

# WEATHER WORKSHOP 1: SESSION 1: ROAD AND URBAN PT

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# state of knowledge

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## Infrastructure assets and operations

1. Instant damages by inundations, floods and mass movements (avalanches, landslides) in coastal zones, near rivers and in mountain areas.
2. Medium term damages: consequences of long extreme heat and cold periods mainly in medium climate zones (middle Europe)
3. Operations: mass movements, extreme winter conditions in unprepared regions

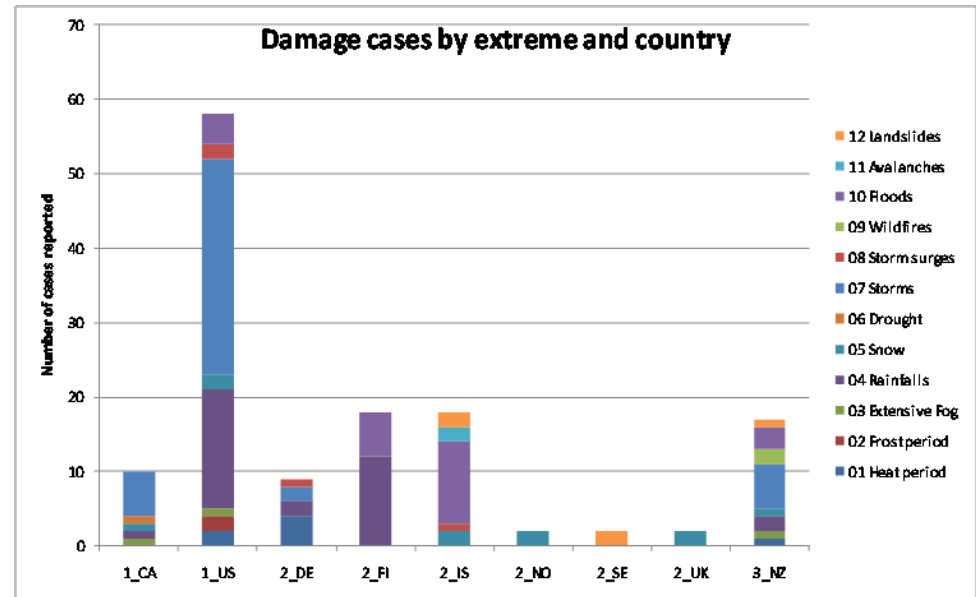
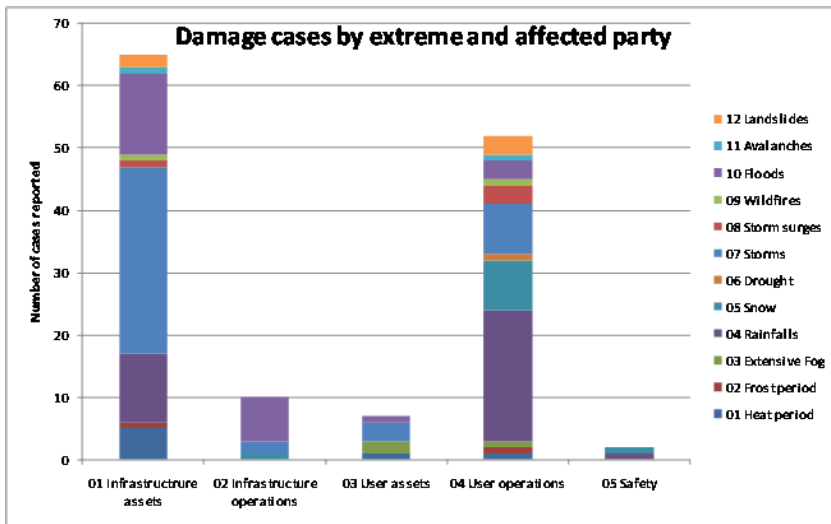
## Services, users and safety

→ Presumably more costly than infrastructure impacts

1. Traffic flow disturbance: road closures, speed reductions, delays and detouring due to falling trees, strong wind or precipitation, flooding, etc.
2. Damages to vehicles due to mass movements, landslides and accidents
3. Accidents: more but less severe incidents under extreme storm, rain and winter conditions. Impacts of extreme heat on driver performance Net cost effect not clear

# Results from international literature

Vast majority of events reported for the US. In Europe most documentations for Scandinavian area.



Most documented cases for Infrastructure assets and user operations. Economic assessment may deliver different weights.

# Data sources

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1. Literature survey: Most studies for North America and Pacific region; commonly descriptive and less quantitative.
2. Media review: valuable input on current extreme weather events. Problems: resource consuming, availability of past events, completeness and double recording.
3. Transport sector records: complex governance structure of national road networks; no complete database available, in particular for non-motorway networks.
4. Accident data: detailed records by IRTAD database, but not attributed with weather information.
5. Disaster databases (EM-DAT, Reinsurance records): valuable to design a “calendar of events”, but damages not broken down by affected sector.
6. Insurance records: Possibly available for vehicles (hail and flood damages). Road assets commonly not insured.

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# Open questions

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1. Details of road asset damages, repair costs and –periods ?
2. Impacts of under-dimensioned drainage systems ?
3. Options for assessing additional infrastructure operation costs ?
4. Options for measuring and assessing comfort-related impacts ?