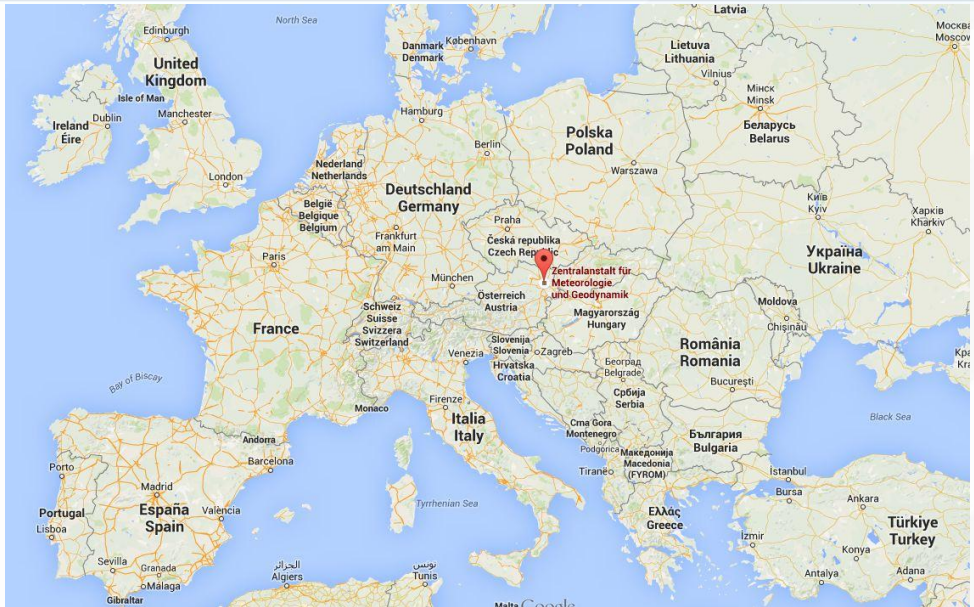
The Trusted Spotter Network Austria and its Fingerprint on ESWD

Thomas Krennert, ZAMG Vienna, Austria, Weather Forecasting



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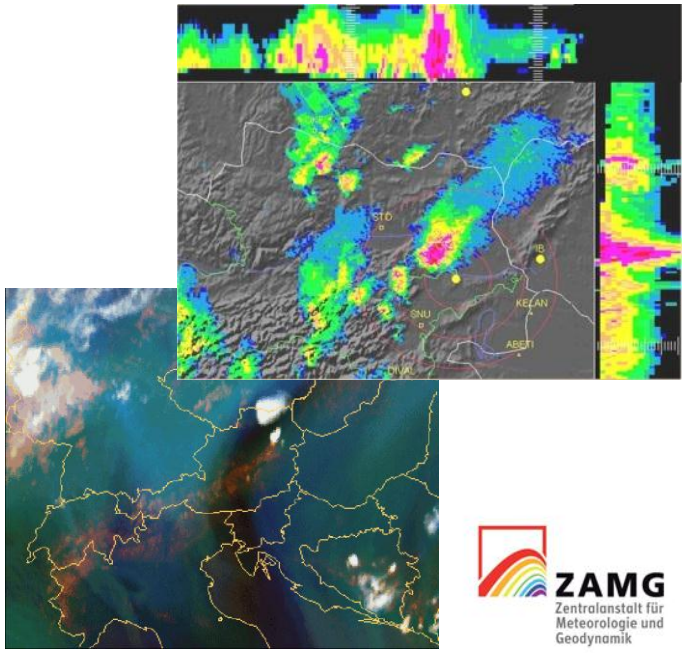
MOTIVATION FOR NWS - SPOTTER COLLABORATIONS

- Steadily decreasing number of available ground observations for significant weather
- Multitude of automated remote measurement systems
- Especially with small scale extreme weather: still significant blind spots regarding surface impact

- Increasing demand for ground truth observations
- Real time application for public warnings and forecasts
- **Reliable interface of real-time reports for forecasters?**



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INCEPTION AND HISTORY OF STORM SPOTTING

- First developments of storm spotting and severe weather awareness in the US during 1920s (see Doswell, et al 1999)
- Organized spotter networks during WWII near military installations (i.e. vulnerability to lightning)
- First public Tornado forecasts by USAF meteorologists 1948

- Civilian based volunteer spotter groups maintained by Weather Bureau / National Weather Service NWS during 1960
- Official spotter organization SKYWARN since 1970s

- Hazards reported: convective, winter, flooding, wind, naval, geological, aeronautical

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STATUS QUO IN THE USA

- ~300.000 trained spotter covering nearly the whole country
- Warning coordination meteorologists at 122 local NWS offices administrate and train (nearly every US county)
- Further training with online material, licensing varying

- Availability of various meteorological data (Doppler radar, satellite, SPC products)
- Reports are given by phone, fax, amateur radio, social media, smart phone apps and other…
- Downside: “Storm chaser industry”

http://www.nws.noaa.gov/skywarn/

http://www.meted.ucar.edu/spotter_training/spotter_role/index.htm

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COLLABORATIONS: STATUS QUO IN EUROPE - OVERVIEW

Nearly every European NWS
collaborates with spotter or chaser organizations

- **Different characteristics of cooperation regarding:**
  - **official agreements**
  - **availability of reports to the forecaster (time lag, visualisation systems)**
  - **scientific supervision and coaching, licensing**
  - **data exchange (i.e. high resolution data for spotters)**
  - **spotter status (general public – non advanced - advanced)**

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TRUSTED SPOTTER NETWORK AUSTRIA

TRUSTED SPOTTER:
- SKYWARN AUSTRIA
- AMATEUR RADIO SPOTTER

- Severe / dangerous / significant weather reports
- According to ESSL / ESWD guidelines
- Damage reports, Images

ESWD
European Severe Weather Database

- DATA BASE
- TSN reports with QC1 in ESWD
- Provides guidelines / thresholds for reports
- Provides data format
- Provides TSN "real time" Nowcast Mode (e.g. Austria)

SPOC Interface: data & reports

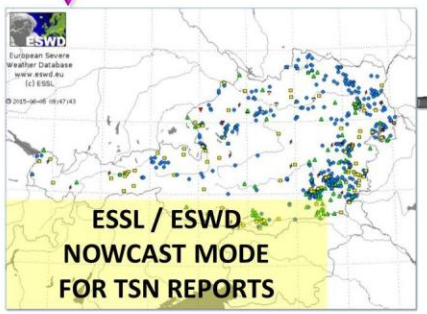
Publication platform for images:
- Severe weather
- Damage reports
- Clouds
- Earth – atmosphere

- www.tsn.meteopics.eu

meteopics report your weather

- Provides different weather data via internet platform

TSN Licensing :
- regular workshops
- personal training at forecast centre
- scientific advice



ESSL / ESWD NOWCAST MODE FOR TSN REPORTS

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- OPERATIONAL FORECAST and WARNINGS
- Real time evaluation of published warnings
- Adaption of warnings
- Scientific case studies
- Joint publications, press releases

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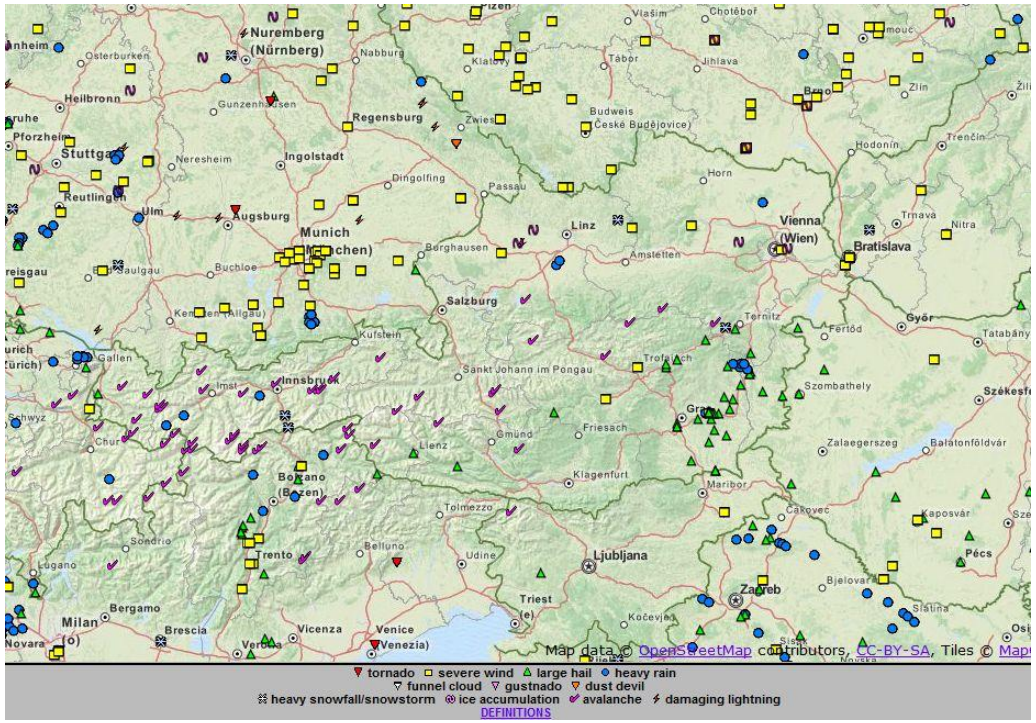
ESWD CRITERIA AND QUALITY CONTROL REPORT STATUS



ESWD report criteria:

- Lesser whirlwinds, Gustnadoes
- Tornadoes
- Severe wind gusts
- Large hail
- Heavy rain or heavy snowfall
- Ice accumulations
- Lightning damage
- Avalanches

QC report status

- QC0: as received (general public; via ESWD, SKYWARN and ZAMG HP)
- QC0+: plausibility check passed (members of spotter organizations)
- QC1: report confirmed (TSN, QC office@ESWD)
- QC2: event fully verified (NWS, QC office@ESWD)

http://www.essl.org/cms/wp-content/uploads/20140509-ESWD_criteria.pdf

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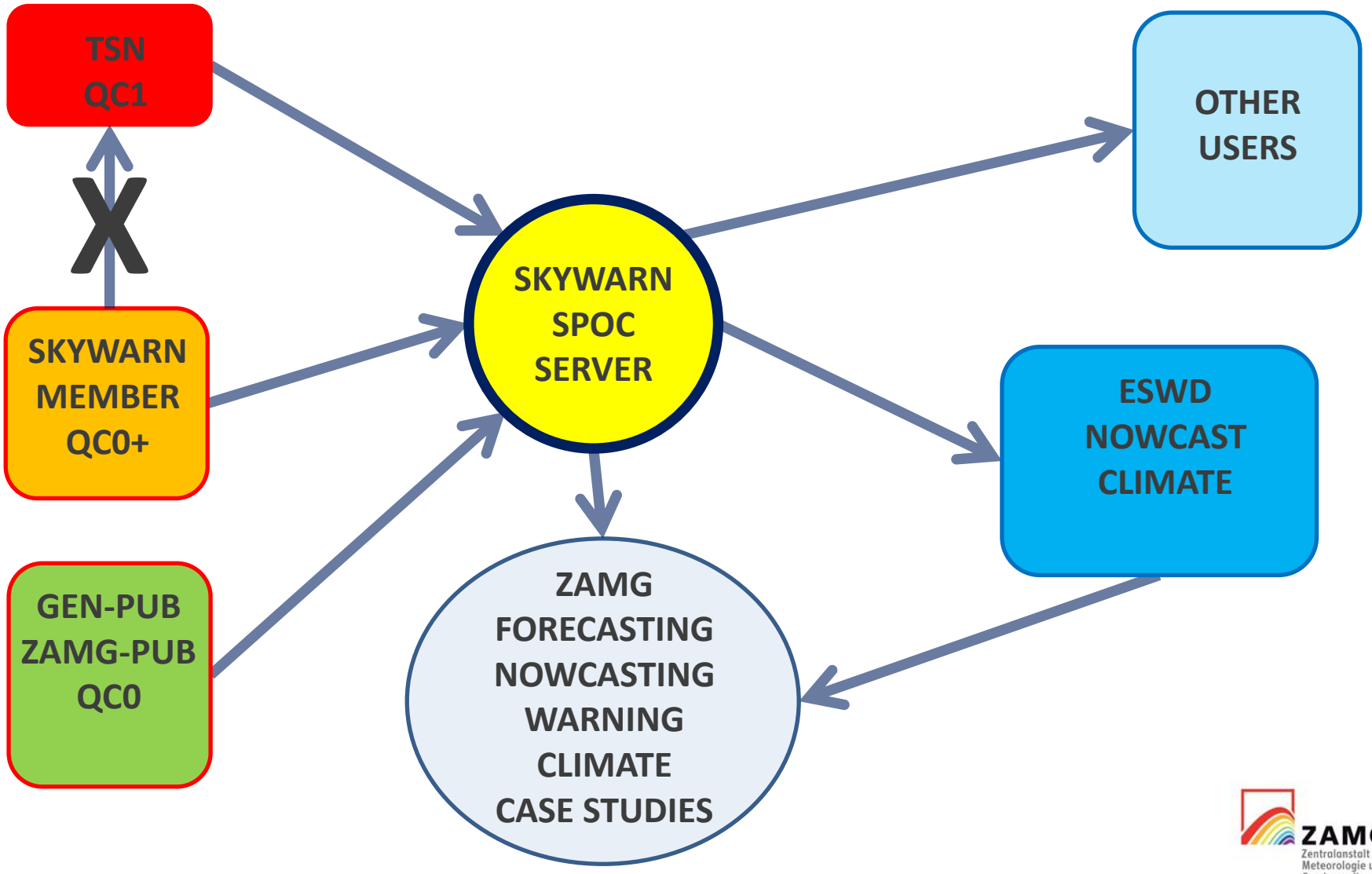
DATA FLOW



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TSN AUSTRIA: STAUS QUO

- Currently ~70 Trusted Spotters (licensed, or in process)
- Majority of spotters within the eastern half of Austria (main thunderstorm region)
- Individual volunteer commitments cause fluctuations in headcount
- Steadily growing number of spotters since 2006

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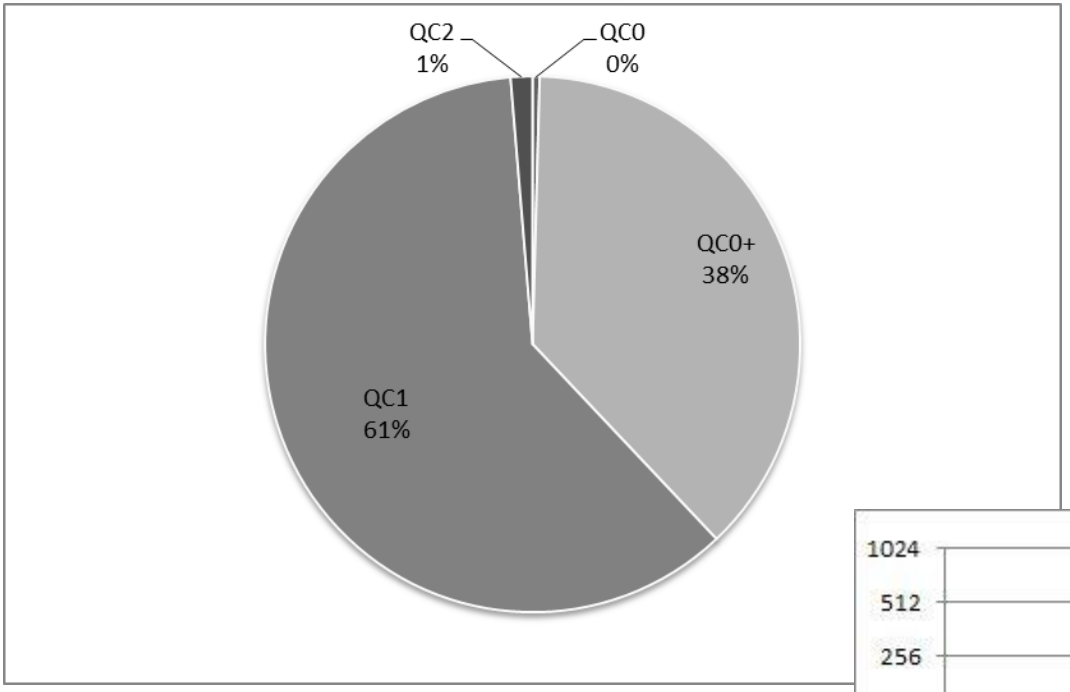
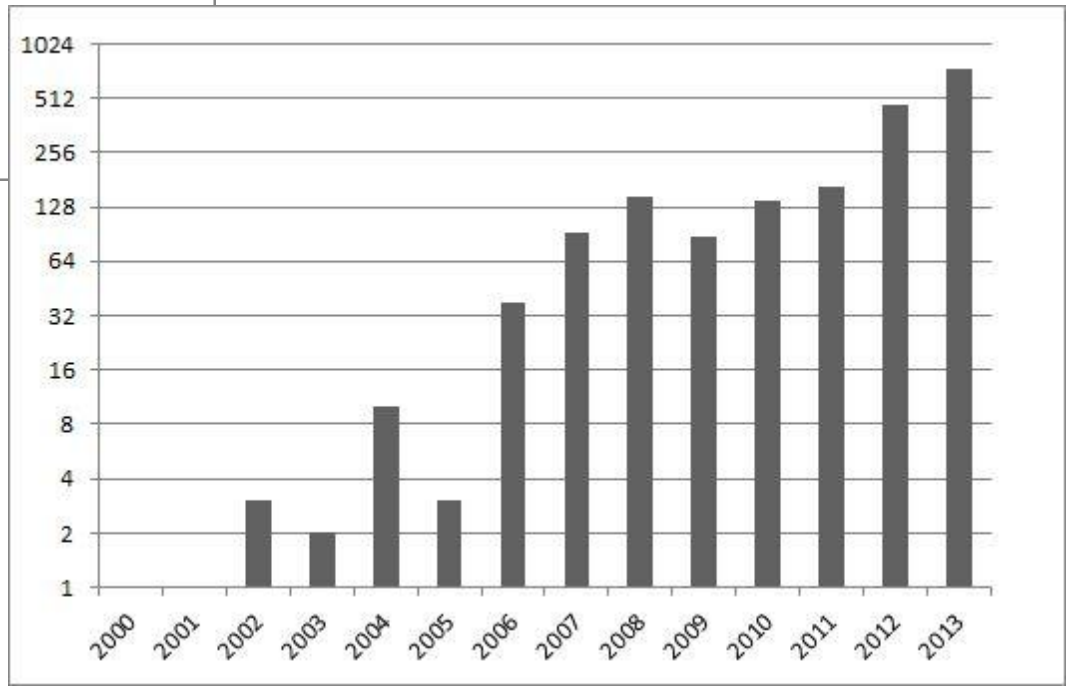
ESWD ASSESSMENT: HAIL/GUST/LIGHTNING REPORTS



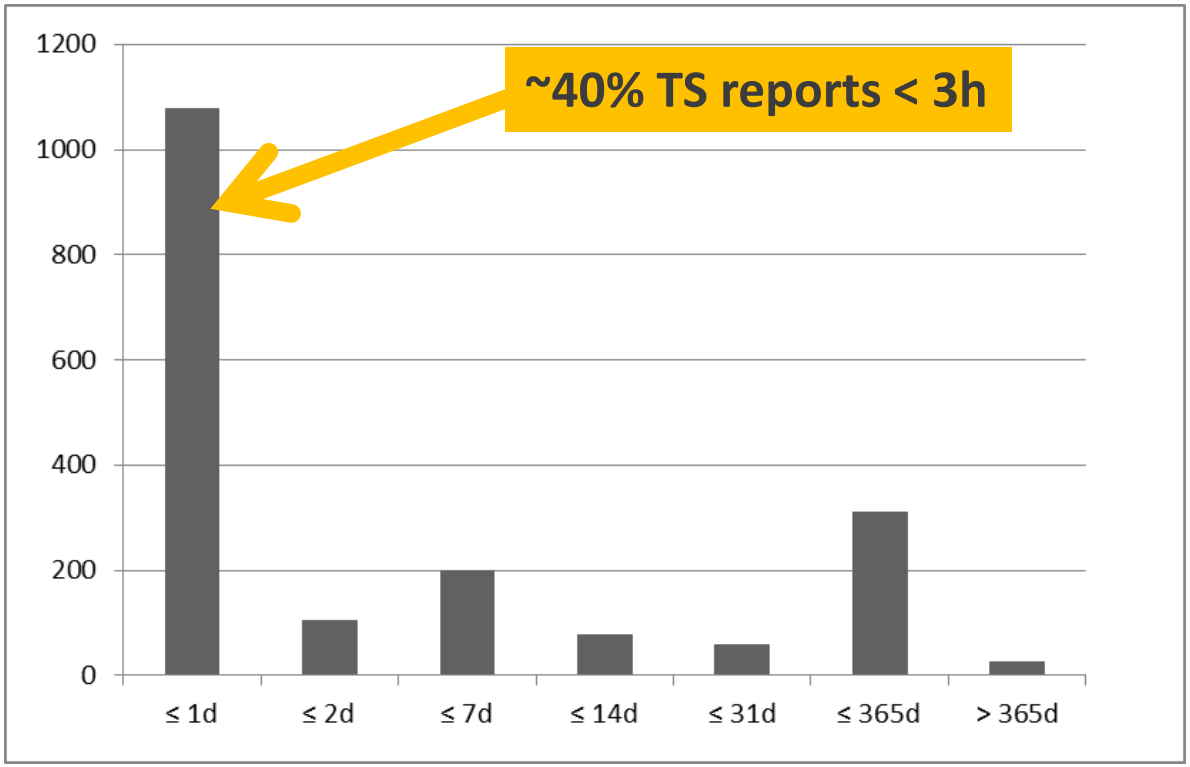
- Total of most common TS reports in Austria: hail/gust/lightning
- According to ESWD criteria
- 2000 – 2013



Total of most common TS reports in Austria:

- Report status (above)
- Absolute logarithmic frequency (right)

ESWD ASSESSMENT: HAIL/GUST/LIGHTNING REPORTS



- Total of most common TS reports in Austria: hail/gust/lightning
- According to ESWD criteria
- 2000 – 2013

- Time lag between event and report date
- < 1 day due to spotter activities
- > 2 days: further damage assessment and/or ESWD QC office

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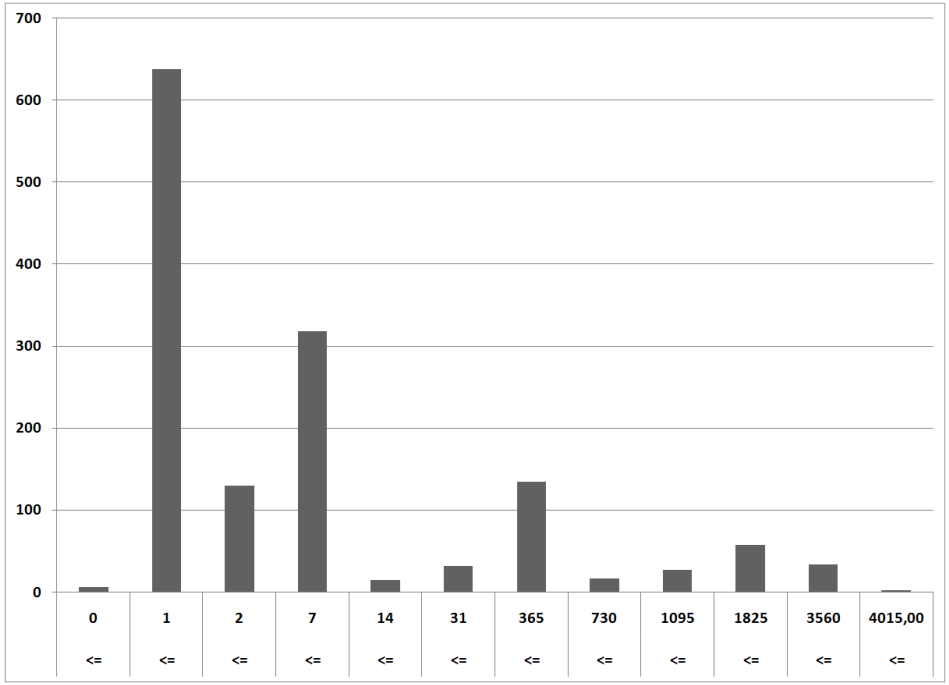
ESWD ASSESSMENT: HEAVY RAIN, >40mm/6hrs, 2000-2011

Relative frequency of ESWD reports correlated to climate stations (heavy rain event type)

- Trend: nearly all events detected by Austrian climate stations will be reported to the ESWD (thick black line)

Time lag between event and report time (right)

- Small number of reports < 1 day
- Large number of reports between 1 and 7 days (damage assessment and/or ESWD QC office)



THANK YOU FOR YOUR ATTENTION!

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References:

DOSWELL III, C. A., Moller, A. R., Brooks, H. E., 1999: Storm Spotting and Public Awareness since the First Tornado Forecasts of 1948, Wea. Forecasting, **14**, 544pp

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Further questions are sincerely invited…

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