Hail hazards in Switzerland

with return periods of up to 300 years

2nd European Hail Workshop Bern
20.04.2017

René Cattin
Dr. Willi Schmid
Dr. Hans-Heinrich Schiesser
To be honest....
Consortium H2016

René Cattin
Meteotest

Dr. Willi Schmid
meteoradar GmbH

Dr. Hans-Heinrich Schiesser
ETH hail group 1976-1999
Damages caused by hail

Everybody is concerned about hail hazards

Source: statistics of 18 cantonal building insurances
Hail hazard maps in CH

Norm SIA 261/1 copyright 2003 by SIA Zurich

Hagelkarte Schweizer Hagel, 2011

Hagelkarte VKF, Schiesser 2006

Mobiliar Lab für Naturrisiken, UniBern, Luca Nisi, 2015
Hail hazard in Aarberg
Hail hazard in Aarberg

High risk

> 3 cm every 50 years

Average risk

Average frequency

Norm SIA 261/1 copyright 2003 by SIA Zurich

Hagelkarte Schweizer Hagel, 2011

Hagelkarte VKF, Schiesser 2006

Mobiliar Lab für Naturrisiken, UniBern, Luca Nisi, 2015
A new map is needed

Initiative of VKF (Association of Canton Fire Insurances)

Requirements

• State of the art technology
• Supported and accepted by all stakeholders
• Including all available data sources
• High spatial resolution
• Return periods of up to 300 years
• Different hail stone diameters
• Continuity guaranteed, periodic updates
National hail hazard map

→ Urs Germann, Friday, 9h

→ Project start expected in 2017
Data sources in CH

Available hail data sources in Switzerland

Radar MeteoSwiss dual polarisation
Observations/Sensors MeteoSwiss
Radar MeteoSwiss

→ Urs Germann, Friday, 9h

Period too short for return periods > 50 years
Data sources in CH

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- Radar Schiesser digital (ETH, MeteoSwiss)
- Radar Schiesser analogue (ETH, MeteoSwiss)

Time:

- 1840
- 1860
- 1880
- 1900
- 1920
- 1940
- 1960
- 1980
- 2000
- 2020
Early MCH radars & ETH radar
Data sources in CH

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Year:
- 1840
- 1860
- 1880
- 1900
- 1920
- 1940
- 1960
- 1980
- 2000
- 2020
Grossversuch ETH IV
1977 - 1982
«hail suppression experiment»

Wetterradar 10 cm Emmen

→ hailstone size distributions

333 hail pads

Footprints of hail storms
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- Radar "Grossversuch ETH IV"

Timeline:
- 1840
- 1860
- 1880
- 1900
- 1920
- 1940
- 1960
- 1980
- 2000
- 2020

20.04.2017
Damage reports Schweizer Hagel

- NFP31 „Klimaänderung und Naturkatastrophen“ (1992 to 1996)
- Systematic list of hail damage reports from 1920 to 1996
- Continued since 1997 on private basis

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Damage reports Schweizer Hagel

No. of days with damage reports from more than 100 local communities (1920-2015)
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20.04.2017
Natural hazards Bd. I and II

1938, Hermann Lanz, Curt Rommel

→ Information needs to be digitized
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- Natural Hazards Bd. I and II

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Lots of bits and pieces
Once the puzzle is solved...

..we get

• a unique long term hail data set for Switzerland
• a suitable data basis for extreme value statistics
• a good data basis for evaluation of statistical models
• a catalogue of hail events back to 1850
Munich hail storm 12.7.1984

Thank you!
Fragen & Feedback?

www.meteotest.ch