

NEW EVENT TYPES FOR THE EUROPEAN SEVERE WEATHER DATABASE (ESWD)

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I. INTRODUCTION

The European Severe Weather Database (ESWD) is a database of severe weather reports for Europe and the Mediterranean Region currently containing over 39 000 individual reports and much more single data entries. The phenomena it contains are primarily associated with severe convective weather: tornadoes, large hail, heavy precipitation, and lesser whirlwinds (gustnadoes and dust devils).

Since its start, inclusion of new types of phenomena has been a topic of discussion between the European Severe Storms Laboratory (ESSL), its partners (such as the National HydroMeteorological Services and spotter organizations) and other ESWD users. This poster presents the outcome of the discussion process.

II. PRESENTATION OF NEW EVENT TYPES

During the first years of ESWDs existence, a general lack of data on severe convective weather occurrence across Europe meant more priority was given to increase the coverage than to introduce new event types.

But recently, within the European Union FP7 Project EWENT (Extreme Weather impacts on European Networks of Transport), an inclusion of new event types has been implemented. These new event types for ESWD reports extend the usability of the ESWD to non-convective severe weather events.

In late summer 2011, the new event type “snow” was introduced, covering heavy snow or snowstorm events. This allows e.g. the recording of snow accumulations or unusual blowing snow conditions, both in convective and non-convective conditions.

At the same time, two additional winter time events were introduced to the ESWD: **Icing** events (glaze or black ice resulting from frozen precipitation, or rime or frost) and **avalanches** (introduced in coordination with the European avalanche warning services).

Last, one additional event type for convective severe weather was introduced: **lightning**. This type does not include all strokes, but merely those having caused significant damage or injuries to, for example, aircraft, vehicles, ships, people, or animals.

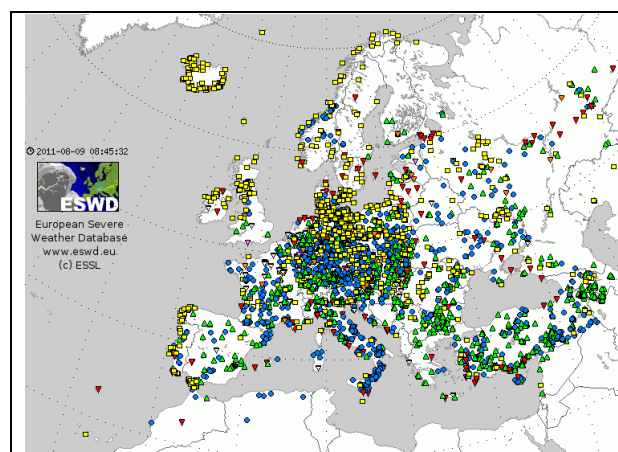


FIG. 1: ESWD reports from 1st of January to 9th of August 2011 (4449 reports in this period).

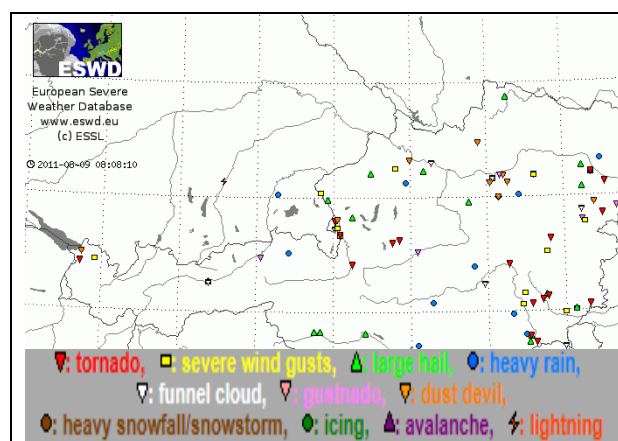


FIG. 2: ESWD display of test reports, showing the now available event type symbols in a central European region.

FIG. 3: Currently the ESWD webpages can be viewed in 15 different languages (see footer on this page with French, Spanish and Polish example).

Requirements for report entries and event definitions can be found on the ESWD webpage www.eswd.eu.

tornado (old) 2 revisions (link)	Karlsruhe, Baden-Württemberg Germany (49.01 N, 8.38 E) 2011-08-01 (Monday) 01:05 UTC	based on: information from a report in scientific literature, a report in wind speed: 40 m/s accompanying weather: hail >= 2.0 cm in diameter report status: plausibility check passed (QC+) contact: test (e-mail)
lightning (old) 4 revisions (link)	Karlsruhe, Baden-Württemberg Germany (49.01 N, 8.39 E) 2011-06-20 (Monday) 02:04 UTC	based on: information from photo or video of the event, a report in sc anomalous phenomena, other exceptional lightning phenomena report status: plausibility check passed (QC+) contact: test (e-mail)
heavy snowfall/snowstorm (old) 1 revision (link)	Madrid de las Cadenchas Castilla y León Spain (42.77 N, 5.53 W) 2011-06-08 (Wednesday) 09:03 UTC	based on: information from a report in scientific literature, a television report status: plausibility check passed (QC+) contact: ESSL management (e-mail)
icing (old) 2 revisions (link)	Copenhagen Region Hovedstaden Denmark (55.67 N, 12.58 E) 2011-06-08 (Wednesday) 02:03 UTC (+/- 1 hr.)	based on: information from a report by a weather service, a report in report status: event fully verified (QC) contact: test (e-mail)
avalanche (old) 1 revision (link)	Selkirk Vestfirði Iceland (66.03 N, 23.00 W) 2011-06-06 (Monday) 12:08 UTC (+/- 15 min.)	based on: information from a newspaper report, a report on a website type of avalanche: slab avalanche evidence detection: dense forest avalanche avalanche triggering: spontaneous ESSL report status: plausibility check passed (QC+) contact: This Kühne (ESSL management) (e-mail)
lightning (old) 1 revision (link)	Karlsruhe (KA) Baden-Württemberg Germany (49.01 N, 8.39 E) 2011-06-06 (Monday) 03:09 UTC (+/- 1 hr.)	based on: information from a report by a weather service, a television lightning strike causing damage or injuries to ship, road traffic report status: plausibility check passed (QC+) contact: ESSL management (e-mail)
heavy rain (old) 6 revisions (link)	Aachen (Aachen) Bayern Germany (49.03 N, 12.28 E) 2011-06-04 (Saturday) 02:05 UTC (+/- 15 min.)	based on: information from an eye-witness report, a report in scientific literature, a report in a newspaper this is a test report http://www.meteopics.eu/spottingnew?cid=947146a36363 http://www.meteopics.eu/spottingnew?cid=947146a36363 report status: plausibility check passed (QC+) contact: test (e-mail)
gustnado (old) 1 revision (link)	L'Honnand Région Aquitaine France (44.83 N, 1.30 E) 2011-05-16 (Monday) 08:17 UTC (+/- 3 hrs.)	based on: information from a report on a website, a report in some report status: as received (QC) contact: test@essl.org (e-mail)
avalanche (old) 1 revision (link)	Innsbruck Tirol Austria (47.27 N, 11.40 E) 2011-05-11 (Wednesday) 12:29 UTC (+/- 1 hr.)	based on: information from a report by a weather service number of people injured: 15 number of people dead: 5 report status: as received (QC) contact: Alois M. Holzer (e-mail)
tornado (old) 6 revisions (link)	Baden-Baden Baden-Württemberg Germany (49.75 N, 8.25 E) 2011-05-10 (Tuesday) 16:08 UTC (+/- 15 min.)	based on: information from a report in scientific literature, a trained accompanying weather: hail >= 2.0 cm in diameter, hail < 0.5 cm dia report status: plausibility check passed (QC+) contact: ESSL management (e-mail)
large hail (old) 1 revision (link)	Ried im Innkreis Oberösterreich Austria (48.22 N, 13.59 E) 2011-05-10 (Tuesday) 17:43 UTC	based on: information from an eye-witness report event duration at place of observation: 10 min. maximum hail diameter: 4 cm maximum hail weight: 36 g thickness of hail cover: 5 cm report status: plausibility check passed (QC+) contact: Andreas Beedisch, SkywarnAT (e-mail)

FIG. 4: Detail of ESWD webpage display - some old and new event types (test entries), marked in different colours, including weblinks to the partner webpage of www.meteopics.eu for related event or damage photos.

III. FURTHER NEW APPLICATIONS AND CONCLUSIONS

The inclusion of the new event types will, together with the existing ones, allow climatologists to use the ESWD as a one-stop platform and as a provider for most types of extreme weather reports. This usability was demanded by some National Weather Services and is now available.

Further languages have been added. The ESWD can now be used in 15 different languages. Persons or institutions interested in cooperation are vividly invited to help with the translation into even more languages.

A new partnership with the METEOPICS platform will allow ESWD data suppliers to upload related photographs of the event or damages resulting from an event to this professional storage site. ESWD users therefore can expect even more compelling information stored with each report. In return users of METEOPICS will be invited to report their observations to the ESWD. Poster 137 of this ECSS ("Trusted Spotter Network of Austria" by Krennert et al.) also refers to this topic.

In order to allow for the transmittance and storage of personal source identification, in the course of this update, a new field "Spotter ID" has been introduced into the ESWD. It allows to uniquely identify spotters by a 10 digit identification code, following the model "CCxxxxxNNN". CC is the two digit country code, xxxxxx a five digit number to be assigned by the spotter organization and NNN is an abbreviation of the name of the spotter organization. E.g. AT12345SKY would be spotter no. 12345 from

Skywarn Austria. This strategy allows the transmission of IDs without storing personal data. One application for this is the distinction between different quality levels on the side of a National Weather Service, when dealing with near real time data originating from spotter organizations, relevant for sensitive warning decisions.

The new ESWD event types open the European Severe Weather Database for a wider use in climatology and near real-time applications – which has been demanded by user groups.

Together with some other enhancements, the ESWD is herewith ready for many more applications in science, at weather services and at commercial users. Interested parties are invited to contact the ESWD staff via eswd@essl.org and to retrieve free data samples via www.eswd.eu.

IV. ACKNOWLEDGMENTS

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We thank Michael Staudinger from ZAMG for the surely fruitful METEOPICS cooperation.

This ESWD extension was co-initiated by ESSL's first Director Nikolai Dotzek, who unexpectedly passed away on 29th May 2010. His achievements will live on, not only in this work.

V. REFERENCES

- Dotzek N., Groenemeijer P., Feuerstein B., Holzer A. M., 2009: Overview of ESSL's severe convective storms research using the European Severe Weather Database ESWD. *Atmos. Res.*, 93 575-586.
- Groenemeijer P., Zhongjian L., Feuerstein B., Haeseler S., Holzer A. M., Kühne T., 2011: ESSL Technical Report 2011-01, ESWD data format specification Version 1.50 and 1.50-csv. <http://www.essl.org>.