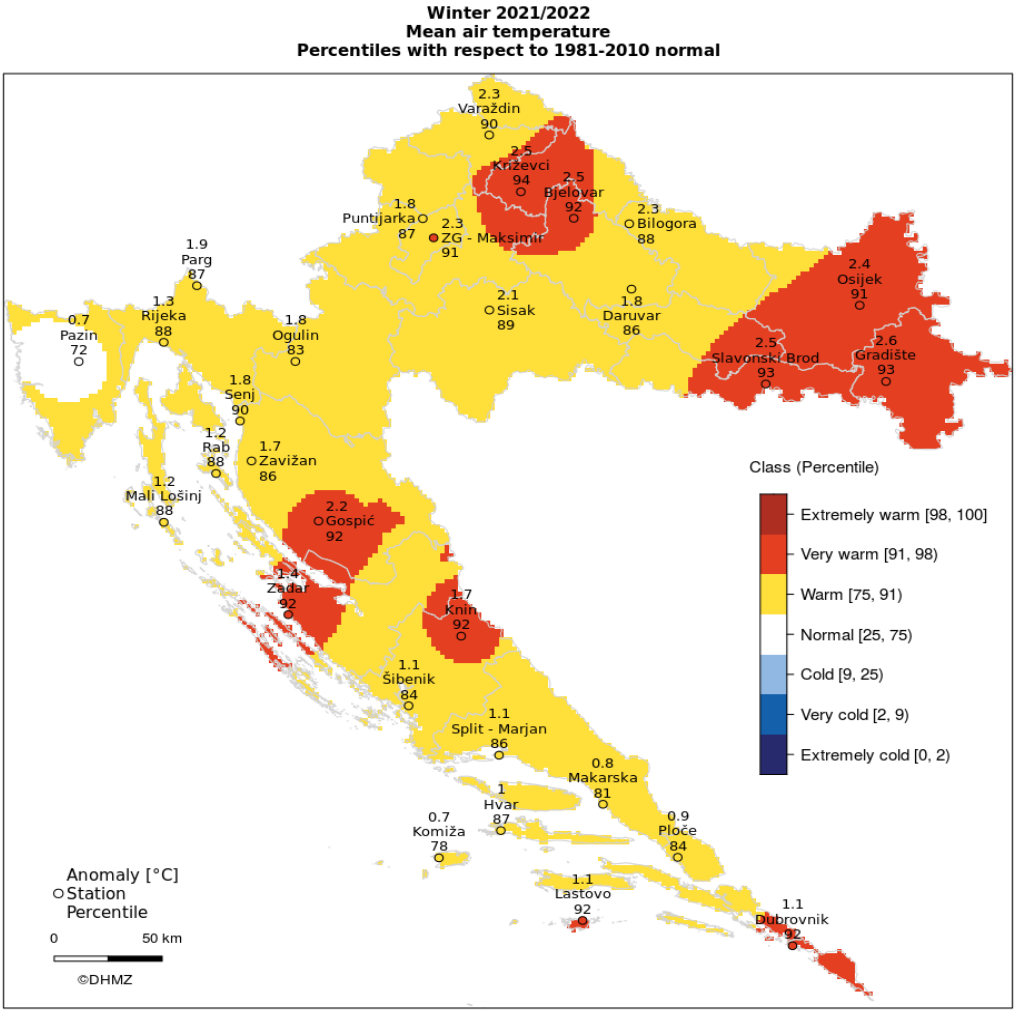
Climate Report for Croatia for Winter 2021/2022

Air temperature anomalies for Croatia in Winter 2021/2022

The average winter air temperature (December 2021, January 2022, February 2022) throughout Croatia was above the multi-annual average (1981 - 2010). Corresponding air temperature anomalies for winter 2021/2022 were within the range from 0.7 °C (Pazin i Komiža) to 2.6 °C (Gradište).

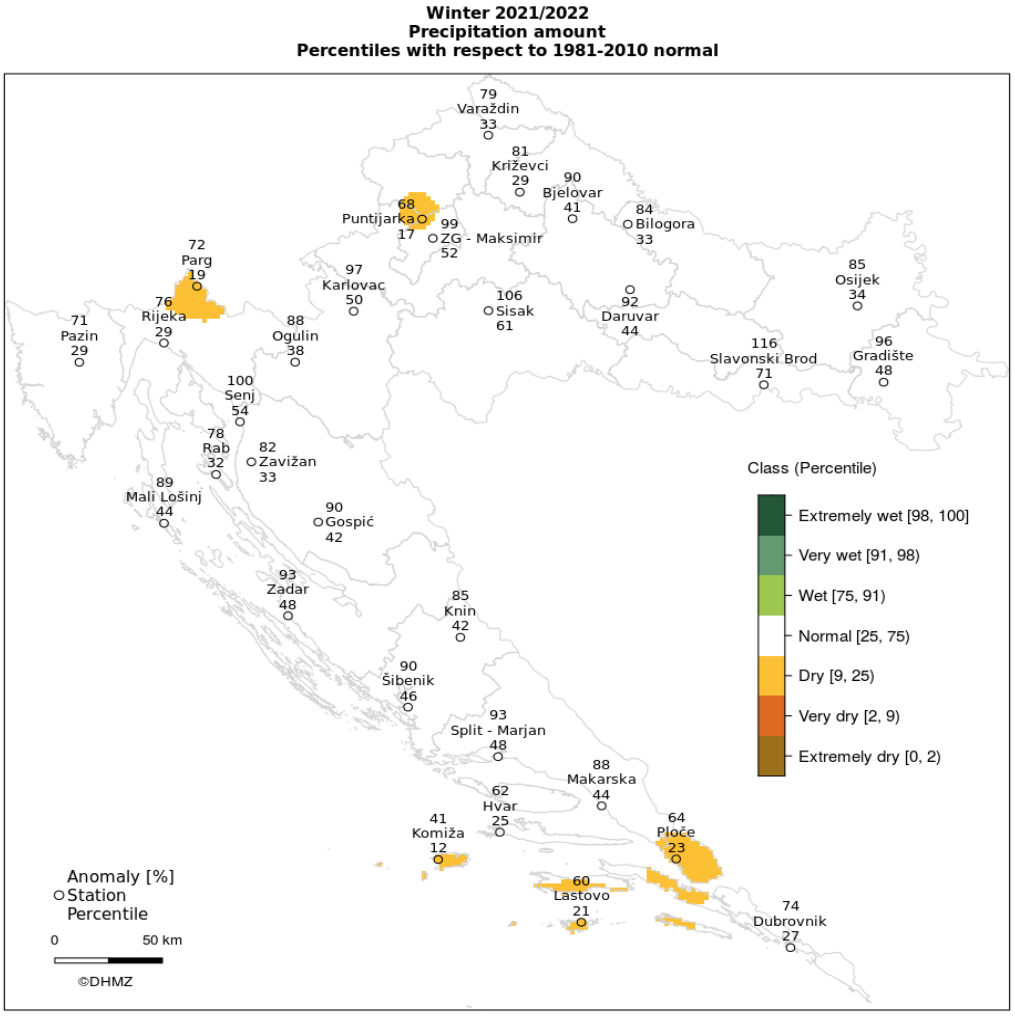
According to percentile ranks and classification ratings, thermal conditions in Croatia for winter 2021/2022 have been described by the following categories: **normal** (majority of Istra), **warm** (west part of Eastern Croatia, most of Central Croatia, the mountain Croatia except the wider area of town Gospić and south part of Velebit and the majority of the coastal area) and **very warm** (the rest of Croatia).



Precipitation amount anomalies for Croatia in Winter 2021/2022

An analysis of the precipitation amounts for winter 2021/2022 expressed as percentages (%) of 1981 - 2010 average, shows that these precipitation amounts were mainly below the average. Corresponding precipitation amounts for winter 2021/2022 were within the range of 41 % (Komiža – 104,4 mm) to 116 % (Slavonski Brod – 171,4 mm) of the multi-annual average for this season.

According to percentile ranks and classification ratings, the precipitation amounts for winter 2021/2022 have been described by the following categories: **dry** (the wider area of Puntijarka, Parg, Vis, Ploče and the islands of south Dalmatia and the part of island Pelješac) and **normal** (the rest of Croatia).



Air temperature anomalies for Croatia in December 2021

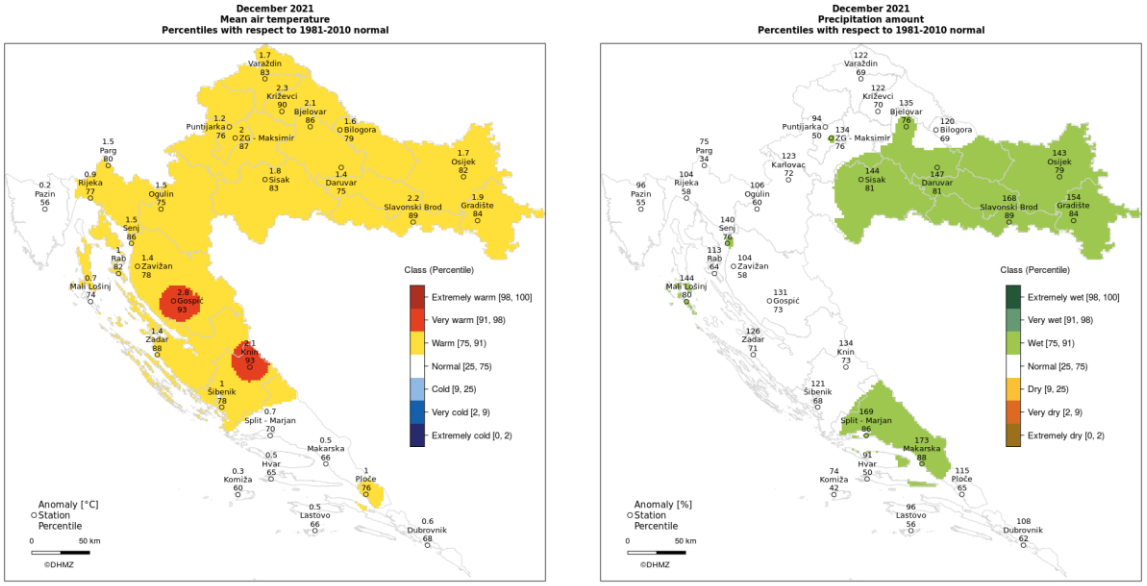
The anomalies of the mean air temperature in December 2021 with respect to the normal 1981 - 2010 were within the range from 0.2 °C (Pazin) to 2.8 °C (Gospić). At all stations air temperature were higher than the respective multi-annual average.

According to the percentile ranks and classification ratings, thermal conditions in Croatia for December 2021 are described in the following categories: **normal** (Istra, central Dalmatia except area around Ploče and south Dalmatia), **warm** (the eastern, central and mountainous part of Croatia except area around Gospić, Kvarner with islands and the north Dalmatia except wider area of Knin) and **very warm** (wider area of Gospić and Knin).

Precipitation anomalies for Croatia in December 2021

Precipitation anomalies expressed as a percentage (%) of the multi-annual average were in December 2021 within the range from 74 % in Komiža (precipitation amount of 80 mm) to 173 % in Makarska (221.3 mm). Analysis of precipitation anomalies in December 2021, expressed as a percentage (%) of the multi-annual average shows that precipitation amounts were above the multi-annual average at the most stations.

Precipitation conditions in December 2021 are described in more detail in the following categories: **normal** (most of the central Croatia, the mountainous Croatia, Istra, the north Adriatic, north Dalmatia, islands of central and south Dalmatia) and **wet** (the rest of Croatia).



Mean air temperature (left) and precipitation amount (right) - December 2021 - percentiles with respect to 1981-2010 normal

Air temperature anomalies for Croatia in January 2022

The anomalies of the mean air temperature in January 2022 with respect to the normal 1981 - 2010 were within the range from 0.1 °C (Pazin) to 2.0 °C (Gradište). At all stations air temperature were higher than the respective multi-annual average. Absolute maximum temperatures were recorded at five stations in January (Dubrovnik, Slavonski Brod, Knin, Daruvar and Zavižan – Table 1).

According to the percentile ranks and classification ratings, thermal conditions in Croatia for January 2022 are described in the following categories: **normal** (almost the entire Croatia) and **warm** (the eastern part of Croatia and area of Puntijarka).

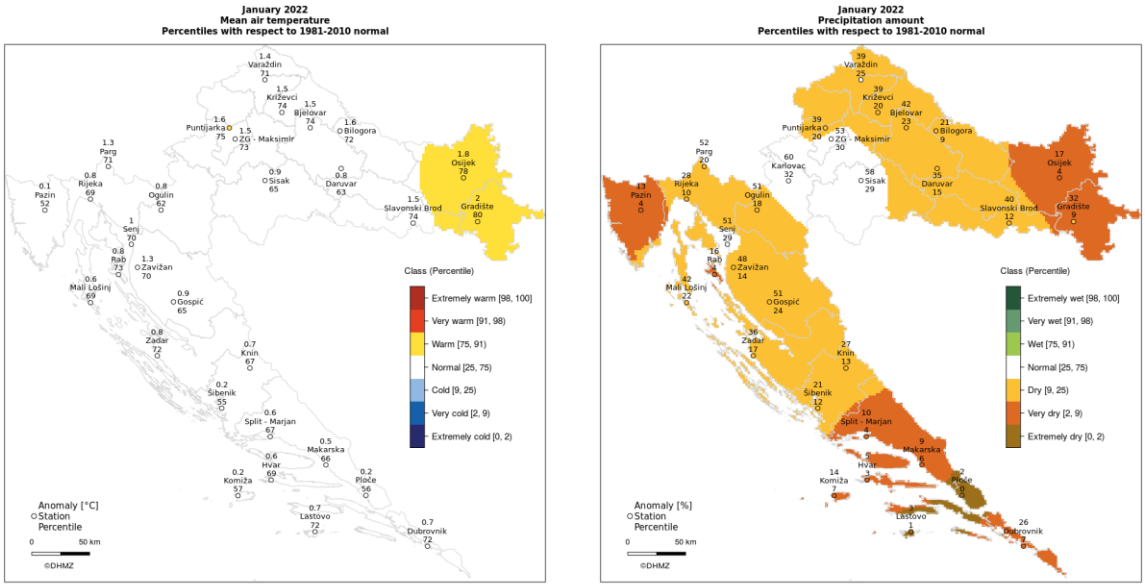
Table 1 - Absolute maximum temperature in January 2022 and comparison with available series of measurement (these stations are included in the analysis of climate anomalies in Croatia)

Naziv meteorološke postaje	Godina od kada su raspoloživi podaci	Vrijednost najviše izmjerene temperature (°C) u siječnju (do 2021.) u razdoblju od kada su raspoloživi podaci	Datum kada je postignuta najviša vrijednost (* označava nepotpuni niz)	Vrijednost najviše izmjerene temperature (°C) u siječnju 2022.	Datum kada je postignuta vrijednost najviše izmjerene temperature u siječnju 2022.
Dubrovnik	1961.	18.4	13.1.1997.*	19.2	2.1.
Senj	1948.	20.3	20.1.1974.*	16.1	5.1.
Šibenik	1949.	21.4	31.1.1989.	16.1	5.1.
Slavonski Brod	1963.	19.4	19.1.2007.	19.5	5.1.
Knin	1949.	20.5	20.1.2007.	21.6	1.1.
Rijeka	1948.	20.0	20.1.1974.	14.9	14. i 15.1.
Karlovac	1949.	19.3	7.1.2001.	17.3	5.1.
Osijek	1899.	19.0	11.1.1903.*	17.6	5.1.
Hvar	1858.	19.6	30.1.1949.*	18.7	15.1.
Pazin	1961.	21.4	31.1.1989.	16.9	1.1.
Split - Marjan	1948.	17.4	20.1.1974.	15.9	15.1.
Ogulin	1949.	19.8	17.1.2011.	18.0	2.1.
Komiža	1981.	20.2	10.1.2016.	17.0	2. i 15.1.
Sisak	1949.	21.4	7.1.2001.	18.7	5.1.
Daruvar	1978.	18.8	23.1.1985.	18.8	5.1.
Mali Lošinj	1961.	17.4	20.1.2007.	14.6	5.1.
Poreč	1981.	16.6	19.1.2014.*	14.6	5.1.
Zagreb - Maksimir	1949.	19.4	7.1.2001.	16.5	5.1.
Bjelovar	1949.	17.8	28.1.1979.	17.0	5.1.
Varaždin	1949.	19.1	29.1.2002.	16.0	1.1.
Gospić	1872.	16.0	19.1.2007.*	13.7	1. i 2.1.
Lastovo	1948.	19.3	15.1.1993.*	17.3	2.1.
Zadar	1961.	17.4	10.1.2016.	16.0	15.1.
Parg	1950.	17.8	29.1.2002.*	15.4	1.1.
Puntijarka	1981.	14.1	29.1.2002.	13.8	1.1.
Zavižan	1953.	12.5	16.1.1993.*	13.0	1.1.

Precipitation anomalies for Croatia in January 2022

Precipitation anomalies expressed as a percentage (%) of the multi-annual average were in January 2022 within the range from 2 % in Ploče (with precipitation amount of 1,9 mm) to 60 % in Karlovac (40,5 mm). Analysis of precipitation anomalies in January 2022, expressed as a percentage (%) of the multi-annual average shows that precipitation amounts were below the multi-annual average at all stations.

Precipitation conditions in January 2022 are described in more detail in the following categories: **extremely dry** (wider area of Ploče, island Pelješac and islands of south Dalmatia), **very dry** (the eastern part of Croatia, Istra, Rab, the central Dalmatia, coast of south Dalmatia), **dry** (part of eastern and central Croatia, the mountainous Croatia, the north Adriatic (except Rab), the north Dalmatia with hinterland) and **normal** (the rest of Croatia).



Mean air temperature (left) and precipitation amount (right) - January 2022- percentiles with respect to 1981-2010 normal

Air temperature anomalies for Croatia in February 2022

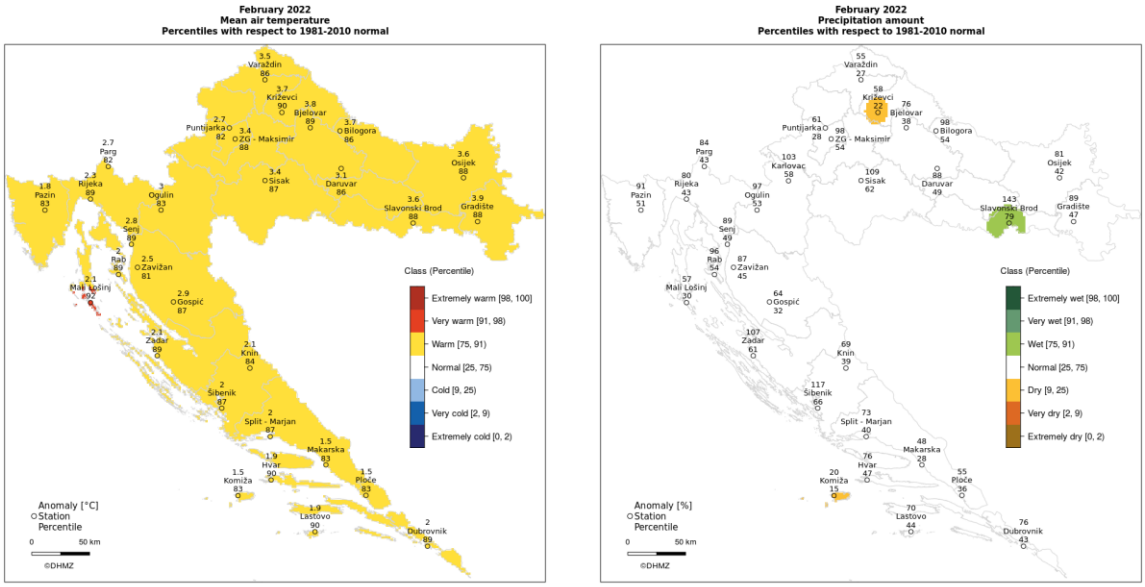
The anomalies of the mean air temperature in February 2022 with respect to the normal 1981 - 2010 were within the range from 1.5 °C (Makarska, Komiža, Ploče) to 3.9 °C (Gradište). At all stations air temperature were higher than the respective multi-annual average.

According to the percentile ranks and classification ratings, thermal conditions in Croatia for February 2022 are described in the following categories: **warm** (almost the entire Croatia) and **very warm** (the wider area of Lošinj and the south part of island Cres).

Precipitation anomalies for Croatia in February 2022

Precipitation anomalies expressed as a percentage (%) of the multi-annual average were in February 2022 within the range from 20 % in Komiža (with precipitation amount of 13,5 mm) to 143 % in Slavonski Brod (53,6 mm). Analysis of precipitation anomalies in February 2022, expressed as a percentage (%) of the multi-annual average shows that precipitation amounts were mainly below the multi-annual average, only at 5 stations were above.

Precipitation conditions in February 2022 are described in more detail in the following categories: **dry** (wider area of Križevci and island Vis), **normal** (almost the entire Croatia) and **wet** (wider area of Slavonski Brod).



Mean air temperature (left) and precipitation amount (right) - February 2022- percentiles with respect to 1981-2010 normal

SEECOF-26 CLIMATE OUTLOOK VALIDATION

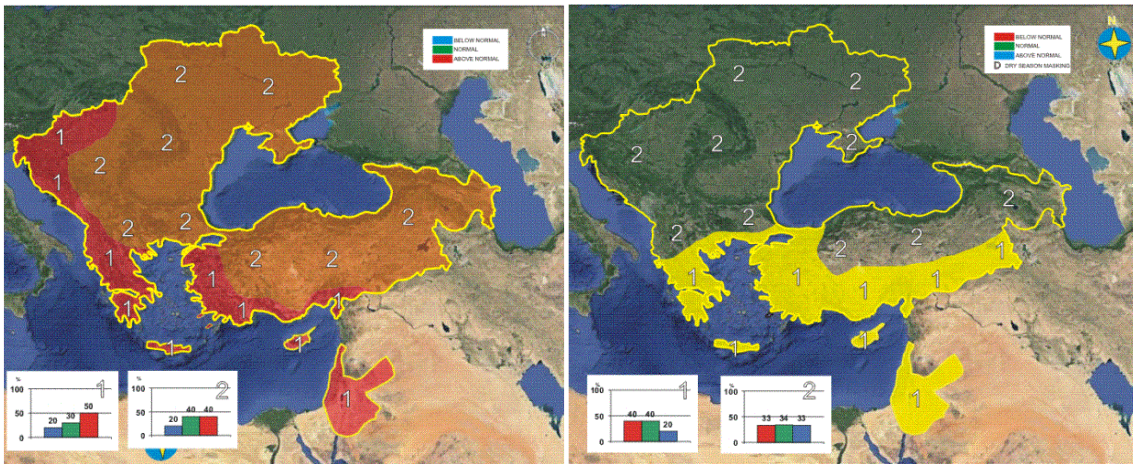


Figure 1: Graphical presentation of the climate outlook for the 2021-2022 winter season for the SEECOF region; Temperature outlook (left), Precipitation outlook (right)

Air temperature anomalies for Croatia in Winter 2021/2022

According to the SEECOF-26 climate outlook, for all Croatian teritory, winter temperature was expected to be likely above normal. Probability for exceeding the average summer season temperature alonge the Adriatic coast and their hinterland was 50 %, and in the rest of Croatia was 40 %.

We can conclude that the outlook for the Winter 2021/2022 according the temperature was correct.

Precipitation amounts for Croatia in Winter 2021/2022

According to the SEECOF-26 climate outlook, winter precipitation sum in the whole Croatia had no privileged scenario, which means that climatology (middle tercile) had to be taken as the most likely result.

The actual precipitation amounts were mainly below the average. Only in some part of Croatia the precipitation amounts were around the average.

We can conclude that the outlook for the Winter 2021/2022 according the precipitation was correct in some, smaller part, of Croatia.

Country	Seasonal temperature (DJF)		Seasonal precipitation (DJF)		High Impact Events
	Observed	SEECOF-26 climate outlook for **temperature**	Observed	SEECOF-26 climate outlook for **precipitation**	
Croatia	**Above normal**	**Above normal** along the Adriatic coast and their hinterland (20,30,50) in the rest of Croatia (20,40,40)	**Below normal** (in most of Croatia) **Normal** (part of Eastern Croatia)	**No predictive signal** (33,34,33)	**Winter 2021/2022** **Wind** – a few episodes (mostly in January and February) with gale and hurricane force gusts of bura wind (NE wind) was recorded along the Adriatic coast. In January (on 10th and 11th), sea and road traffic between continental part and Adriatic coast were complitely interrupted. There was damages on houses, fields and roads. There were casualties - one man died. On 11th January at Krk bridge (the north Adriatic), wind gusts of 180 km/h was measured. Simillar situation was on 26th and 27th February when gusts of bora wind at Krk bridge was 195 km/h. **Precipitation** On 5th and 26 th December, around Split (Dalmatia and its hinterland), after heavy rain (50 to 60 mm of rain), flash floods were observed. Many houses, fields and roads were flooded. In February, on 7th and 15th heavy thunderstorms hit north Dalmatia and its hinterland with heavy precipitation and hail. There was damages on houses, cars, olive groves and roads. At north Adriatic waterspout was observed.

					Cold wave In January, at the end of the month, cold wave hit Dalmatia. The sea near Šibenik froze. On 25th, minimum temperature in the hinterland of Dalmatia, in Sinj, was -11,4 °.