

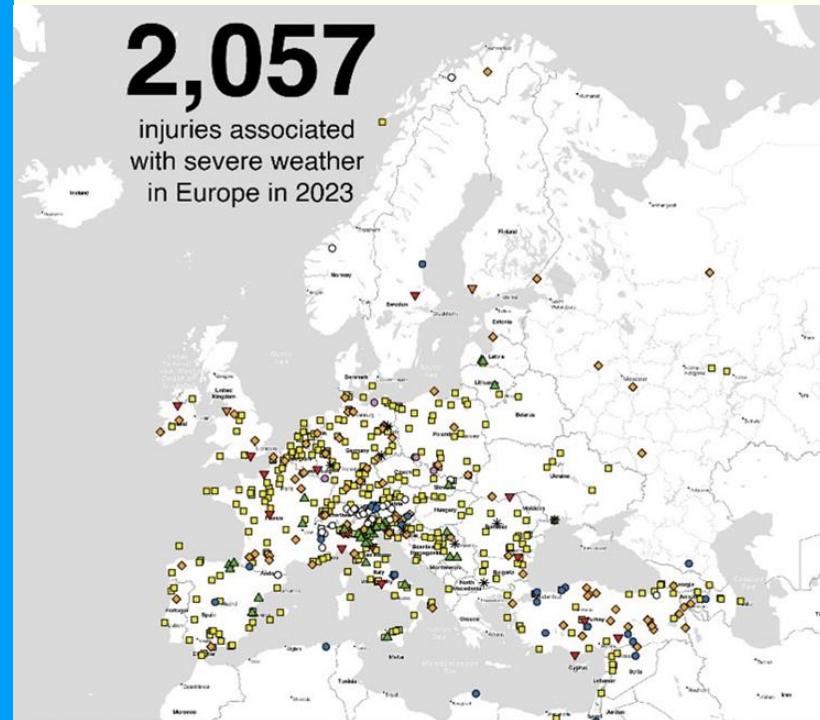


ESWD summary of 2023

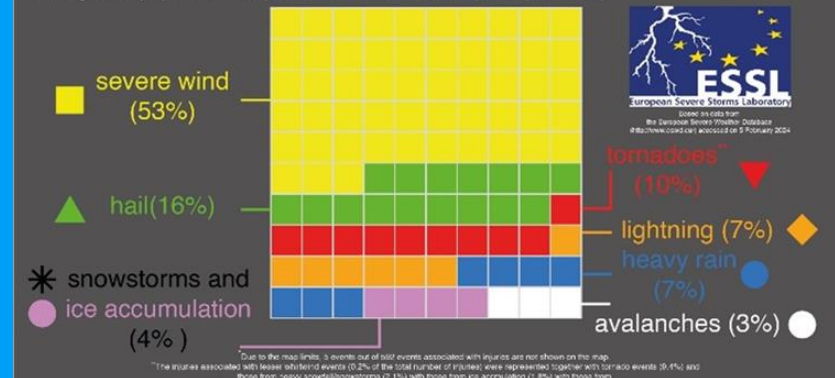
Traditionally, at the beginning of the year ESSL gives an annual overview of the **European Severe Weather Database (ESWD)** reports on severe weather events via our social media accounts ([Twitter](#) and [Facebook](#)).

In 2023, **592 severe weather events resulted in 2,057 injuries**. Severe wind events were associated with the largest number of injuries (375 events resulting in 1,092 injuries). The highest injury rate was reported for tornadoes.

It should be noted that the heavy rain event in Libya (storm Daniel in September) is not included in the statistics but this single event had the largest number of injuries (more than 7,000 injuries).



In 2023, 592¹ severe weather events resulted in 2,057 injuries. Severe wind events were associated with the largest number of injuries (375 events resulting in 1,092 injuries). The largest number of injuries from a single event (more than 7,000 injuries) was reported for a heavy rain event that occurred on September 11 in Darnah, Libya (not included in the statics below). The highest injury rate was reported for tornadoes (12 injuries per event).



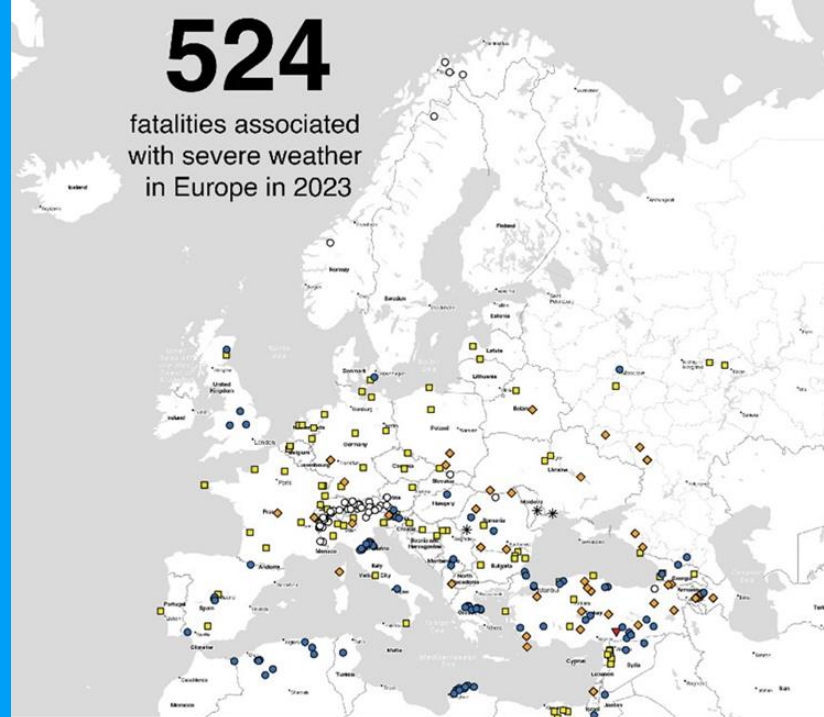
¹Due to the map limits, 3 events out of total events associated with injuries are not shown on the map.
²The injuries associated with severe hail events (0.2% of the total number of injuries) were represented together with hail events (5.4%), and those from heavy snowfall/snowstorms (2.1%) with those from ice accumulation (1.8%) with those from

Unfortunately, **292 severe weather events resulted in 524 fatalities** and the largest number of fatalities was the result of heavy rain events.

Here, also Libya flooding must be highlighted although is not included in the statistics, but the largest number of fatalities from a single event was with this one.

524

fatalities associated
with severe weather
in Europe in 2023



In 2023, **292** severe weather events resulted in **524** fatalities. The largest number of fatalities was produced by heavy rain events (92 events resulting in 251 fatalities). The largest number of fatalities from a single event (more than 20,000 fatalities) was reported for a heavy rain event that occurred on September 11 in Darnah, Libya (not included in the stats below). The highest fatality rate was reported for heavy rain events (2.7 fatalities per event).



** Due to the map limits, 14 events out of 203 events associated with fatalities are not shown on the map. This increased the number of fatalities resulting from avalanches (14%) and heavy/snowstorms (2%).

Large hail – In 2023, **9,818 large hail events** were reported in Europe. This is the largest number of hail events reported in one year since 2006. Large hail was associated with 328 injuries in 2023.

You can read more about Major hailstorms of 2023 in the [Blog](#) written by *Tomáš Půčík*.

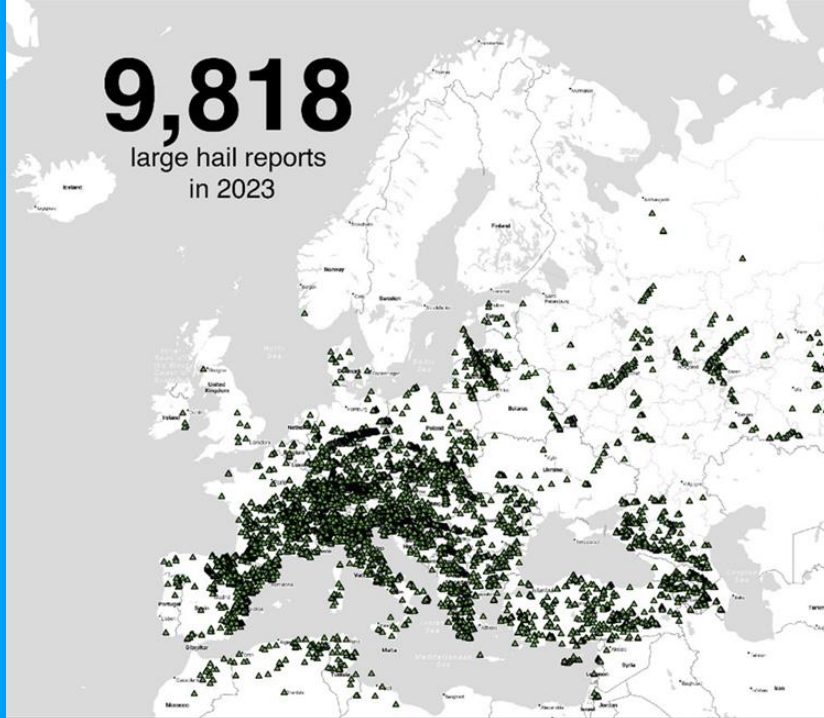
Severe wind – **40,598 severe wind events** were reported in Europe in 2023. This is the largest number of severe wind events reported in one year since 2006. Severe wind events were associated with **115 fatalities and 1,092 injuries in 2023**.

Heavy rain – **8,082 heavy rain events** were reported in 2023 in Europe and also this was the largest number of heavy rain event in one year since 2006. Heavy rain was associated with **20,252 fatalities and 7,142 injuries** in 2023, of which the majority was associated with flooding in Libya on 11 September 2023 (more than 20,000 fatalities and 7,000 injuries).

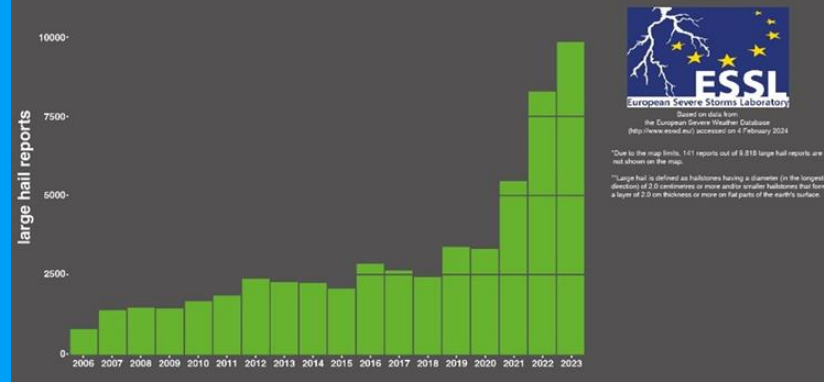
Tornadoes – In 2023, **872 tornadoes** were reported in Europe, causing 3 fatalities and 195 injuries. Most of the events were for tornadoes over water (69%), while 30 % were for tornadoes over land.

9,818

large hail reports
in 2023

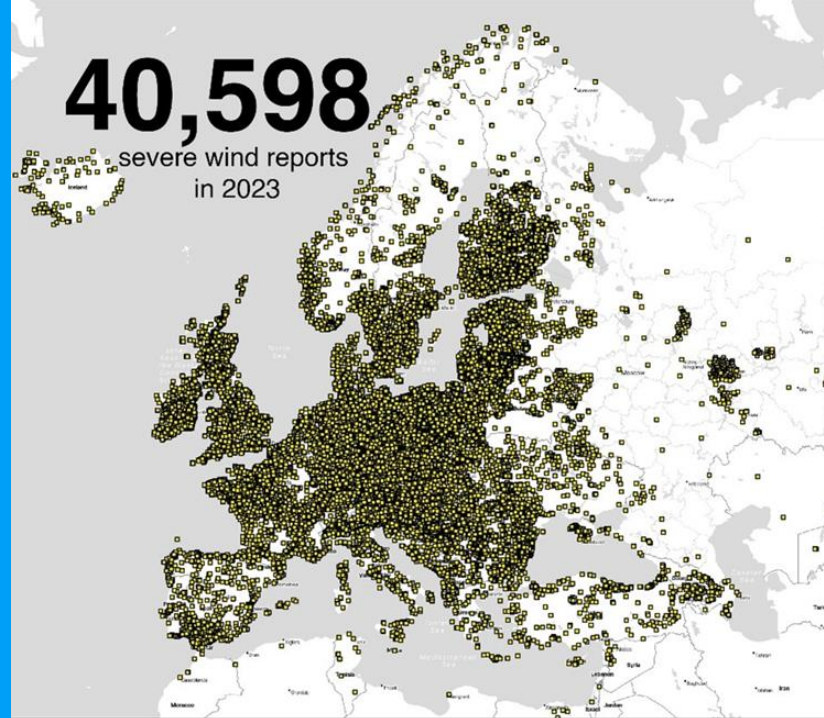


In 2023, **9,818** "large hail" events were reported in Europe. This is the largest number of hail events reported in one year since 2006. Large hail was associated with **328 injuries** in 2023.

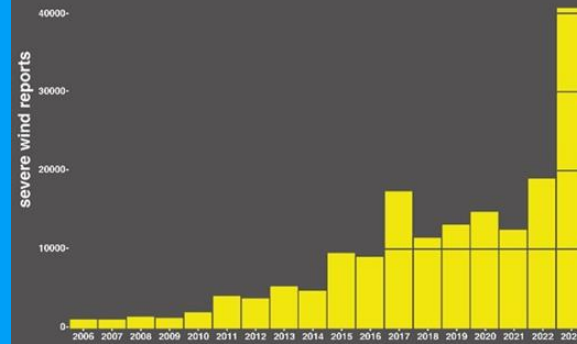


40,598

severe wind reports
in 2023



In 2023, 40,598¹ "severe wind"² events were reported in Europe. This is the largest number of severe wind events reported in one year since 2006. Severe wind events were associated with 115 fatalities and 1,092 injuries in 2023.



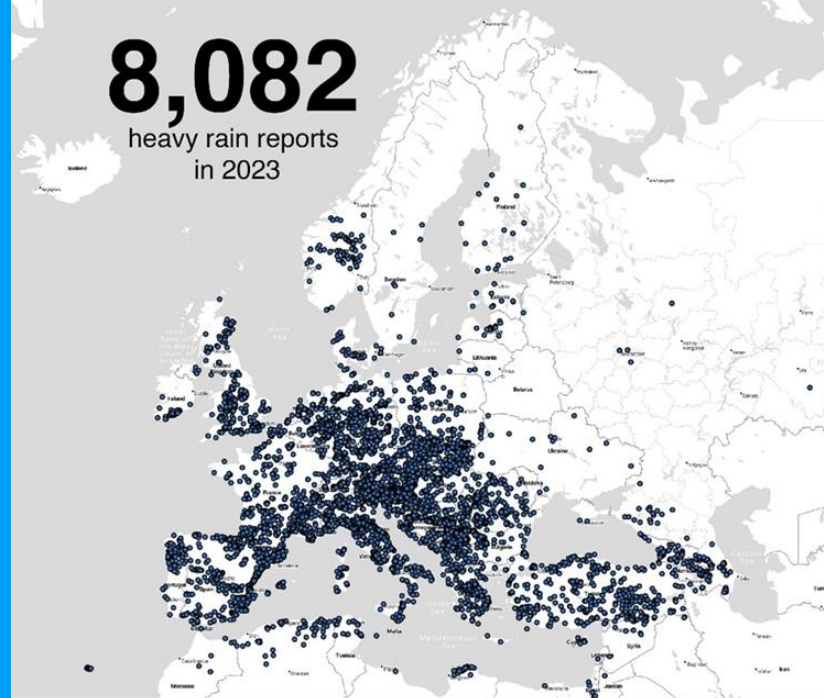
Based on data from
the European Severe Weather Database
(<https://www.euro-severe.com/>) accessed on 4 February 2024

¹Due to the map limits, 137 reports out of 40,598 severe wind reports are not shown on the map.

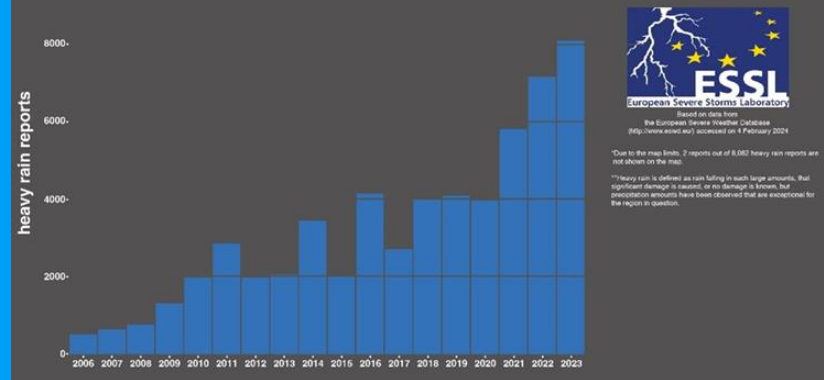
²A severe wind gust is a gust measured to have a speed of at least 20 m/s, or one having such strength that a wind speed of 20 m/s or higher is likely to have occurred.

8,082

heavy rain reports
in 2023

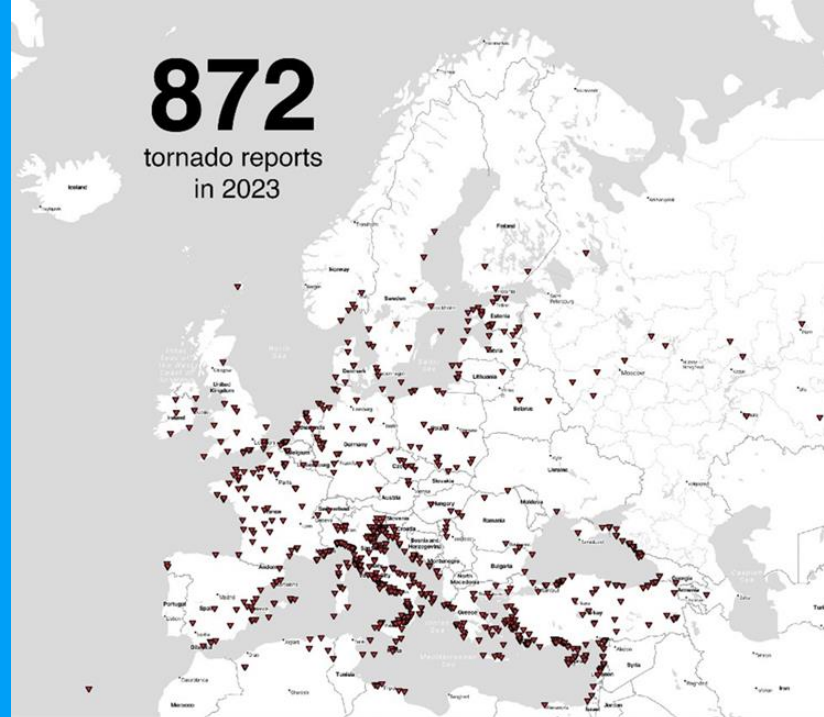


In 2023, **8,082** heavy rain** events were reported in Europe. This is the largest number of heavy rain events reported in one year since 2006. Heavy rain was associated with **20,252 fatalities** and **7,142 injuries** in 2023. The majority of fatalities were associated with a heavy rain event that occurred on 11 September in Darnah, Libya (more than 20,000 fatalities and 7,000 injuries).

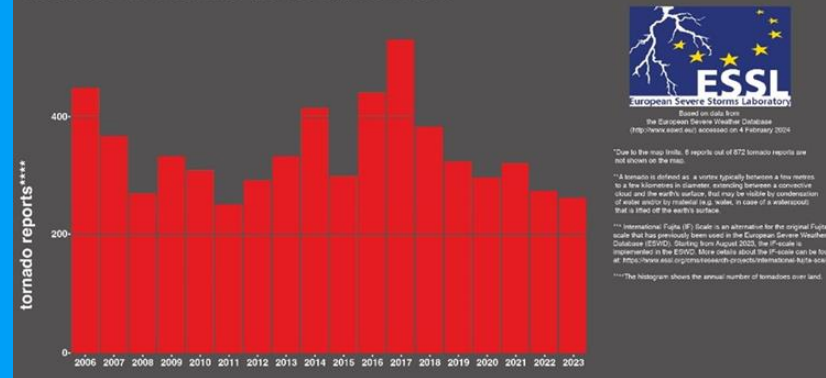


872

tornado reports
in 2023



In 2023, **872^{***} tornadoes** were reported in Europe. 261 reports were for tornadoes (30% of all reports), 599 (69%) for waterspouts and 12 (1%) were not classified because the initial location was unknown. Of the total number of events, 42 were IF0^{****} (5% all tornadoes), 13 IF0.5 (2%), 69 IF1 (8%), 13 IF1.5 (2%), 14 IF2 (2%), 3 IF3 (1%), and 718 (80%) were not classified. Tornadoes were associated with **3 fatalities** and **195 injuries** in 2023.



ESSL training calendar and Testbed 2024

In 2024, in addition to the already traditional and regular courses and workshops, we offer another treat related to Radar Meteorology. You can find details about all events and registration at

<https://www.events.essl.org/>

Hurry up and secure your seat at our most popular workshops!

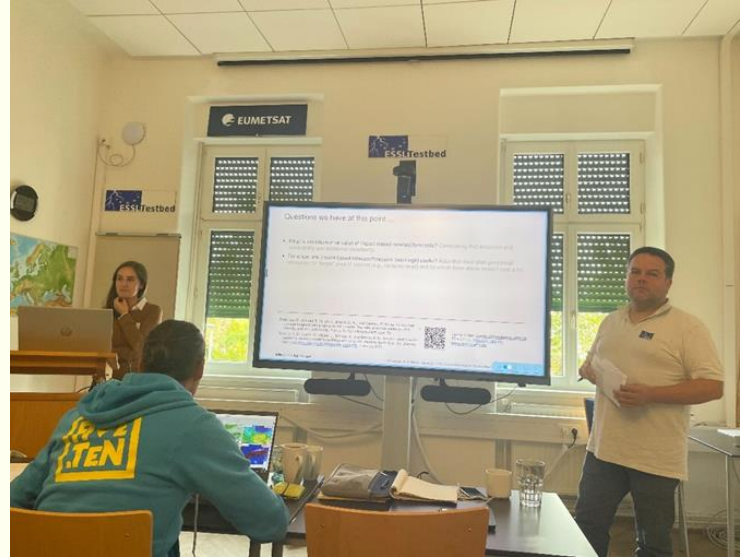
Date	Activity
15 – 19 April 2024	Course Forecasting Severe Convection
22 – 26 April 2024	Course Aviation Forecasting of Severe Convection (spring edition)
13 – 17 May 2024	ESSL-EUMETSAT Testbed 2024 – week 1
3 – 7 June 2024	ESSL-EUMETSAT Testbed 2024 – week 2 (at EUMETSAT headquarters in Darmstadt, Germany)
17 – 21 June 2024	Regular week ESSL Testbed 2024
24 – 28 June 2024	Expert week ESSL Testbed 2024
1 – 5 July 2024	ESSL-EUMETSAT Testbed 2024 – week 3
9 – 13 September 2024	ESSL-EUMETSAT Testbed 2024 – week 4
16 – 20 September 2024	ESSL-EUMETSAT Testbed 2024 – week 5
7 – 11 October 2024	ESSL-EUMETSAT Testbed 2024 – week 6
25 – 29 November 2024	Course: Aviation Forecasting of Severe Convection (autumn edition)
2 – 6 December 2024	NEW with guest lecturer Matt Kumjian Course: Radar Meteorology and Storm Microphysics
9-13 December 2024	<i>Closed event for ARPAL (Italy)</i> Course: Towards better written and oral weather communication
Autumn 2025	12th European Conference on Severe Storms

Warning workshop report

In October 2023 for the first time ESSL organized the Workshop dedicated to weather warnings. One of the most important tasks of National Meteorological Services is issuing warnings about dangerous weather phenomena, and convective storms are often in focus, especially in the warmer part of the year. ESSL team has expertise in this and is eager to share with interested parties, but meteorological experience and knowledge is just one link of the warning chain so it was our goal to bring together experts with various backgrounds including social and human sciences. A multidisciplinary approach is necessary for accurate, timely and well-understood weather warnings.

At the workshop, rather broad set of challenges and problems were addressed and already within the workshop the need for a written report on all open questions, problems as well as possible solutions that emerged as part of the workshop was imposed.

The full report is available [here](#).



Status of preparations for the TIM Field Campaign

ESSL triggered a lot of interest when inviting interested entities to become part of a large **European field campaign on the intensification of severe thunderstorms influenced by complex topography**. As of early February, already **7 national weather services** and **8 research institutions** have signed a **Letter of Interest to become part of this initiative**. This spring, we will organize an online networking meeting for all TIM partners. The year 2024 is dedicated to fundraising activities for the field campaign. A TIM webpage will be launched very soon.



Unsure which course to attend? [Try our online quiz!](#)

For further information about the registration for these events, please contact us at: events@essl.org

Or approach us for [tailored trainings or forecaster training on-the-job](#).



ESSL

European Severe Storms Laboratory

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