

SEVERE WEATHER PHENOMENA IN HELLAS DURING WINTER 2001-2002



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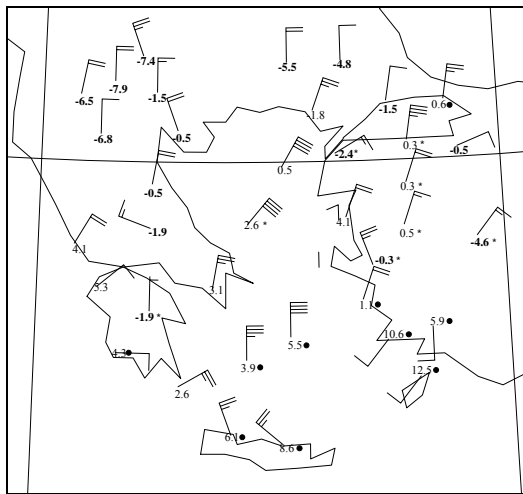
Hellenic National Meteorological Service

ABSTRACT

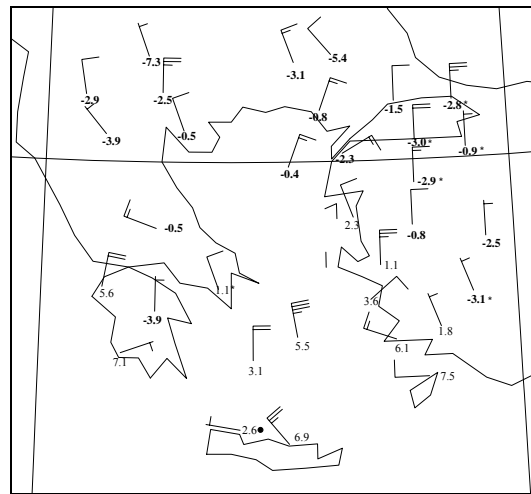
During the period 15th November 2001 to 6th January 2002 Hellas was affected by high-impact weather, characterized by very low temperatures and widespread rainfall and snowfall. In the present study, climatological data are compared with available observations for various stations in Hellas which indicate that in many cases temperatures were the lowest recorded in the past 50 years.

INTRODUCTION

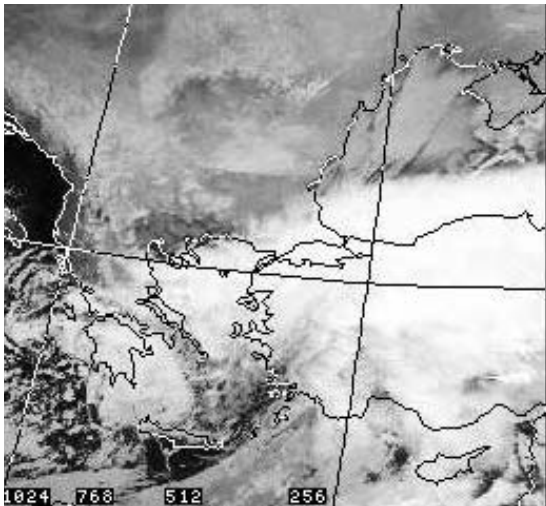
Exceptional weather conditions prevailed over Hellas during the 2001-2002 winter as strong to gale force winds transferred cold air masses from northern parts of Europe and caused very low temperatures.



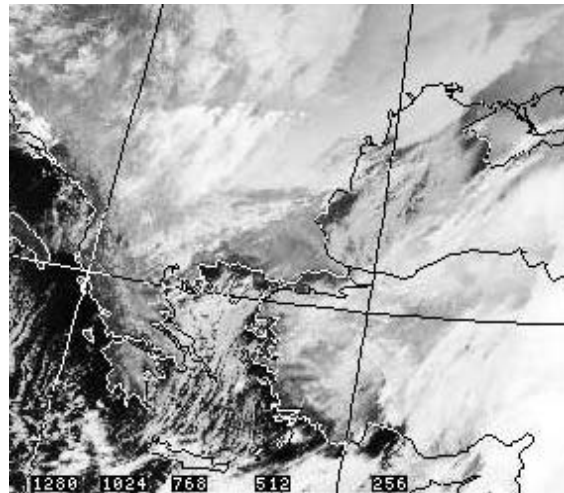
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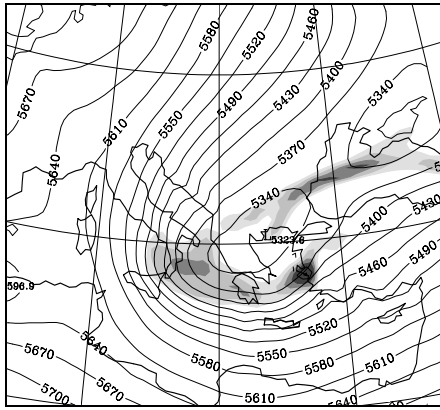


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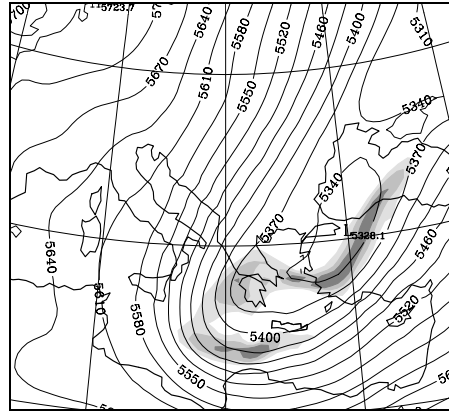


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NOAA

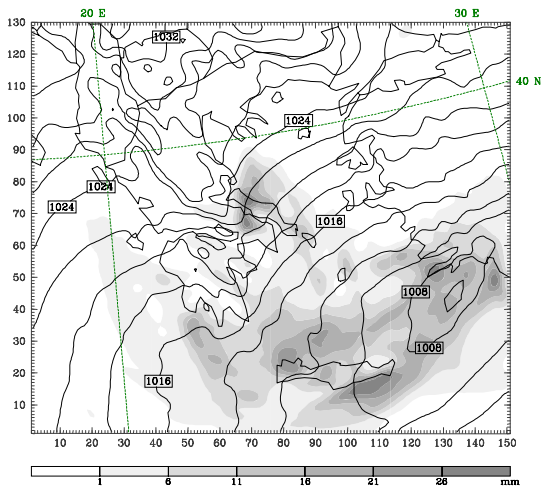


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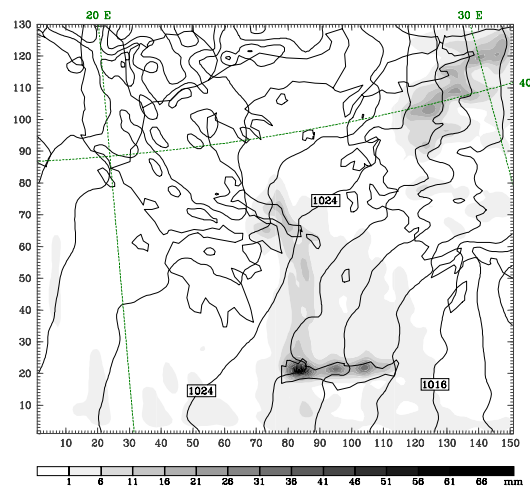


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500 hPa



1200-2400 UTC 4 JAN 2002



0000-1200 UTC 5 JAN 2002

Snowfall

1. DECEMBER 2001

December 2001 was categorized as very cold since the mean maximum temperature at all but one of the reporting stations in Hellas was below normal. For instance, the mean maximum temperature in Athens during this month was 9.5°C, which is much lower than the normal maximum temperature of 14.4°C.

December 2001 can be compared to December 1991 when the mean maximum temperature was 9.3°C, a record low during the last 50 years. In central and northern Hellas the weather was extremely cold as well. During the period 16th to 23rd December there were observed extreme weather phenomena such as intense snowfall and frost.

In the past, and more specifically on 16th and 17th December 1988, central and northern Hellas was hit by severe weather. During this short period, snow depths in Thessaloniki reached 1 metre and the local airport was closed for 5 days. Ten years later on 19th and 20th December 1998, clear skies at night and light winds following snowfall led to a severe frost and very low temperatures were observed. Similar conditions occurred during the

period 19th to 22nd December 2001. During this time, mean maximum temperatures were well below normal across the entire country. This conclusion results from a systematic analysis of recorded climatological data kept at the HNMS archives (See Figure 1). As you can see, only Corfu (Kerkyra) recorded a mean maximum temperature that was a little higher than normal (highlighted in yellow in Figure 1), while Larissa showed the largest deviation at 7.1°C below normal. On the other hand, the lowest mean maximum temperature was found in Florina, which was -3°C.

Absolute maximum temperatures (Figure 2) were also very low, especially in central and northern regions. Temperatures in Kozani did not exceed 6.2°C, which set a record. Previous record conditions occurred in January 1974 when the absolute maximum temperature was 7.6°C and December 1984, when the absolute maximum temperature was 9.8°C.

Mean minimum temperatures were also below normal levels across the whole country (see Figure 3), with negative values at every northern reporting station and several across central Hellas. The largest difference was 8.8°C below normal and it was also observed in Kerkyra.

The following table (Table 1) shows a comparison of the lowest temperatures that occurred in 1998 and 2001.

<u>Table 1</u>		
	1988	2001
KASTORIA	-18.6	-22.8
FLORINA	-17.0	-21.0
TRIKALA	-18.4	-20.4
LARISSA	-17.5	-20.2
THESSALONIKI	-9.2	-9.8

Many stations in the northern regions of Hellas such as Serres, Florina, Kastoria, Trikala Imathias, Thessaloniki and Kozani, in central regions such as Larissa, Trikala Thessalias, Volos and Lamia, and every station in Attica recorded precipitation amounts much higher than usual. This was also the case in the Aegean, Crete and Sporades and more specifically on the island of Skiathos where rainfall amount was three times more than usual (see Figure 5).

Figure 6 presents days of snowfall in December 2001 relative to the normal and shows that Kozani had - for the first time since 1955 - snow for half a month (15 days)! Also Trikala Thessalias, Florina and Kastoria had 12 days of snowfall. It is remarkable to note that only in January 1981 were there 11 days of snowfall in Trikala, while in all the other cities mentioned above snowfall duration never exceeded 4 days.

Finally, it is worth mentioning that it snowed for the first time in Argostoli, Pyrgos, Zakynthos and Kalamata.

2. JANUARY 2002

Extreme weather conditions prevailed during the first 10 days of January 2002, especially between the 4th and 7th of the month. There was intense snowfall and extremely low temperatures in the coastal and flat areas of central and southern Hellas. It snowed for the first time in Tymbaki, the coastal regions and flat areas of Peloponnesus, the Cycladic

islands and Crete. It also snowed in Iraclion, Chania, Sitia whilst snow depths in the mountainous areas of Crete reached 3 meters.

Snowfall in Attica, Viotia and Evia was intense and of relatively long duration considering the fact that in these regions it only snows once every 3 to 5 years. The last time Athens was covered with snow was in March 1992, especially on 18-19th and 22-23rd when the estimated snow depth reached 10 to 15cm and the ground was covered with snow for a further two days. During the winter of 1962-1963 it snowed repeatedly although snow depths did not exceed 15 cm in the centre of Athens. In January 2002, snow depth in New Philadelphia was 12 cm, in Spata 19 cm and in Tanagra 63 cm. All these three stations are located in the greater Athens Metropolitan Area.

In Figure 7 we can see the number of days of snowfall for January 2002. Central Hellas and Crete both had a lot of snow. In general, however, precipitation totals were less than normal except for stations located in Crete (see Figures 8, 9).

Examining the mean maximum temperatures in Figure 10 we can see that these actually deviated little from normal over the month as a whole. On the other hand, by taking a quick look at mean minimum temperatures we can see that their values are below normal levels for central and southern Hellas (see Figure 11). From Figure 12, we can also conclude that there were no extreme conditions concerning the absolute minimum temperatures. Conversely, absolute maximum temperatures that were observed between 11th and 20th January 2002 in Serres, Drama, Kastoria, Trikala Imathias and Tripoli set a new forty-year record (Figure 13).

Finally, the absolute lowest maximum temperature observed in New Philadelphia in Athens was 0.2°C, recorded on 6th January 2002. This value is the lowest observed over the past 50 years during winter according to our archives. Previous records were 1.2°C, which was observed on 25th January 1963 and 0.6°C, observed on 19th February 1983.

CONCLUSION

Severe weather phenomena prevailed in Hellas starting on 15th November 2001 and lasting until 6th January 2002.

During December 2001, extremely low temperatures were observed in central and northern parts of Hellas and in many cases, the lowest in 50 years. Also, precipitation amounts were higher than normal mostly in central and southern Hellas. The number of days of snowfall was very high until the first ten-day period of January 2002. Also, snowfall amounts were up to three times more than normal mainly in central and southern Hellas. Finally, for the remaining days of January and February 2002 fine weather prevailed and in some cases the absolute maximum temperature set new records.

FIGURES

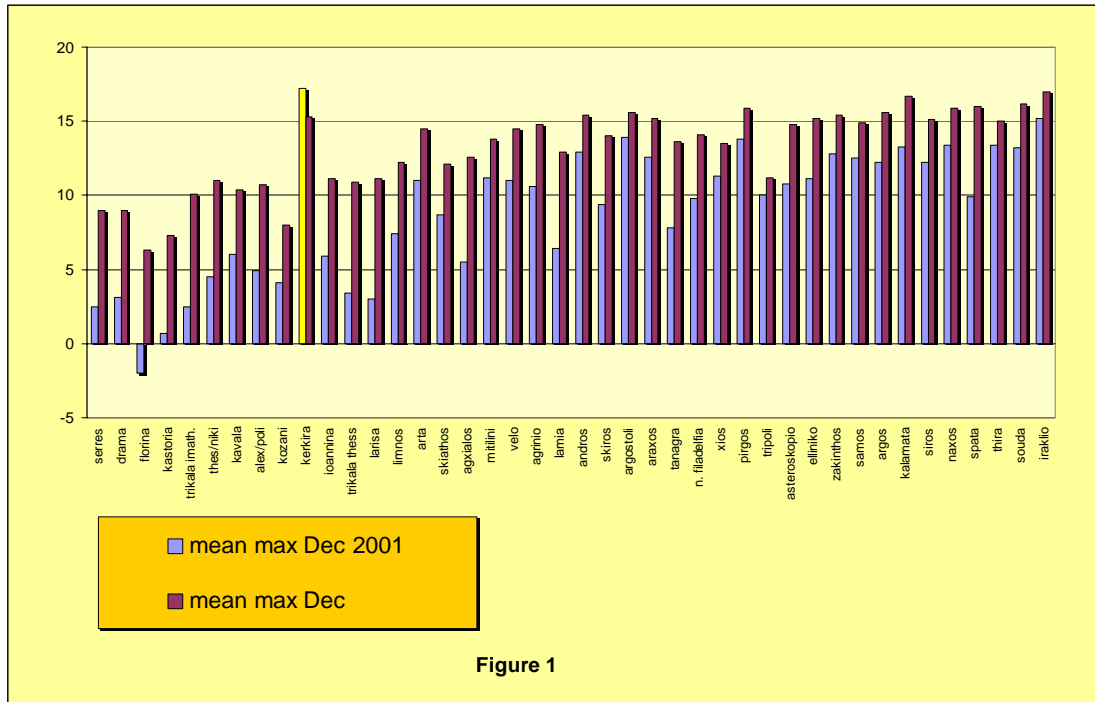


Figure 1

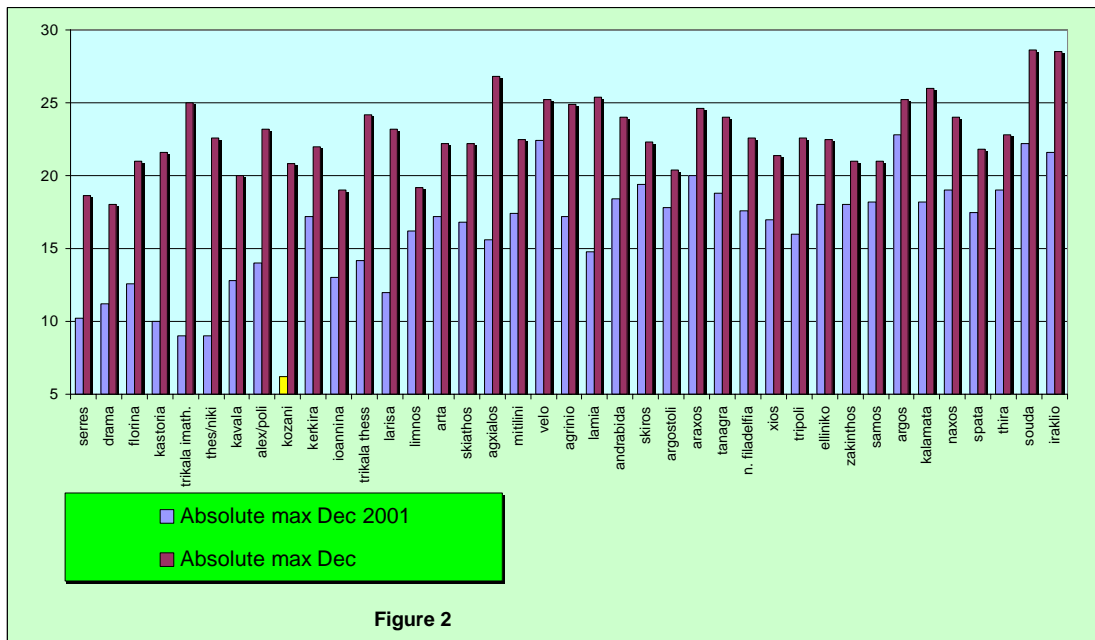


Figure 2

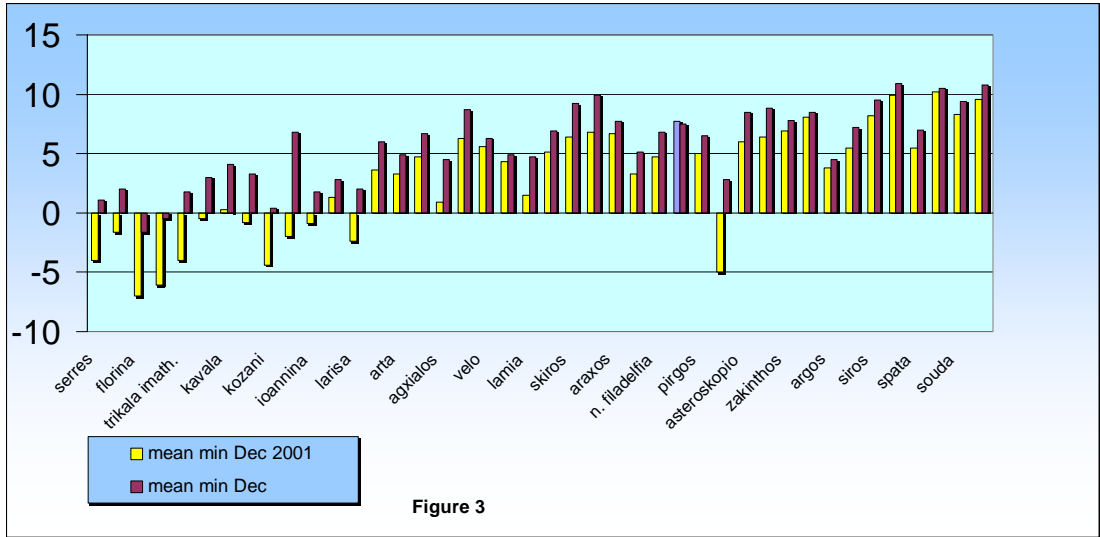


Figure 3

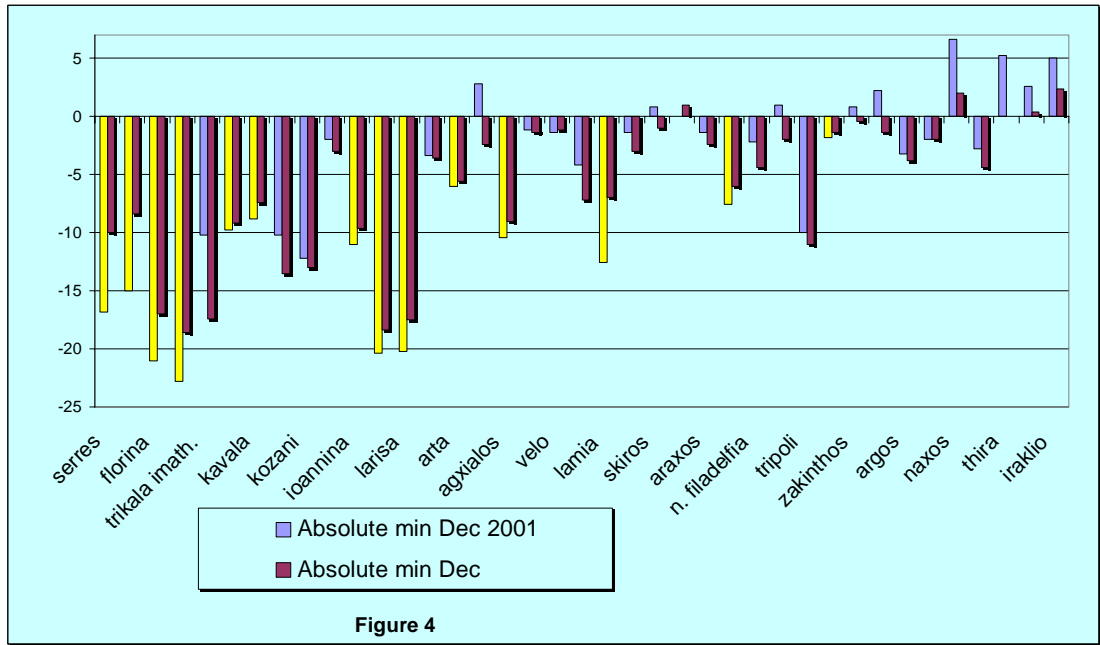


Figure 4

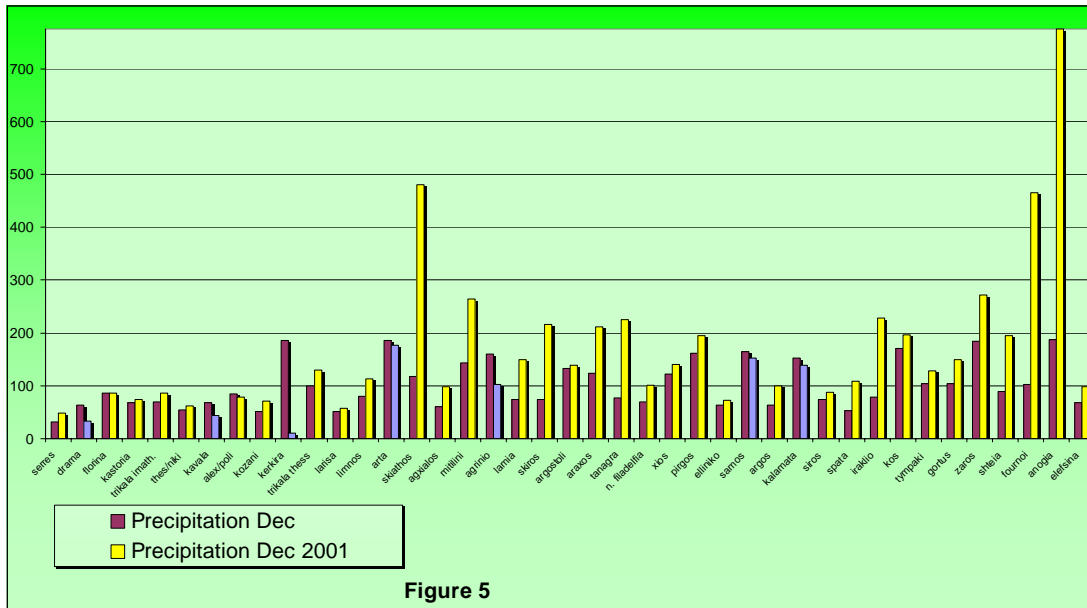


Figure 5

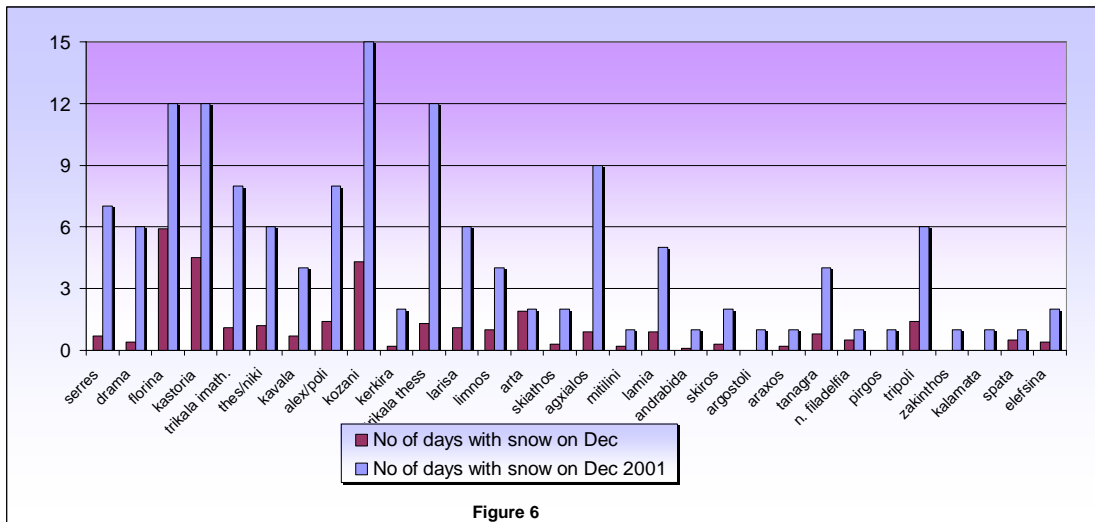
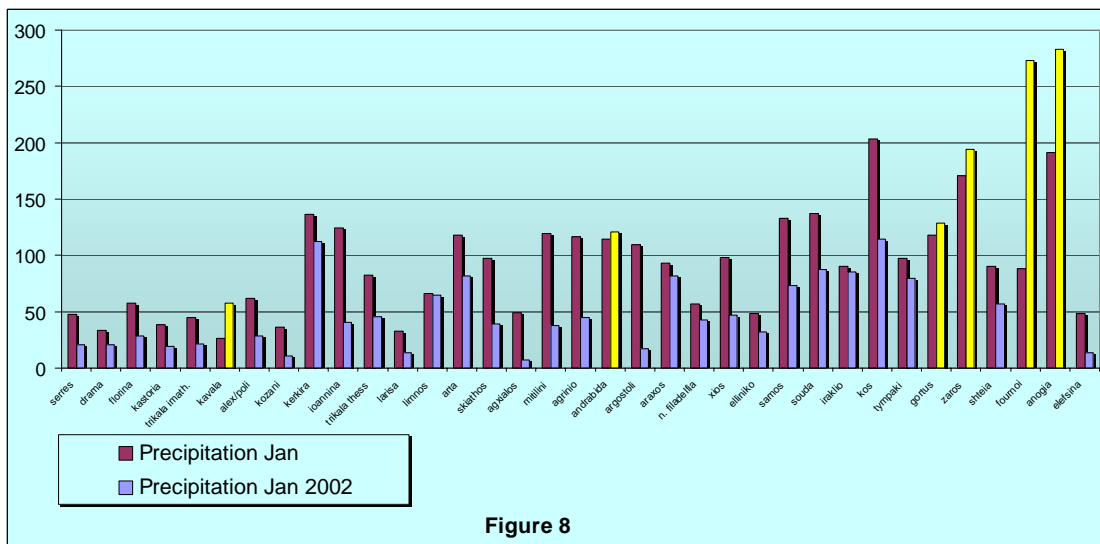
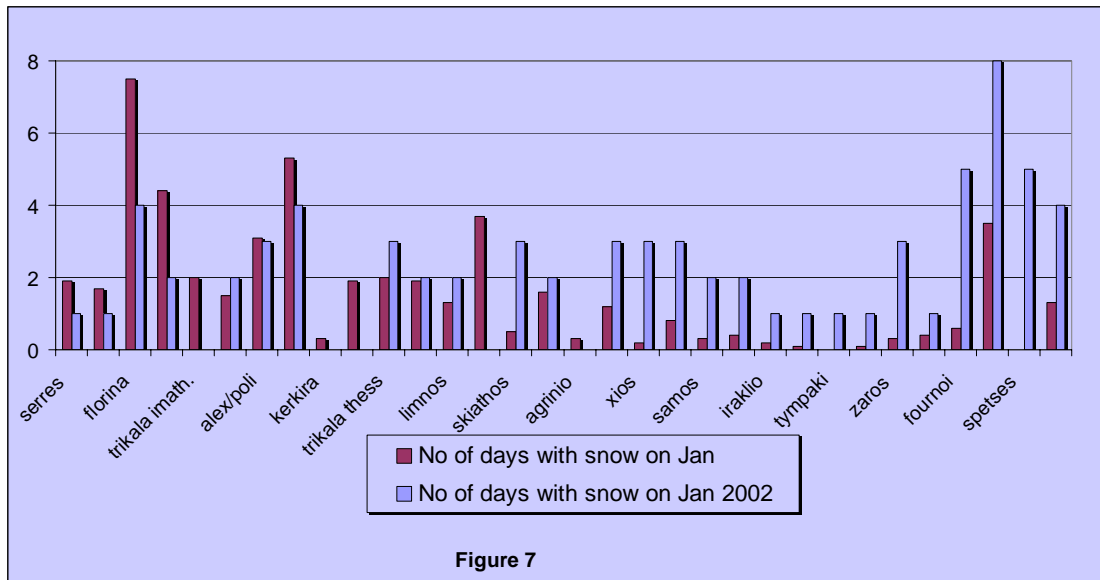
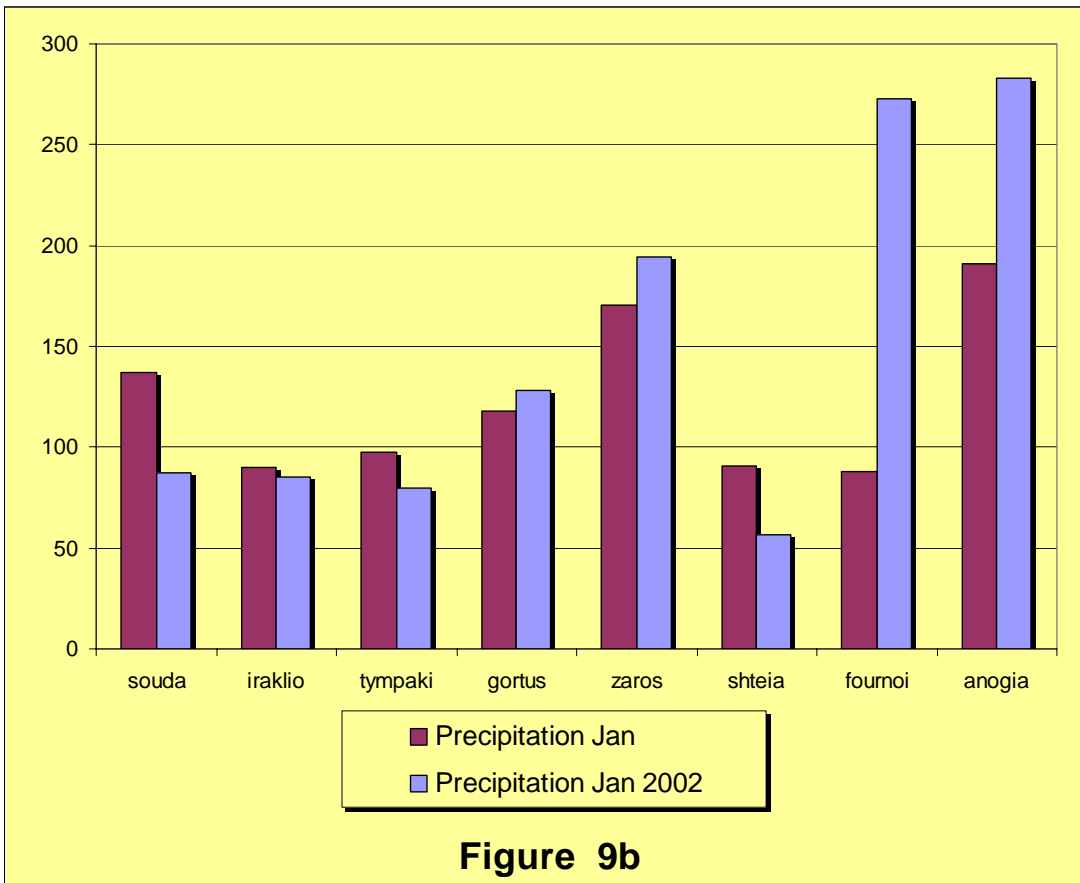
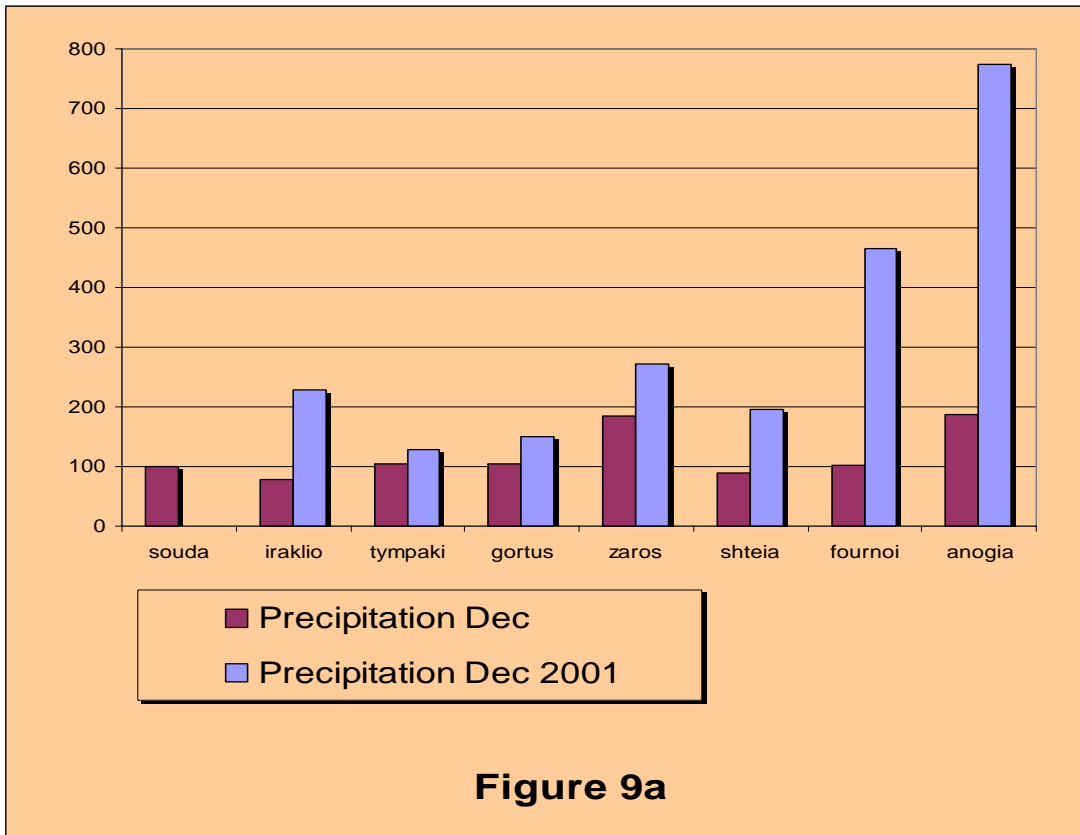
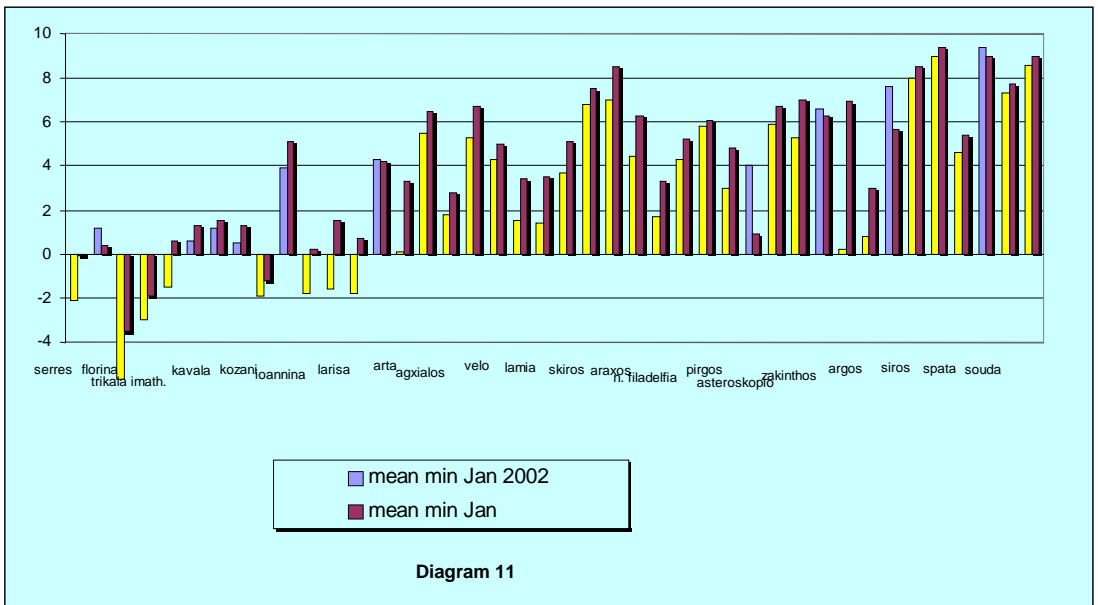
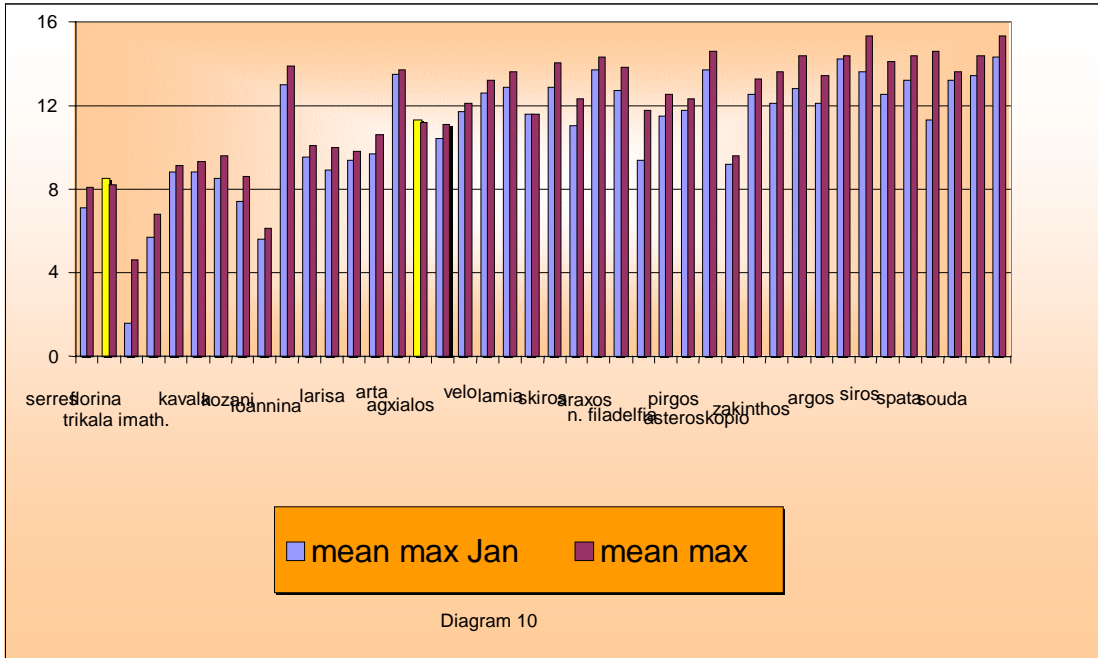


Figure 6







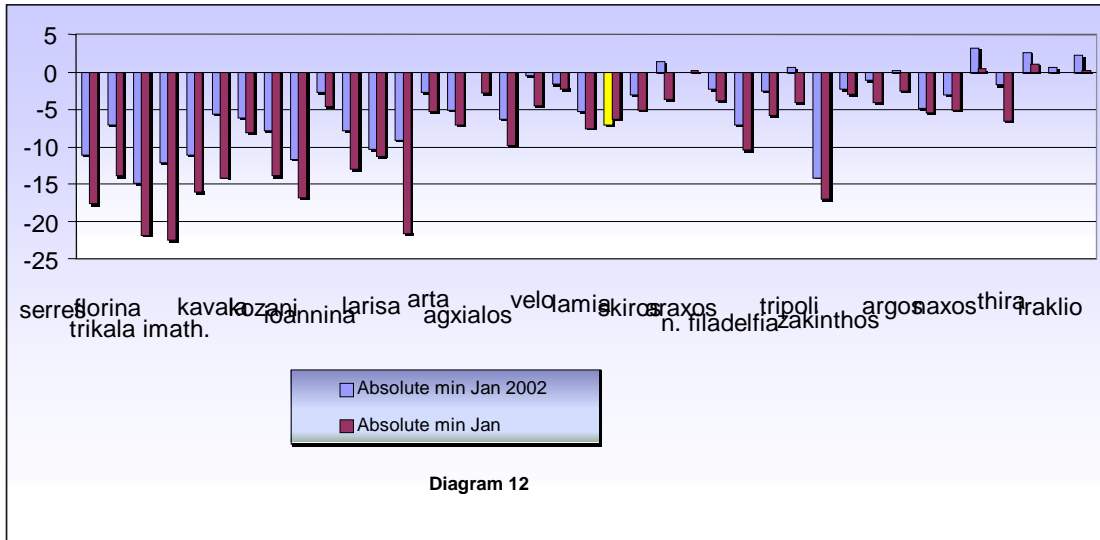


Diagram 12

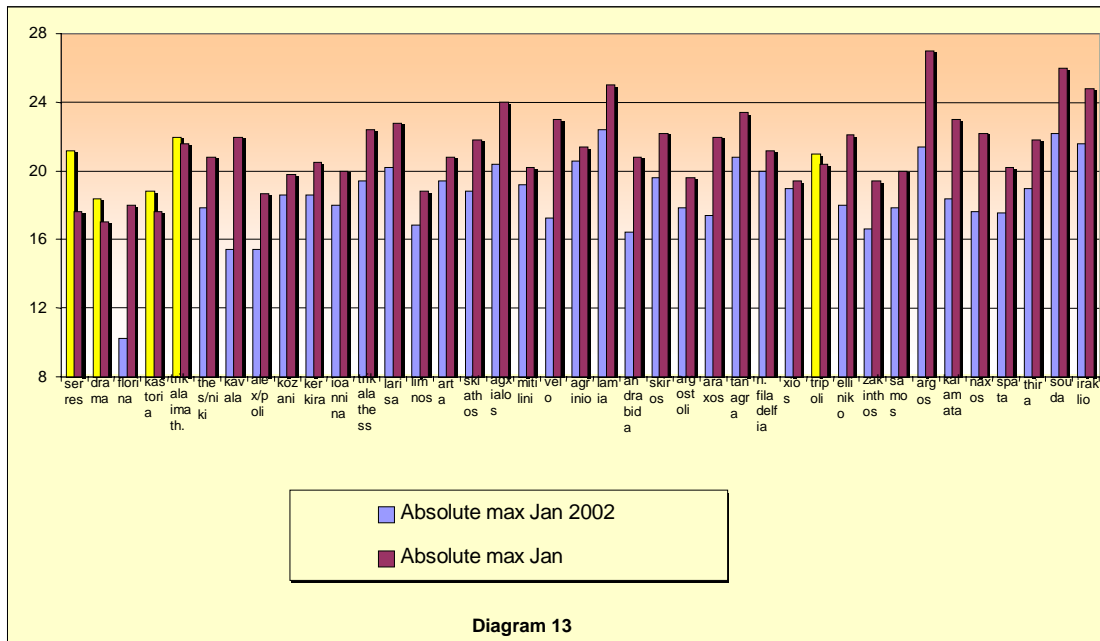


Diagram 13