ESWD Event reporting criteria

Last revision: May 10, 2014

1. Lesser whirlwinds (dust devils, sand devils, etc.)

Definition

Lesser whirlwinds are vortices not associated with convective storms. They are typically between a few metres to a few tens of metres in diameter and extending upward from the earth's surface but do not reach any cloud. They are rendered visible by material lifted off the earth's surface.

Criteria for inclusion in the ESWD

- Such damage must have produced, that one can assume that a wind speed over 25 m/s has occurred, or a measurement[A] of gust wind speed in excess of 25 m/s must have been made.
- Whirls that develop in the lee of objects (e.g. buildings) are not to be reported.

2. Funnel clouds

Note

Funnel clouds must no longer be reported to the ESWD.

3. Gustnadoes

Definition

Vortices occurring along a gust front of a convective storm, visible by material that is lifted off the earth's surface. They extend upward from the earth's surface but are not connected to a cloud.

Criterion for inclusion in the ESWD

- Such damage must have produced, that one can assume that a wind speed over 25 m/s has occurred, or a measurement[A] of gust wind speed in excess of 25 m/s must have been made.

Note

In case it is uncertain whether the event must be classified as a gustnado, do not select gustnado. If it is certain that either a tornado or gustnado occurred, select "tornado". If a "severe wind gust" may have occurred instead of a gustnado, please select “severe wind gust”.

4. Tornadoes

Definition

A tornado or waterspout is a vortex extending between a convective cloud and the earth's surface, in which the wind is strong enough to cause damage to objects. It may be visible by condensation of water (a funnel cloud) and/or by material (e.g. water, in case of a waterspout) that is lifted off the earth's surface.

Criterion for inclusion in the ESWD

- The definition of a tornado includes only those events in which it is deemed probable that wind speeds of at least 25 m/s occurred. When an observation of a tornado is made that includes the sighting of a funnel cloud reaching the earth’s surface, or a sighting of a funnel cloud aloft with an attendant circulation near the earth’s surface, it is assumed that wind speeds of 25 m/s are occurring in the vast majority of cases. This means that such an event must be reported as a tornado.

Notes

- By the “earth’s surface” we also mean bodies of water, implying that waterspouts (tornadoes over water) are to be treated exactly like tornadoes over land.
- Select "tornado" when a tornado or waterspout is likely to have occurred or in case of doubt between a tornado or gustnado. If it is possible that a "severe wind gust" has occurred instead, select that category.

5. Severe wind gusts

Definition

A severe wind gust is a gust measured[A] to have a speed of at least 25 m/s or one doing such damage that a wind speed of 25 m/s or higher is likely to have occurred.

Note

No distinction is made between wind gusts occurring in association with deep, moist convection, and those occurring in its absence.

6. Large hail

Definition

Hailstones that have a diameter (in the longest direction) of at least 2.0 centimetres, or hailstones that form a layer of 2.0 cm thickness or more on flat parts of the earth's surface.

Criterion for inclusion in the ESWD

Either of the two following criteria must be met:

- Diameter: a hailstone diameter of 2.0 cm or larger must have been measured, or the damage that was caused suggests that this has been the case. The hailstone diameter is the diameter that it has at the moment it impacts the earth's surface or another object. Hailstones that freeze together at a later moment do not count for this criterion.
- Layer thickness: a layer of hail of at least 2.0 cm thickness on a flat surface must have been measured, or the resulting damage suggests this to have been the case. Hail that has accumulated locally by a stream of water, by wind, or any other way do not count for the criterion.

7. Heavy Rain

Definition

Heavy rain defined here as rain falling in such large amounts, that significant damage is caused, or no damage is known, but exceptionally high precipitation amounts have been observed within a period of at most 24 hours. Extreme rainfall on consecutive days must be reported separately in at most 24 hour periods.*

Criterion for inclusion in the ESWD

The event must have caused an extreme impact, or a measurement* of extreme rainfall must be given.

Extreme impact

An extreme impact has occurred if:

- Important streets have become impassable
- Rail, tram or subway transport is disrupted
- Multiple structures or their basements have been flooded
- Landslides have occurred, which caused significant damage to structures or vegetation
- Fire department have come into action multiple times

These impacts may however not be caused by:

- flooding along rivers
- flooding owing to a combination of thaw and rain
- falling rocks to which the rainfall may have contributed

If traffic accidents occur due to water on a street (e.g. because of aquaplaning), but the street is still passable, this is not considered an extreme impact.

*** Measurement of extreme rainfall**

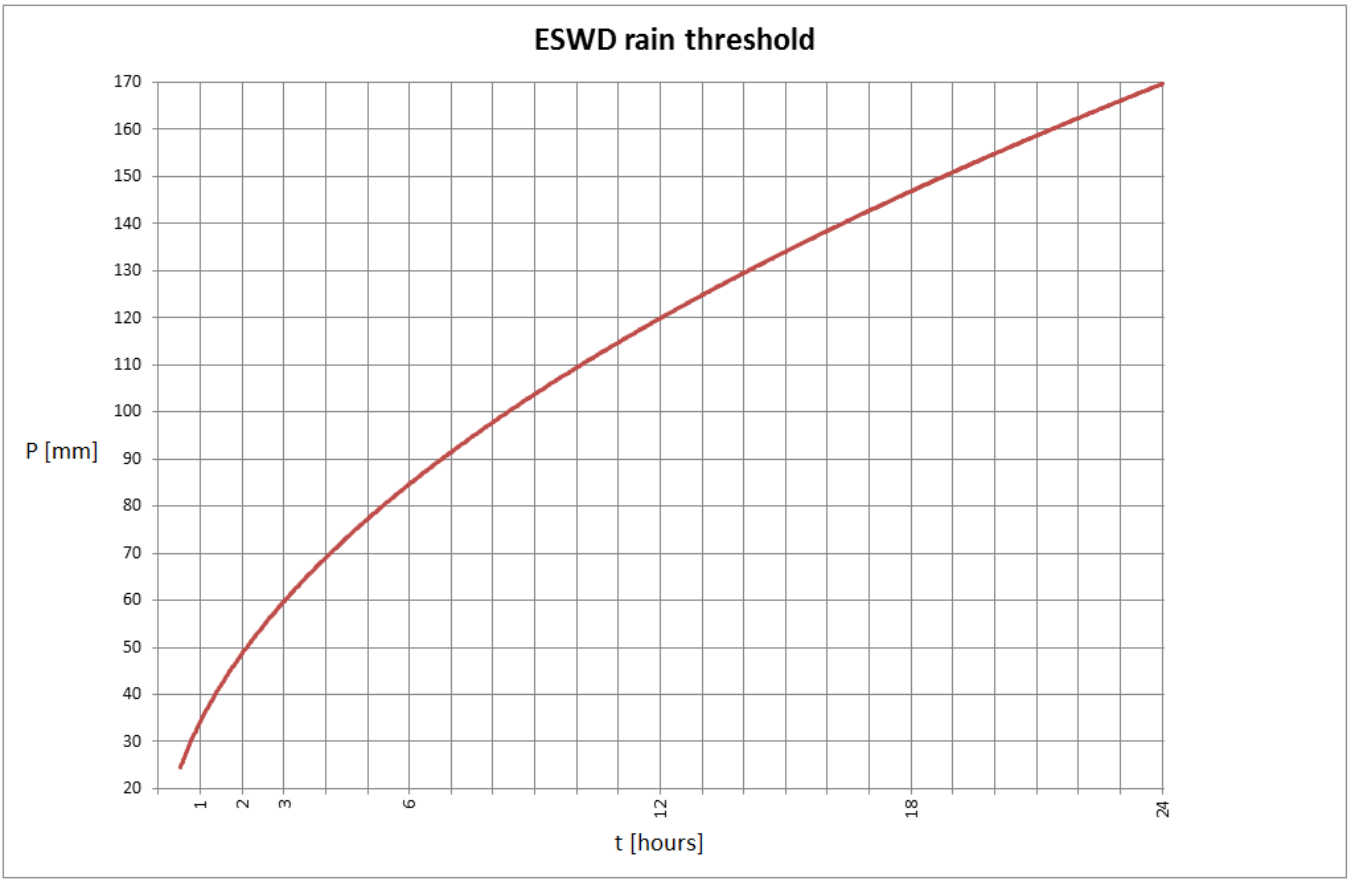
The ESWD follows the criterion for extreme precipitation by Wussow (1922) and Nachtnebel (2003) that requires that a precipitation amount P [mm] fallen during a period t [minutes] meets the following criterion:

$P >= 2 \sqrt{(5\ t)}$

We require that $1/2 \text{ hour} < t < 24 \text{ hours}$.

For selected time intervals, this formula yields these values:

Duration	Amount
½ hour	25 mm
1 hour	35 mm
2 hours	49 mm
3 hours	60 mm
6 hours	85 mm
12 hours	120 mm
18 hours	147 mm
24 hours	170 mm



Note

Rain measurements of less than 25 mm must not be reported to the ESWD, even for shorter intervals than ½ hour.

8. Heavy snowfalls or snowstorms

Definition

Snowfall (or snow grains) and/or snowstorm in an amount that causes important disruptions of daily life and/or considerable material or economic damage.

Criterion for inclusion in the ESWD

The event must have caused an extreme impact. An extreme impact has occurred if:

- Important streets have become impassable, or have been closed as a precaution to avoid accidents caused by collapsing trees or avalanches
- Rail, tram or subway transport is disrupted
- An airport had to be closed for multiple hours
- Widespread damage was done to trees
- Power outages that are caused by multiple failures of power lines
- Structures are damaged, e.g. because of collapsing roofs (only in as far as it was caused mostly by a single snowfall event rather than snow accumulating over a long period)

Note

The following are not impact-related criteria, and therefore must no longer be reported to the ESWD:

- observations of large snow accumulations
- traffic accidents (vehicles or pedestrians as well) due to slipperiness

9. Ice Accumulations

Definition

Accumulations of ice on the earth's surface and/or objects (such as power lines) in an amount that causes important disruptions of daily life and/or considerable material damage or economic damage, not including ice accumulations resulting primarily from snowfall. Ice accumulations may result from freezing rain, freezing drizzle, freezing fog or from direct deposition of water vapour, resulting in glaze, frost or rime.

Criterion for inclusion in the ESWD

The event must have caused an extreme impact. An extreme impact has occurred if:

- Important streets have become impassable, or have been closed as a precaution to avoid accidents caused by collapsing trees
- Rail, tram or subway transport is disrupted
- An airport had to be closed for multiple hours
- Widespread damage was done to trees
- Power outages that are caused by multiple failures of power lines
- Structures are damaged, e.g. because of collapsing roofs (only in as far as it was caused mostly by a single event rather than ice accumulating over a long period)

Note

The following are not criteria for inclusion in the ESWD:

- observations of large ice accumulations
- traffic accidents (vehicles or pedestrians as well) due to slipperiness

10. Avalanches

Definition

A rapid flow of (mainly) snow down a slope, which, because of its size, could bury a person or inflict serious damage.

Criterion for inclusion in the ESWD

- In order for the avalanche to be considered 'capable of doing damage' it should be at least of avalanche size 2 ("Small Avalanche"), i.e. a path length of 50 m or more, and a volume of at least 100 m^3. See avalanches.org (European Avalanche Warning Services) for further information.

11. Damaging lightning

Definition

Any lightning phenomenon which has caused important damage to aircraft, vehicles, ships or structures, or which has injured or killed people or animals. Any "exceptional lightning phenomenon" which has caused - or is capable of causing – important damage.

In the category "exceptional lightning phenomenon" such phenomena like ball lightning or upper atmospheric lightning may be reported, even if no damage occurred or if no damage information is available. According to the limited knowledge these exceptional phenomena may cause important damage, e.g. to spacecraft in the case of upper atmospheric lightning.

References:

Wussow, G., 1922: Untere Grenze dichter Regenfälle. Met. Z. 39, 173–178.

Nachtnebel, H.-P., 2003: Studienblätter der Gewässerkunde, Hydrometrie und Hydroinformatik. Universität für Bodenkultur Wien, Institut für Wasserwirtschaft, Hydrologie und konstruktiven Wasserbau, SS 2004.

A. Notes on wind speed measurements:

1. Wind speed measurements on mountain stations are excluded. Mountain stations are stations well-removed from permanently inhabited locations such as hamlets, villages or towns.

2. The measurements must be made no higher than 10 metres above the surrounding mean surface. WMO guidelines for such measurements apply.

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