended over the Atlantic Ocean to the north of the British Islands where it develops a high geopotential nucleus. At this level, above France, we notice a low geopotential nucleus (556 damgp). For

Oltenia, at this level, air circulation is south-western, but reduced, and consequently, a warm and moist air advection occurs. In such a situation, weather instability usually occurs in the afternoon when the penetration of cold air from the lower troposphere create a contrast with the warm advection from the altitude and overlap the diurnal thermal convection that reaches its maximum.

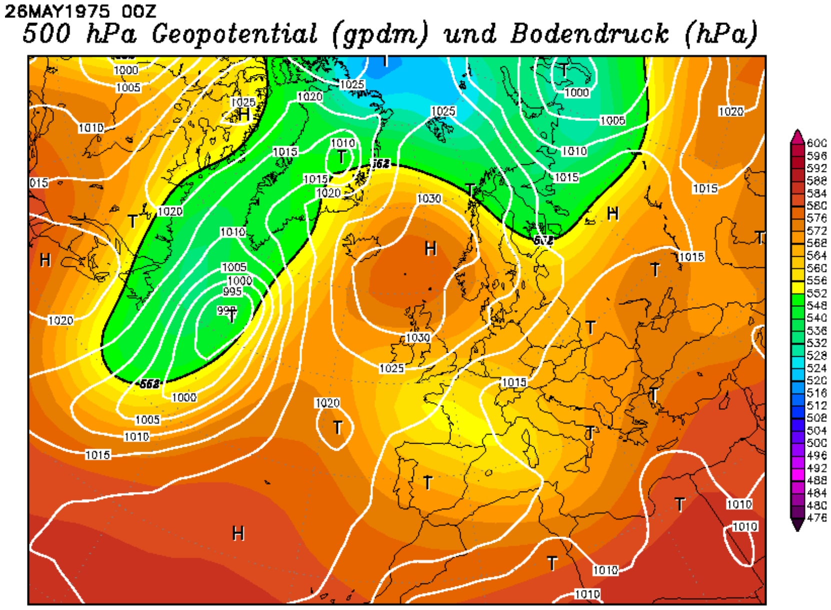

Fig. 6 *The synoptic situation at the surface level and in altitude at 500 hPa level (colour shades), on May 26, 1975 at 00 UTC, during the active phase* (after Karten Archiv Karlsruhe).

Consequently, there occur local rain showers accompanied by lightning, hail, and wind intensification. In these circumstances, ***the maximum precipitation amount in 24 hours for the last pentad of May in the last 48 years reached 77.8 l/sq m and it registered at Drăgăşani; this is also the maximum amount for the entire Oltenia***.

Sometimes, in Oltenia, due to the geographical position of the region and of the interaction between the relief and air circulation in Europe, rain showers induced by the properties of the air mass develop even in those cases when forecasts indicate nice or generally nice weather.

Such an exceptional situation is *Fratoştiţa Case* (June 5, 2003).

On June 5, 2003 at four o'clock (RSH [3]), in Fratoştiţa village that administratively belongs to Filiaşi (Dolj County), it started raining heavily. Frequent lightning and wind intensification accompanied the rain. The rain lasted

[3] RSH = Romania Summer Hour

for about 2 hours, between 4 and 6. The great water amount went down towards the lowest landforms and provoked the flooding of hundred of households from Fratoştiţa and the neighbouring commune, Ţânţăreni, from Gorj County. It is worth mentioning that there did not fall a single raindrop in the neighbouring commune Ţântăreni, the flood reached the area about 7.30, namely one hour and a half after the rain from Fratoştiţa village and it flooded the entire commune. The level of the water exceeded 1 meter in some yards; a great number of poultry and animals got drowned. Water started to retreat about 10 o'clock. It is also interesting that in that night radar echoes registered above indicated that this was the only significant rain from the south of the country (fig. 7 and 8); while in the neighbouring county, Teleorman, the echoes diminished till they disappeared, in Oltenia the height of the cloud cell increased from 6.4 km to 10.6 km in just three hours and the rain intensity from 5 l/sq m/hour to 8.5 l/sq m/hour. This emphasizes the presence of a nocturnal convection process of dynamic origin mainly induced by the uplifting of an air mass formed above the hilly area, where the altitude varies between 161 m and 276 m. The air mass moved southwards in accordance with the direction of the air current from the upper troposphere (500 hPa level, fig. 8). This is linked to the wavy movement of the air above the mountain obstacle that induced waves the lengths of which are proportional to the height of the mountain chain (during this interval the movement of the air above Oltenia was from NNW to SSE).

This aspect is also visible a little farther in the east, in Teleorman (fig. 7 and 8), but here, precipitation phenomena diminished quickly.

The technical commission of expertise appreciated that precipitation amount exceeded 100 l/sq m (Florin Ţanovici, 2003). Firemen intervention was necessary. They arrived at ten o'clock and tried to save some things. In the afternoon of June 5, 2003, there occurred isolated rain showers in Oltenia, especially in the hilly and mountain regions, but precipitation amounts were not significant.

The analysis of the synoptic situation at the surface level indicates a vast anticyclonic belt extended from the Atlantic Ocean to the Caspian Sea, above the largest part of Europe (Fig. 9), while the Iceland Cyclone was centered south west of Iceland.

At altitude, at 500 hPa level, there can be noticed a geopotential ridge over the largest part of Europe, and at this level, air circulation above Oltenia was from the north-west, namely from Central Europe, but previously it has followed a south-western direction which emphasizes the presence of a mP air mass. Above Oltenia, air circulation in the lower and upper troposphere was convergent.

Local relief conditions and its interaction with air circulation played an important role in the development of this particular situation. Even if from the synoptic point of view, weather forecast mentioned rain showers, it was impossible to specify accurately the extremely high intensity of the rain and the area affected by these phenomena. The only instrument able to forecast the phenomenon both as location and intensity was the meteorological radar.

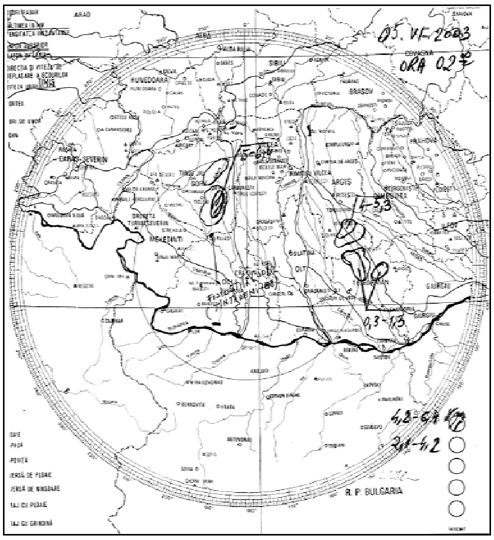

Fig. 7 Radar echoes on June 5, 2003 at 2 o'clock (RSH) (Craiova Radar)

Fig. 8 Radar echoes on June 5, 2003 at 5 o'clock (RSH) (Craiova Radar)

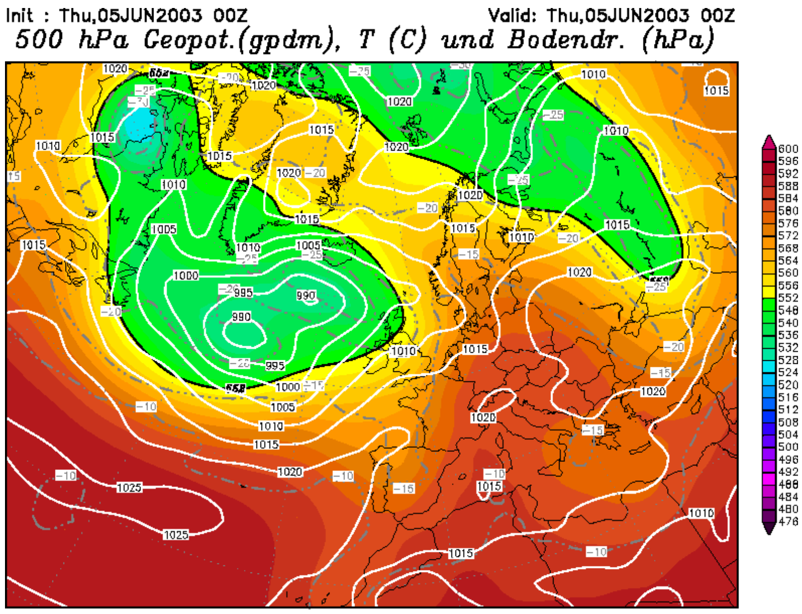

Fig. 9 *The synoptic situation at the soil level and in altitude at 500 hPa level (colour shades), on June 5, 2003 at 00 UTC, during the active phase* (after Karten Archiv Karlsruhe)

CONCLUSIONS

Between May 25 and June 6, our country is affected by certain phenomena induced by weather instability: rain showers that generate huge amounts of precipitation in 24 hours or in a short time (2-3 hours) and are generally associated with hail and wind intensification. These heavy rains generate floods, landslides that destroy roads and bridges, which mean material damages oscillating between 34.5 and 55.6 percent. If we take into account the situations when weather instability, although well marked, did not determined record amounts of precipitation in 24 hours, the frequency increases a lot, reaching almost 80 percent.

Statistical data emphasize a higher frequency of these phenomena on June 1, 2, and 3. The greatest maximum amount of precipitation registered in 24 hours during this specific interval was 87.5 l/sq m at Apa Neagră in Gorj County on June 6, 1992.

Due to the material damage occurred in time, the effects of these phenomena associated with weather instability emphasize the fact that climatic risk is extremely high.

During this interval, it should not be underestimated any meteorological situation with predictable weather instability. Weather instability for the interval May 25 – June 6 is accompanied by weather cooling, which often continues till June 10.

In the last 48 years, we registered extremely low monthly minimum values in May and especially in June.

For May, these values oscillated between -0.5°C at Polovragi on May 25, 1991 and 8.0°C at Calafat on the 26th, 1997. In the sub-mountainous area, at Voineasa, the lowest monthly minimum temperature in the last pentad of May was -1.2°C on May 25, 1992, while in the mountain area it was -2.4°C at Ob. Lotrului on May 24, 1981 and 1989.

For June, the minimum temperatures registered in the first decade of the month in the last 48 years oscillated between 1.2°C at Polovragi (June 1, 1997) and 6.3°C at Drăgăşani (June 8, 1962). In the sub-mountainous area, at Voineasa, the lowest thermal value for the first decade of the month was 0.5°C (June 1, 1990), while in the mountains, it was -2.5°C at Ob. Lotrului (June 1, 2006), namely 0.1°C lower than the value registered in the last pentad of May, which proves the exteme intensity of cold advections during this interval of the year.

In the entire country, the absolute minimum temperature for June is -12.0°C at Omu Peak registered on June 6, 1939.

Agriculture is affected by frequent ***climatic risks*** in this interval both as damage generated by rain showers, hail and storms and as ***thermal risk,*** as we all know that plants development (especially vegetables, but other plants as well) stagnates, blossoming and fructification no longer occur at certain critical thermal values and, sometimes, a prolonged interval characterized by low temperatures irremediably damages the crops.

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