

## THUNDERSTORMS RISK

Thunderstorms are assessed, organised into medium/large structures, with significant characteristics in terms of duration, area affected and intensity, which can also give rise to heavy rain, lightning, strong gusts of wind and hail.

Since 'such phenomena are inherently characterised by high forecast uncertainty in terms of location, timing and intensity, they cannot be reliably predicted quantitatively', meteorological indicators of storm danger are assessed during the forecasting phase on the basis of meteorological conditions favourable to the development of storms: the spatial size, persistence and characteristics of the forecast storm cells are taken into account.

The colour code for thunderstorms is assessed during the forecasting phase on the basis of alert areas aggregated by macro-areas (A, B, C, D, E, F, G, H) in order to mediate the spatial and temporal uncertainty inherent in the forecast, and is divided into only three levels: green, yellow and orange. There is no red colour code because thunderstorms are, by their nature, phenomena that are localised in time and space, which are not generally associated with scenarios of events extending over the territory, typical of red code alerts.

In the event of storms characterised by heavy or very heavy and persistent rainfall, landslides and torrential phenomena may occur in the area, 'similar to what is expected for the hydrogeological scenario, but with phenomena characterised by high intensity and rapid evolution,' as specified in the table of event scenarios related to storms.

During the event, on an experimental basis, thresholds of 30 mm/h and 70 mm/3h were identified on the rain gauges, the exceeding of which may indicate the presence of storms with heavy or very heavy and persistent rainfall.

The event scenarios and the possible effects and damage to the territory corresponding to the different colour codes from green to orange are summarised in the following table.

THUNDERSTORMS RISK		
COLOUR CODE	EVENT SCENARIO	POSSIBLE EFFECTS AND DAMAGE
GREEN	<ul style="list-style-type: none"> <li>- No foreseeable storms.</li> <li>- Scattered storms, of short duration, with possible associated effects, even if not simultaneous, such as lightning strikes, hail, isolated gusts of wind, and rain that may cause occasional flooding or landslides of limited extent.</li> </ul>	Unpredictable, occasional damage cannot be ruled out.
YELLOW	<p><b>Conditions are favourable for the development of thunderstorms characterised by high intensity and rapid evolution (average duration 1 hour), with probable associated effects, even if not simultaneous, of lightning strikes, hail, gusts of wind and heavy rain.</b></p> <p>Heavy rainfall may cause:</p> <ul style="list-style-type: none"> <li>- localised flooding, with surface water runoff, backflow or overflow of rainwater drainage systems;</li> <li>- in hilly and mountainous alert areas, localised runoff with erosion, transport and sedimentation, landslides due to collapse (including isolated boulders) and rapid flows;</li> <li>- rapid rises in water levels with bank erosion, sedimentation and solid transport along minor rivers and streams and possible flooding of neighbouring areas.</li> </ul>	<p>Occasional danger to human safety with possible loss of life due to accidents.</p> <ul style="list-style-type: none"> <li>- Localised flooding in urban areas in basements and ground floor premises along roads potentially affected by water runoff (e.g. underpasses).</li> <li>- Localised damage to infrastructure, buildings and agricultural activities, construction sites, civil and industrial settlements affected by landslides or surface water runoff or near minor rivers and streams.</li> <li>- Localised damage to roofs and temporary structures with transport of materials due to strong gusts of wind or tornadoes.</li> <li>- Localised broken branches, fallen trees and knocked-down poles, signs and scaffolding with consequent effects on traffic and overhead communication and service distribution networks (in particular telephony and electricity), possible uprooting of trees in the event of tornadoes.</li> <li>- Localised damage and danger to people's safety due to the presence of debris and material lifted into the air and falling back down in the event of tornadoes.</li> <li>- Localised damage to crops, building roofs and vehicles due to hailstorms.</li> <li>- Localised fires and injuries caused by lightning strikes.</li> </ul>

THUNDERSTORMS RISK		
COLOUR CODE	EVENT SCENARIO	POSSIBLE EFFECTS AND DAMAGE
ORANGE	<p>Conditions are favourable for the development of thunderstorms characterised by high intensity, persistence (average duration 3 hours) and extent, with associated effects, even if not simultaneous, of lightning, hail, gusts of wind and very heavy rain.</p> <p>Very heavy rainfall can cause:</p> <ul style="list-style-type: none"> <li>- widespread flooding, with surface water runoff, backflow or overflowing of rainwater drainage systems;</li> <li>- in hilly and mountainous areas under alert, widespread runoff with erosion, transport and sedimentation, landslides due to collapse (including isolated boulders), slippage and rapid flows;</li> <li>- rapid and significant rises in water levels with bank erosion, sedimentation and solid transport along minor rivers and streams, and flooding of neighbouring areas.</li> </ul>	<p>Danger to human safety with possible loss of life due to accidents.</p> <ul style="list-style-type: none"> <li>- Widespread flooding in urban areas of basements and ground floor premises along roads potentially affected by water runoff (e.g. underpasses).</li> <li>- Widespread damage to road infrastructure, buildings and agricultural activities, construction sites, civil and industrial settlements affected by landslides or surface water flow near minor rivers and streams.</li> <li>- Widespread damage to roofs and temporary structures with transport of materials due to strong gusts of wind or tornadoes.</li> <li>- Widespread broken branches, fallen trees and knocked-down poles, signs and scaffolding, with consequent effects on traffic and overhead communication and service distribution networks (in particular telephony and electricity); possible uprooting of trees in the event of tornadoes.</li> <li>- Widespread damage and danger to people's safety due to debris and material being lifted into the air and falling back down in the event of tornadoes.</li> <li>- Widespread damage to crops, building roofs and vehicles due to hailstorms.</li> <li>- Widespread fires and injuries from lightning strikes.</li> </ul>