

# Public weather warning system of the Hungarian Meteorological Service

## Aim of the warning system

The Hungarian Meteorological Service (OMSZ) operates a weather warning system in order to protect lives and properties, which is available on the OMSZ public website ([www.met.hu/en/idojaras/](http://www.met.hu/en/idojaras/)). The main purpose of the system is to ensure reliable sources of information before or during critical weather situations. The warning information is available on [www.met.hu/en/idojaras/veszelyjelzes/](http://www.met.hu/en/idojaras/veszelyjelzes/) or [veszelyjelzes.met.hu](http://veszelyjelzes.met.hu) websites. The websites show coloured maps, which enable users to quickly recognize areas affected by hazardous weather phenomena. By clicking on the map, one can obtain more detailed information in text form, about the expected weather risks in a given region.

## How does the warning system work?

### *a. Pre-warning and warning*

Pre-warnings and warnings are issued for following weather phenomena:

- severe thunderstorm,
- torrential rain,
- wind gust,
- freezing rain,
- blowing snow.

In cases mentioned above, the severe weather information is provided in two steps.

- In the **first step**, a **pre-warning** information is issued in both **text and map** form, which is valid **for today and tomorrow**, in which we can find the description of the likeliest spatial and temporal evolution of severe weather phenomena.
- In the **second step**, when the severe weather meteorologist recognizes (upon measurements, observations, numerical weather prediction models) that the weather conditions are favourable for occurrence of severe phenomena, already indicated in the pre-warning, **warning (alert) is issued in map form, usually half an hour to three hours before the event**. It depends on the type of the severe weather or on the weather situation, whether the warning can be issued a few hours before the event will start to form, or only at the beginning of its evolution.

In general, the area, on which pre-warnings and warnings are issued, varies in size but the smallest area, for which the forecasts apply, is usually equivalent to half of an average county in Hungary.

### *b. Warnings on snowfall and large amount of rain*

Warnings on **long-lasting, large amount of rain or snowfall** are issued in case that the event will occur on area of size equivalent to the territory of an average county in Hungary. **Very short-range warnings (alerts) on these phenomena are not issued!**

### *c. Special warnings*

**Special warnings** used to be issued on **heat, on extremely cold weather** or on the **possibility of long-lasting dense fog** occurrence in case that the event will occur on area of size equivalent to the territory of an average county in Hungary. **Very short-range warnings on these phenomena are not provided either!**

### **Warning levels**

**Three warning levels are distinguished for both pre-warnings and warnings.** If no severe phenomena are expected, which would meet the criteria, the area on the map appears in green colour.

#### **First level (yellow)**

The weather events in this category are not unusual but can be potentially dangerous, that is why it is recommended to be cautious, above all during weather-exposed activities. Especially in case of uncertain weather evolution and rapid change of weather situation it is advisable to follow weather information more frequently and in more details than usually.

#### **Second level (orange)**

Severe weather phenomena, which can, eventually, lead to damage, or even cause personal injury or accidents. In case of warning, be very careful, take care of your safety and your valuables. Follow the news and details of the weather evolution. Follow the advices of reliable media and instructions of the authorities.

#### **Third level (red)**

Dangerous weather events, causing serious damage, threatening human life in many cases, usually involving extensive areas. In case of warning, be especially careful, take great care of your safety and your valuables. Constantly monitor the most recent official weather information. Follow the instructions of the authorities at all times. Stay in a safe place. The highest (red) level of severe weather warning is issued only in case of very rare events.

- Pre-warning and warning on severe weather events

Severe weather event	Symbol		Short description
<b>Severe thunderstorm</b>		1	Small probability of severe thunderstorm (accompanied by wind gusts exceeding 90 km/h or large hail).
		2	Medium probability of severe thunderstorm (accompanied by wind gusts exceeding 90 km/h or large hail).
		3	High probability of severe thunderstorm (accompanied by wind gusts exceeding 90 km/h or hail).
<b>Torrential rain</b>		1	Exceeding 25-30 mm of precipitation from intense shower or thunderstorm within a short period.
		2	Exceeding 50 mm of precipitation from intense shower or thunderstorm within a short period.
<b>Wind gust</b>		1	Expected wind gust exceeding 70 km/h.
		2	Expected wind gust exceeding 90 km/h.
		3	Expected wind gust exceeding 110 km/h.
<b>Freezing rain</b>		1	Slight freezing rain. Predicted amount of precipitation is only a few tenths of mms (>0.1 mm).
		2	Freezing rain lasting several hours. Predicted amount of precipitation exceeding 1 mm.
		3	Freezing rain lasting several hours. Predicted amount of precipitation exceeding 5 mm.
<b>Blowing snow</b>		1	Blowing snow of weak intensity, causing small snowdrifts in the area covered by fresh snow.
		2	Blowing snow causing medium-size snowdrifts in the area covered by fresh snow.
		3	Blowing snow of high intensity causing large snowdrifts in the area covered by fresh snow.

- **Warning related to snowfall and large amount of precipitation**

Severe weather event	Symbol	Short description	
<b>Rain</b>		1	More than 20 mm during 24 hours.
		2	More than 30 mm during 24 hours.
		3	More than 50 mm during 24 hours
<b>Snowfall</b>		1	More than 5 cm of fresh snow during 12 hours.
		2	More than 20 cm of fresh snow during 24 hours.
		3	More than 30 cm of fresh snow during 24 hours.

- **Special warning related to some severe weather events**

Severe weather event	Symbol	Short description	
<b>Extremely cold</b>		1	Temperature can drop below -15 °C.
		2	Temperature can drop below -20 °C.
		3	Temperature can drop below -25 °C.
<b>Extremely warm</b>		1	Daily mean temperature likely reaches or exceeds 25 °C.
		2	Daily mean temperature likely reaches or exceeds 27 °C.
		3	Daily mean temperature likely reaches or exceeds 29 °C.
<b>Long-lasting dense fog</b>		1	Long-lasting (> 6 hours) dense fog is expected (visibility is only a few hundred meters).

## **Additional, important information**

The weather forecasts and warnings are always valid for a period of time and not for a specific time. Furthermore, the forecasts and warnings concern expected intensity of meteorological phenomena and probability of their occurrence, not their direct or indirect consequences (e.g. floods) and related damages or accidents.

In complicated weather situations, it may happen that more, different types of severe weather appear at once, on the same territory. In that case, pre-warning is issued on each weather element (from the tables above), which occurrence can be expected on the given day (at any time, from 0 to 24 hour of that day).

There is also a pre-warning for ordinary (not severe) thunderstorms (chance of lightning) only in the text.

Warnings are usually issued with lead-time of 0.5-3 hours. However, dependent on the weather situation, the warning, once issued, can remain valid for 3 to 6, or even up to 12 hours. In most of the cases, after such time, the warnings are either updated or cancelled. Because warning is a forecast product, it can be modified, updated anytime, upon most recent data and information.

A full picture of severe weather situation can be obtained by checking of all elements of the warning system (map warnings, text and map pre-warnings).

Severe weather warnings for Europe in map form are available on the [www.meteoalarm.eu](http://www.meteoalarm.eu) website.

Many severe weather events (e.g. thunderstorms) have local character and their development, propagation or intensity is often uncertain. Hence, if a severe weather warning is issued for a region, it does not necessarily mean that the event takes place at every point of the area highlighted on the map. E.g., when there is a risk of severe thunderstorm occurrence in our region, it means that the event **can occur** in the **environment of the point**, where we are - which radius is approximately 30 km (*see the figure below*). Such area nearly corresponds to half of the size of the territory of an average Hungarian county. For large-scale weather events (e.g. in case of propagating atmospheric fronts and systems of thunderstorms), the probability of being hit by severe weather increases and this is usually expressed by the colour of the warning as well (by orange or red warning the probability of occurrence of the event at certain point is higher than by yellow warning).



*Approximate (minimum) size of the territory (marked by blue circle),  
for which the warnings or pre-warnings are valid in case of a local severe weather event  
(~30 km radius or 2800 km<sup>2</sup>).*

Due to high temporal and spatial variability of the weather and due to limits of the contemporary forecasting tools (numerical models, nowcasting systems) and observation systems, it is not possible to specify and depict the occurrence of severe weather phenomena with absolute precision. The warning maps provide a schematic representation of the weather situation and of its likely, future development. Thus, **the pre-warning and warning does not guarantee that certain severe weather event occurs at a certain point of the area in question!**

The OMSZ, in collaboration with other partners, operates special wind forecasting and alerting systems in areas, which are especially important from the life and property protection point of view (e.g. storm-warning on the lakes Balaton, Velence and Tisza).