Geo-historical approach of the avalanche risk in a medium-high mountain.

The case of the Vosges (Alsace, France)
Plan

1. Context

2. Factors of underassessment of the avalanche risk

3. Results

4. Applications

5. Conclusion
The Vosges range
January and February 2000:

- 15 victims of avalanches
- 3 died people

Snow height of around 3.80 meters on the Grand Ballon in 2006
(summit of the Vosges, 1424 m)
2. Factors which contribute to the lack of knowledge / ignorance

- The topography: rounded summits → “low hills”
- Variability of snowfall and snow height
- Summits easily accessible: roads and car parks
- Local press reflects an ambiguous image of the Vosges
Results:

- Image of “easy mountain”

- Preferential use of the term “Sluff” rather than “avalanche”

→ Negation and ignorance about the subject of avalanches
3. Chronology

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Sediments of an avalanche (stones, trees,...) in a valley (Wildenstein). February 1895. *Michel Cueny*

Cirque Ammelthal, March 2009. *Florie Giacona*
Localization of the avalanche paths in the sector of the Rainkopf-Rothenbachkopf

February 15, 1895
February 12, 1952

Legend
- Probable path of avalanche events
- Area of avalanches
- Cornices formation
- Probable path of avalanche: strait channel / passage
- Area where probable avalanches take place (incomplete information)
- Crests road
- Area where a farm was destroyed in the 19th century
- Path probable followed in winter in the past (trade between valleys)
- Area where two persons died in the middle of the 19th century

Authors: F. Giacona, J.-P. Droux, 2008
Sources: departmental archives of the upper Rhine, municipal archives, various literature, press, oral contributions
V Encontro Nacional e I Congresso Internacional de Riscos Coimbra, 29 de Maio 2009
## Type of damage to persons (temporal distribution)

<table>
<thead>
<tr>
<th>Type of damage to persons / personal injury</th>
<th>1784 - 1999</th>
<th>2000 - 2009</th>
<th>Unknown date</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victims</td>
<td>71</td>
<td>28</td>
<td>6</td>
<td>105</td>
</tr>
<tr>
<td>Without damage</td>
<td>12</td>
<td>7</td>
<td>-</td>
<td>19</td>
</tr>
<tr>
<td>Injured</td>
<td>17</td>
<td>8</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>Died</td>
<td>27</td>
<td>5</td>
<td>-</td>
<td>32</td>
</tr>
<tr>
<td>No information</td>
<td>15</td>
<td>8</td>
<td>6</td>
<td>29</td>
</tr>
</tbody>
</table>

**Victims since 2000**
- **28%**

**Victims during 1784-1999**
- **72%**

**Died people during 1784-1999**
- **84%**

**Died people since 2000**
- **16%**

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4. Applications

Reflections about:

- A specific cartography for medium-high mountain and its practices
- A specific typology of avalanche for medium-high mountain
- A specific scale for avalanche intensity for medium-high mountain

➤ the sluffs kill (presence of trees in the avalanche paths because of the increase of the reafforestation)
The risk of avalanche in the prospect of the global warming:

- Decrease of the avalanche events because of the snowfall decrease
  or

- Increase of the extreme meteorological events → increase of the avalanche risk?
Factors of risk decrease:

- Decrease of the snowfall and snow height
- Increase of the afforestation
  ➔ Decrease of large avalanches
Factors of risk aggravation:

- Increase of the recreationists
- Variability of the avalanche occurrences because of the variability of snowfall
- Easy accessibility of the summits
- Decrease of the knowledge of the Vosges range, lack of memories and representation of “low hills”
- Increase of the afforestation
current increasing of the avalanche risk
Thanks for your attention