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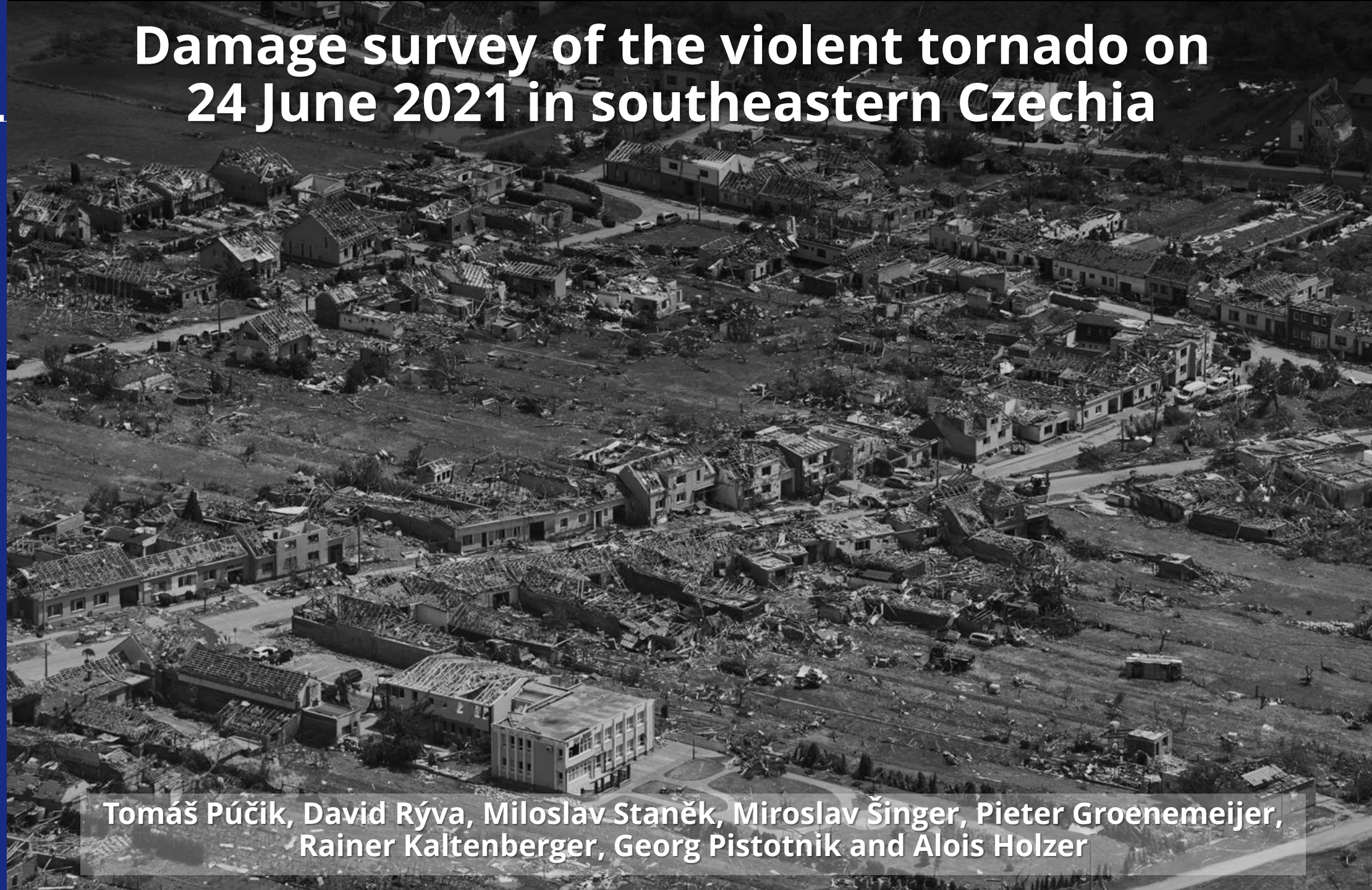
Damage survey of the violent tornado on 24 June 2021 in southeastern Czechia



Tomáš Púčik, David Rýva, Miloslav Staněk, Miroslav Šinger, Pieter Groenemeijer, Rainer Kaltenberger, Georg Pistotnik and Alois Holzer

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Damage Survey of the Violent Tornado in Southeast Czechia on 24 June 2021

Tomáš Púčik
David Rýva
Miroslav Šinger
Miloslav Staněk
Pieter Groenemeijer

FACULTY OF MATHEMATICS, PHYSICS AND INFORMATICS
Comenius University Bratislava

CHARLES UNIVERSITY
Faculty of Science

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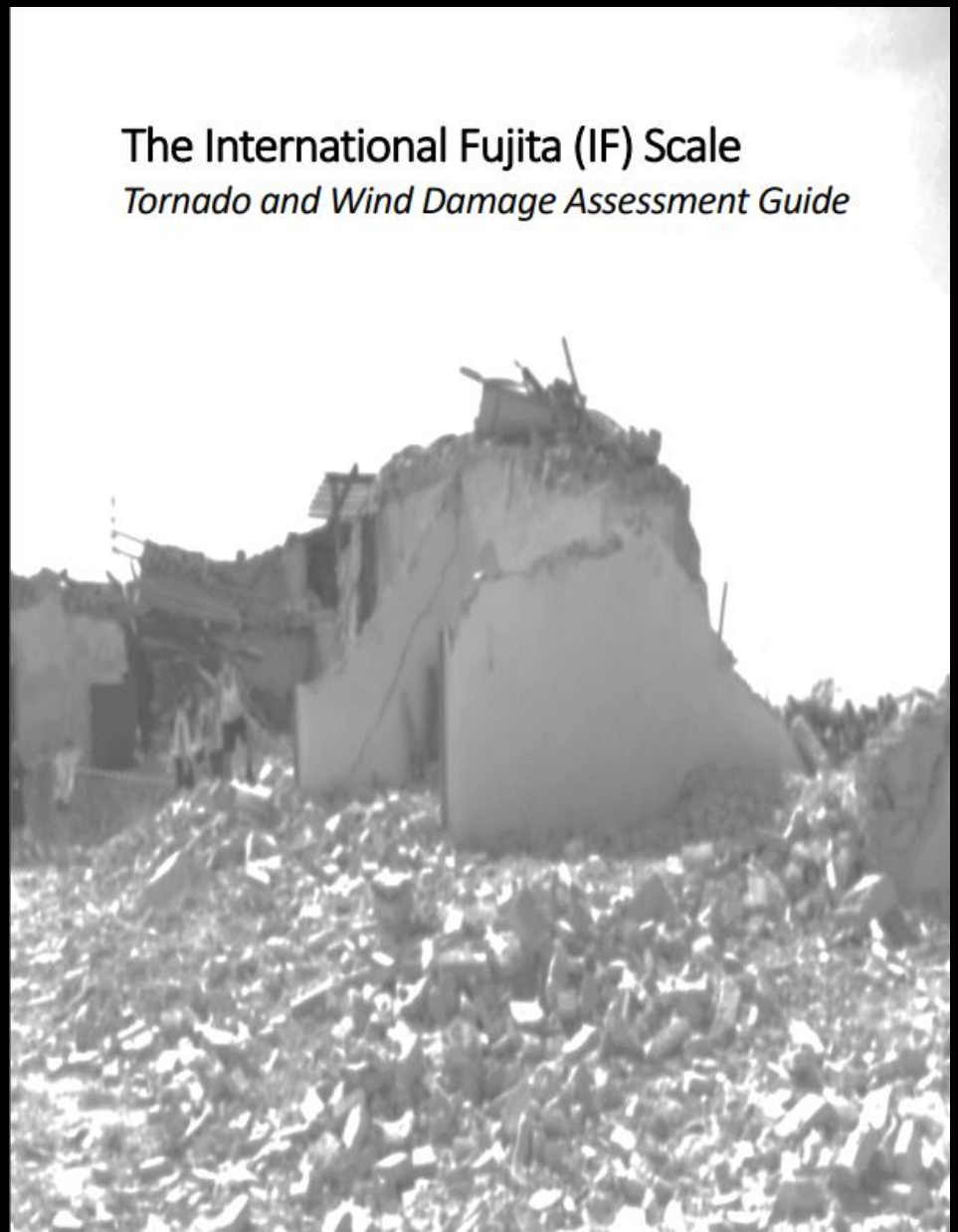
Tornado rated using 0.1 version of the IF-scale



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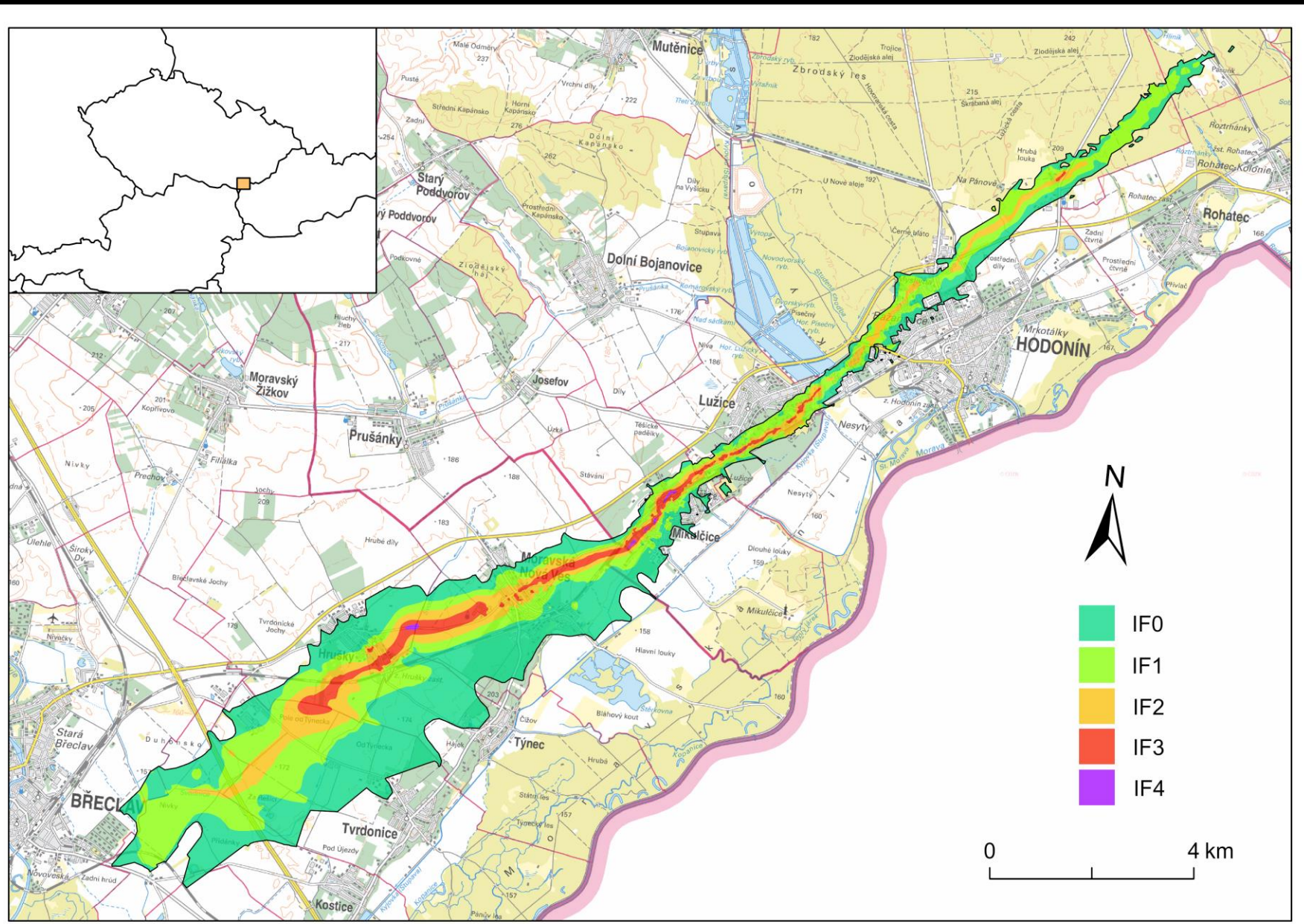
Working on this case...

... a never-ending story

Tornado damage map (version 3.2, final one?)



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Tornado damage map (version 3.2, final one?)

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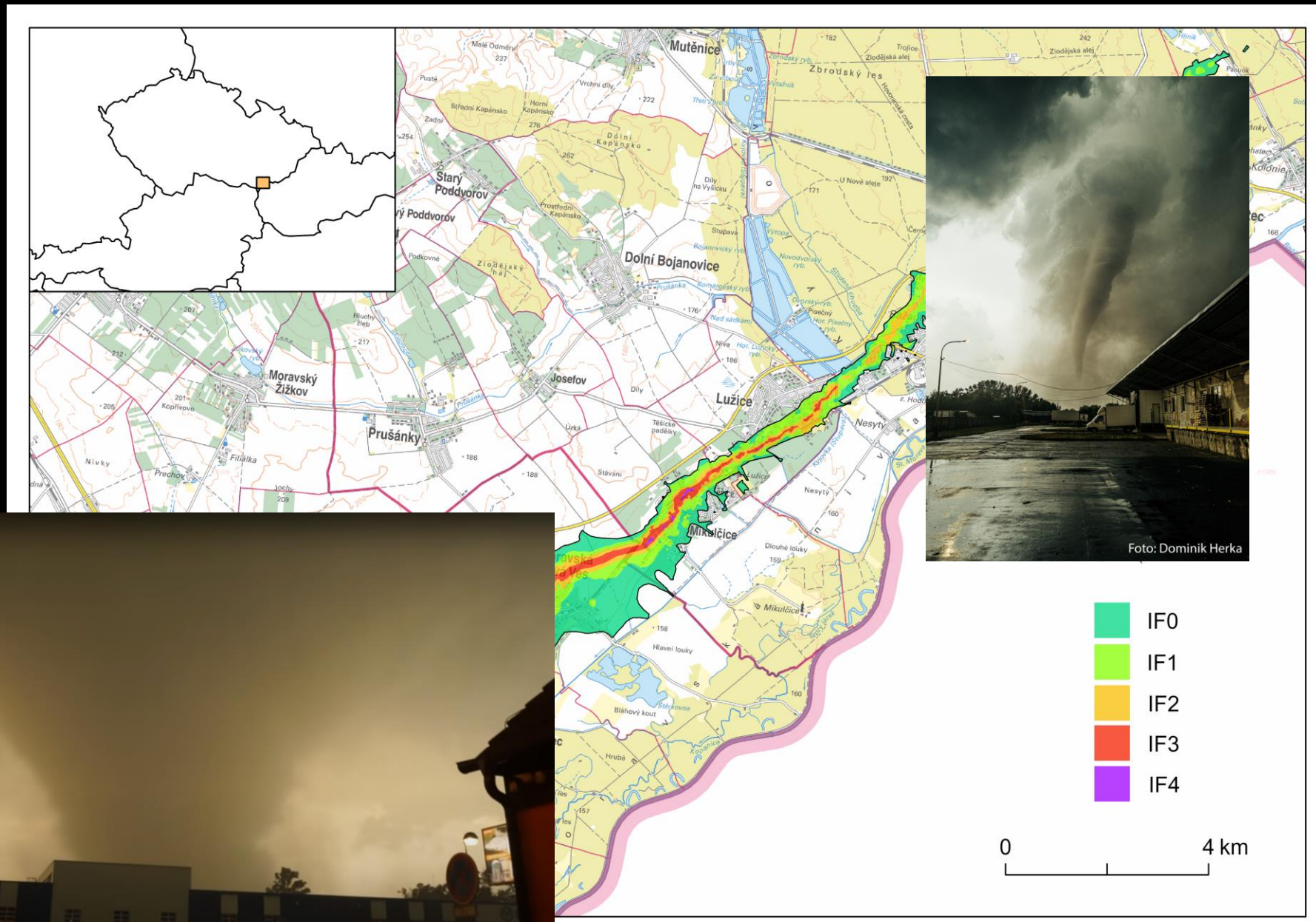

Notable damage

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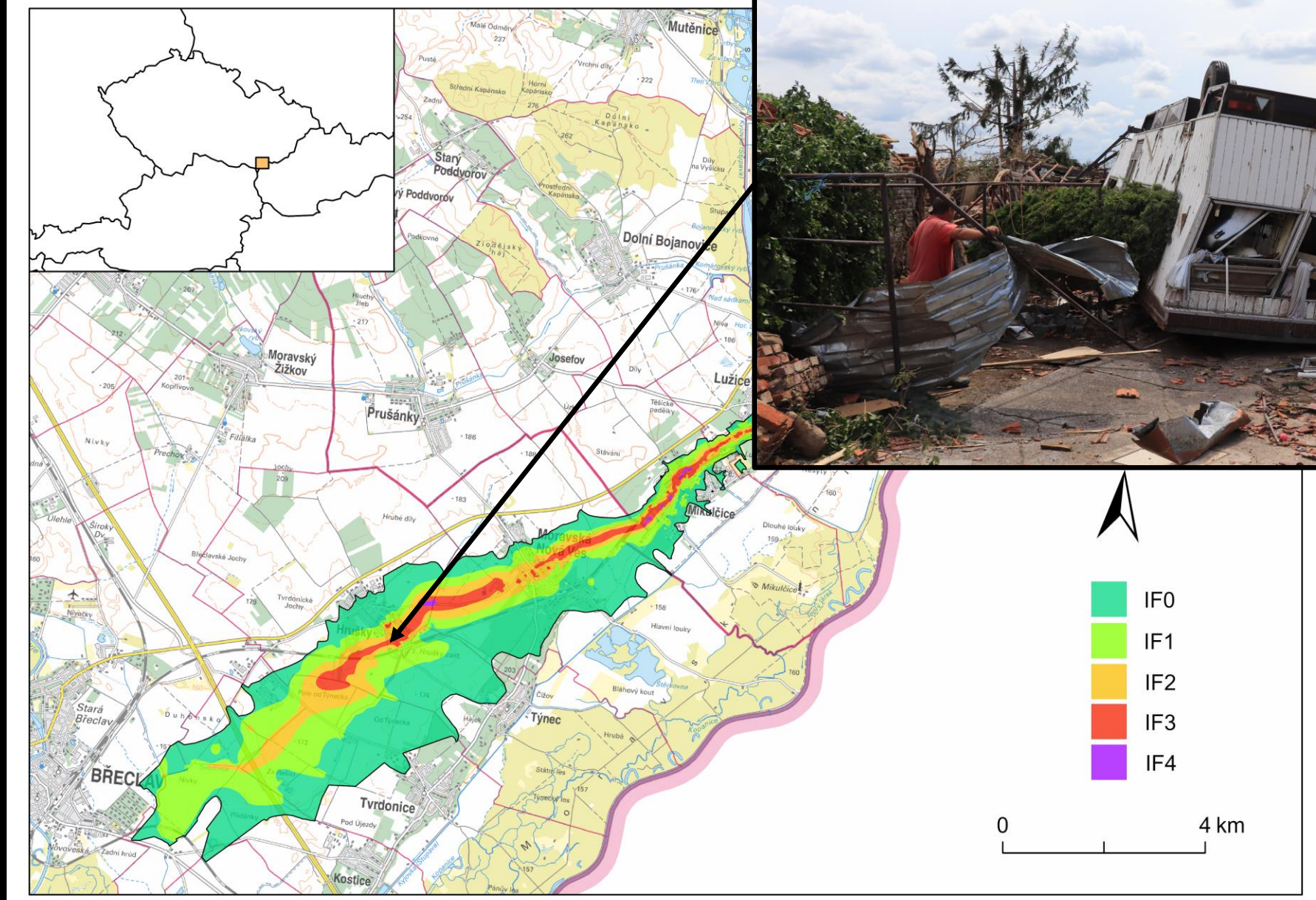

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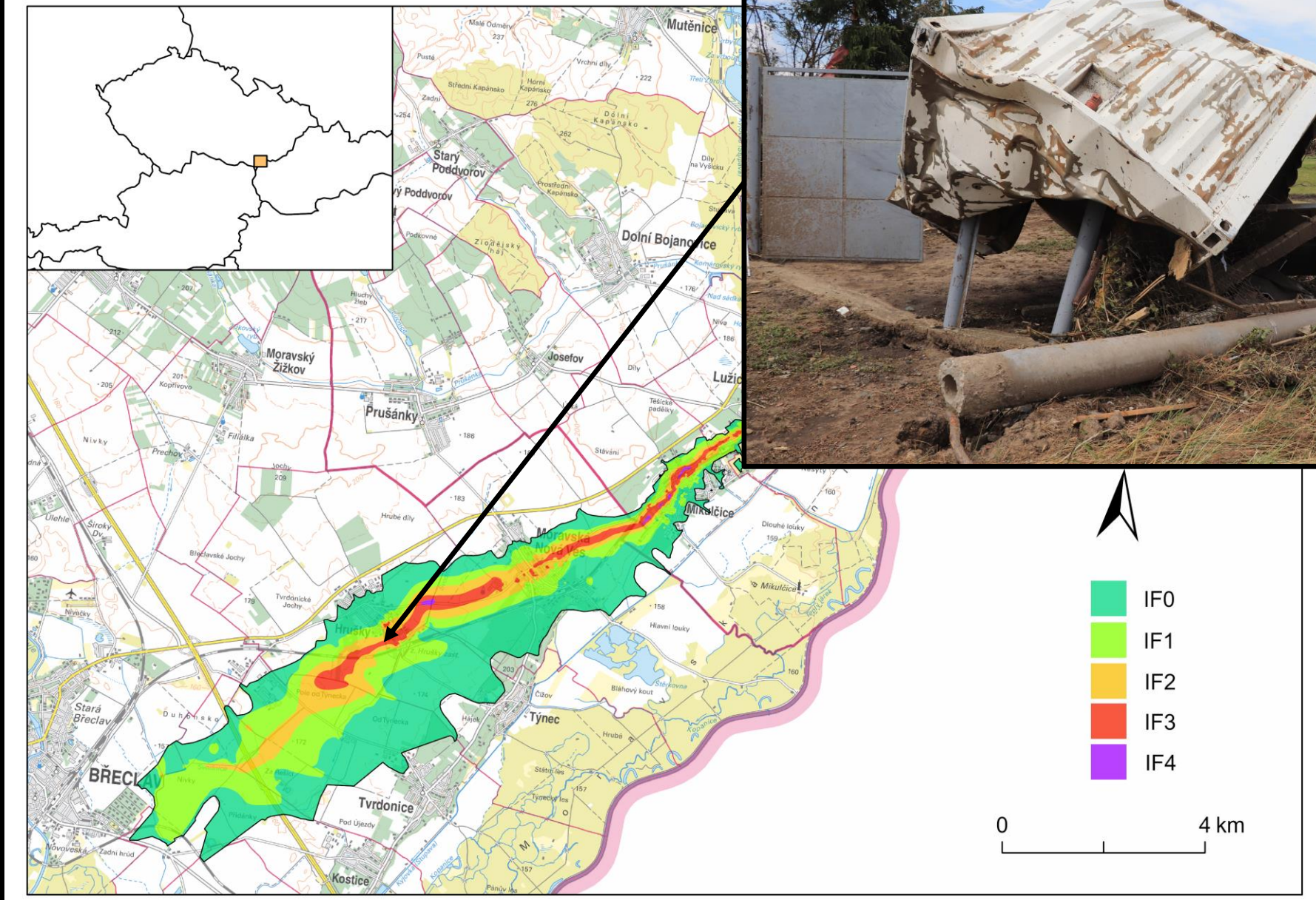
Notable damage



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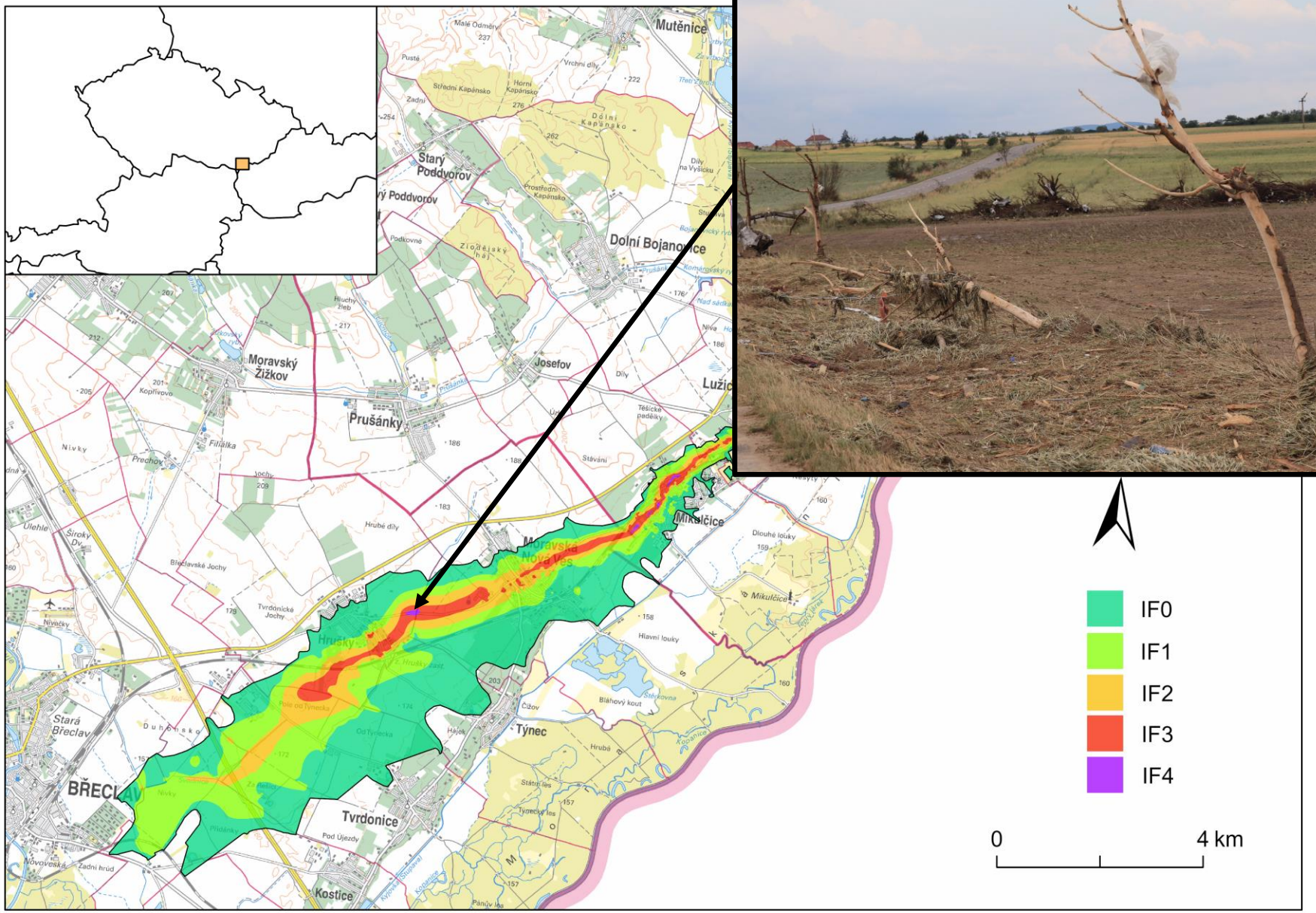
Notable damage



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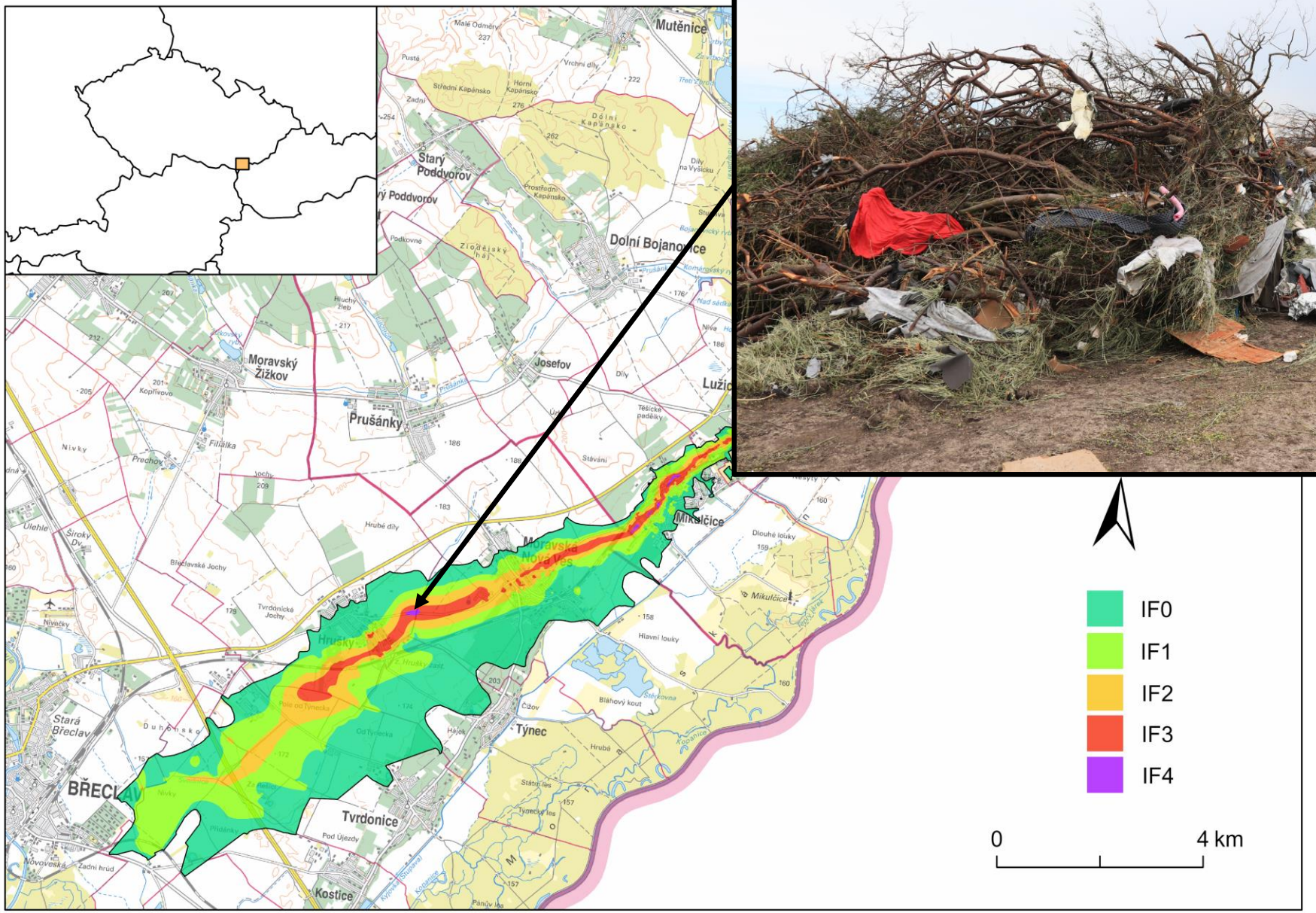
Notable damage



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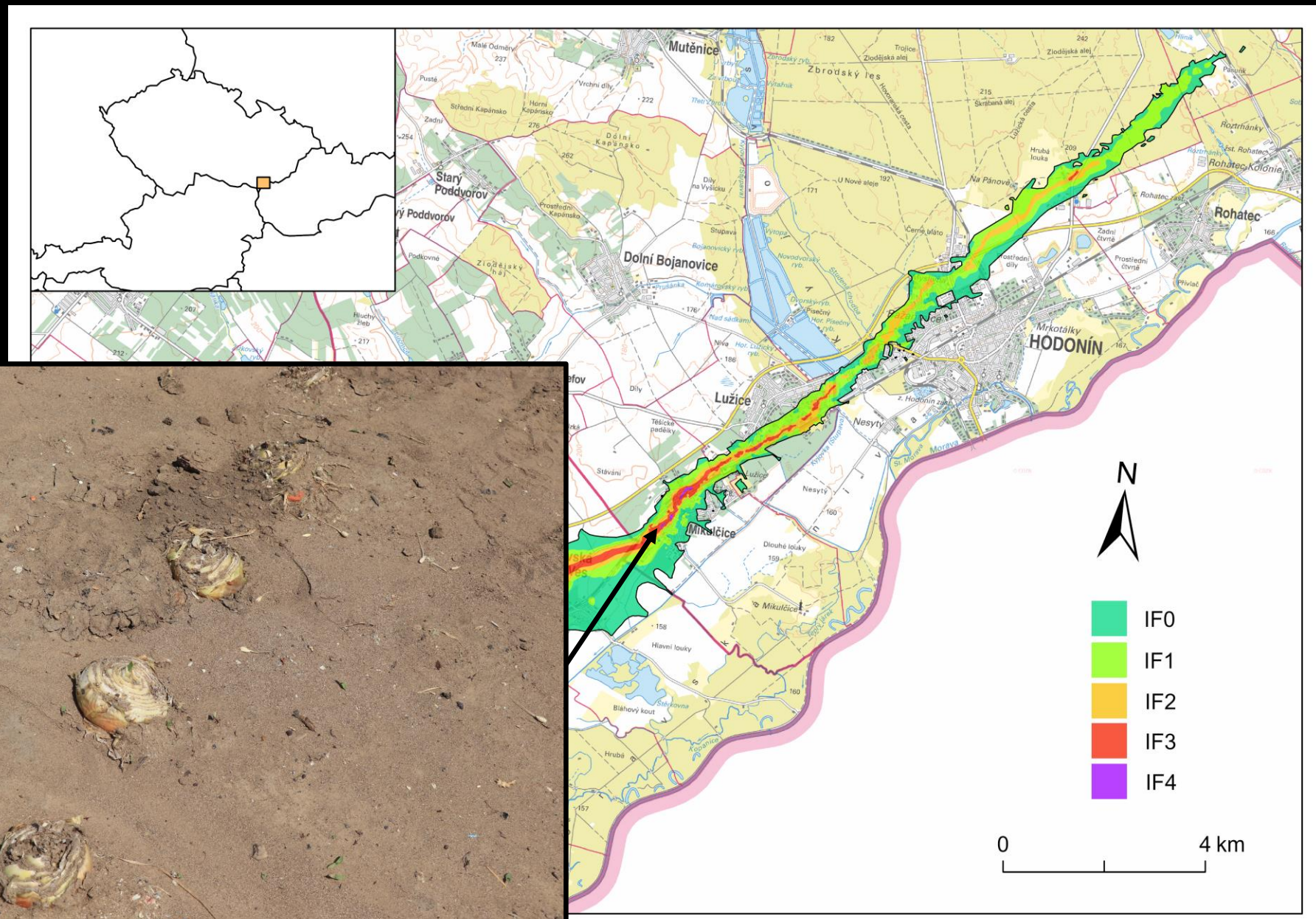
Notable damage



Notable damage

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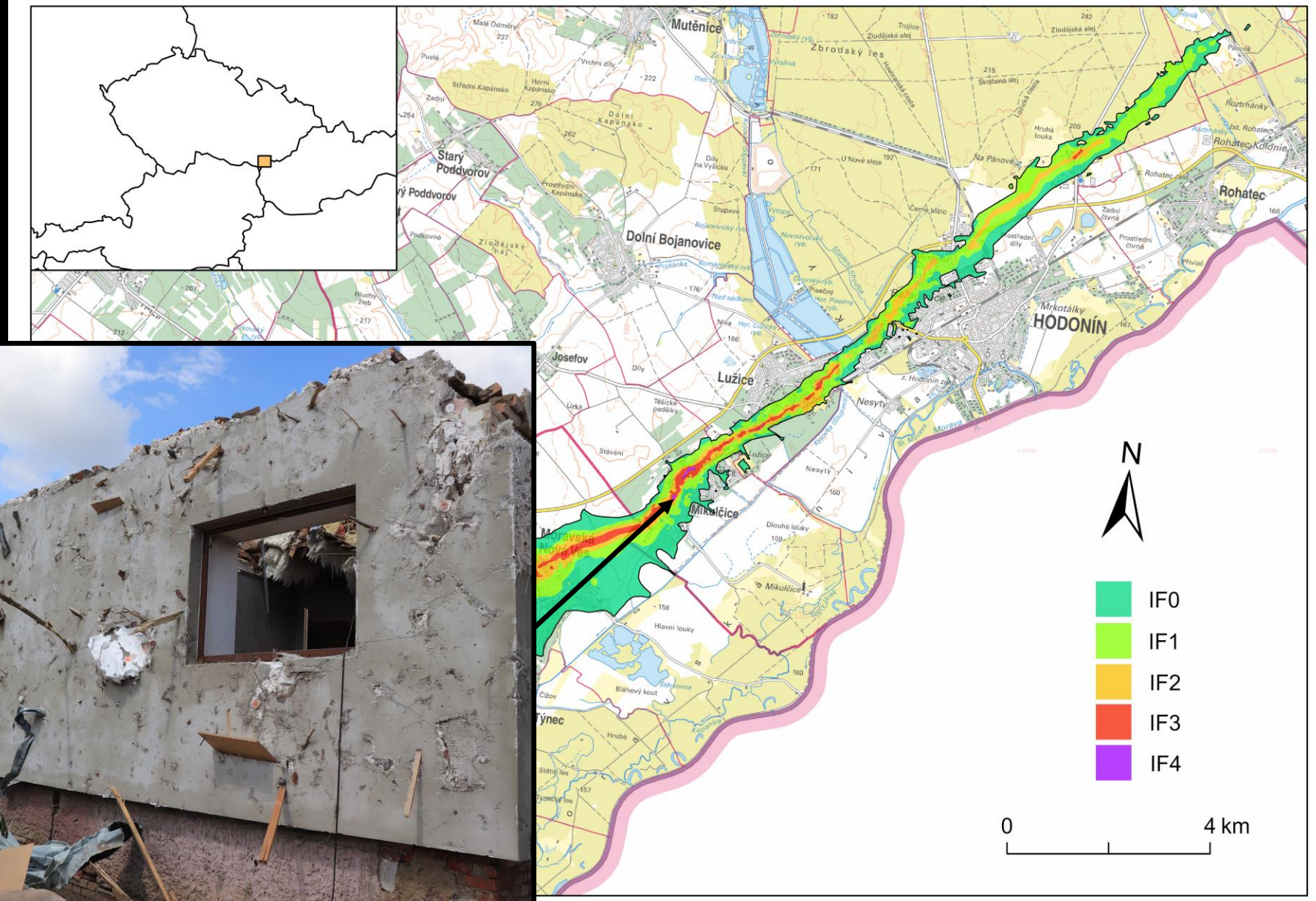

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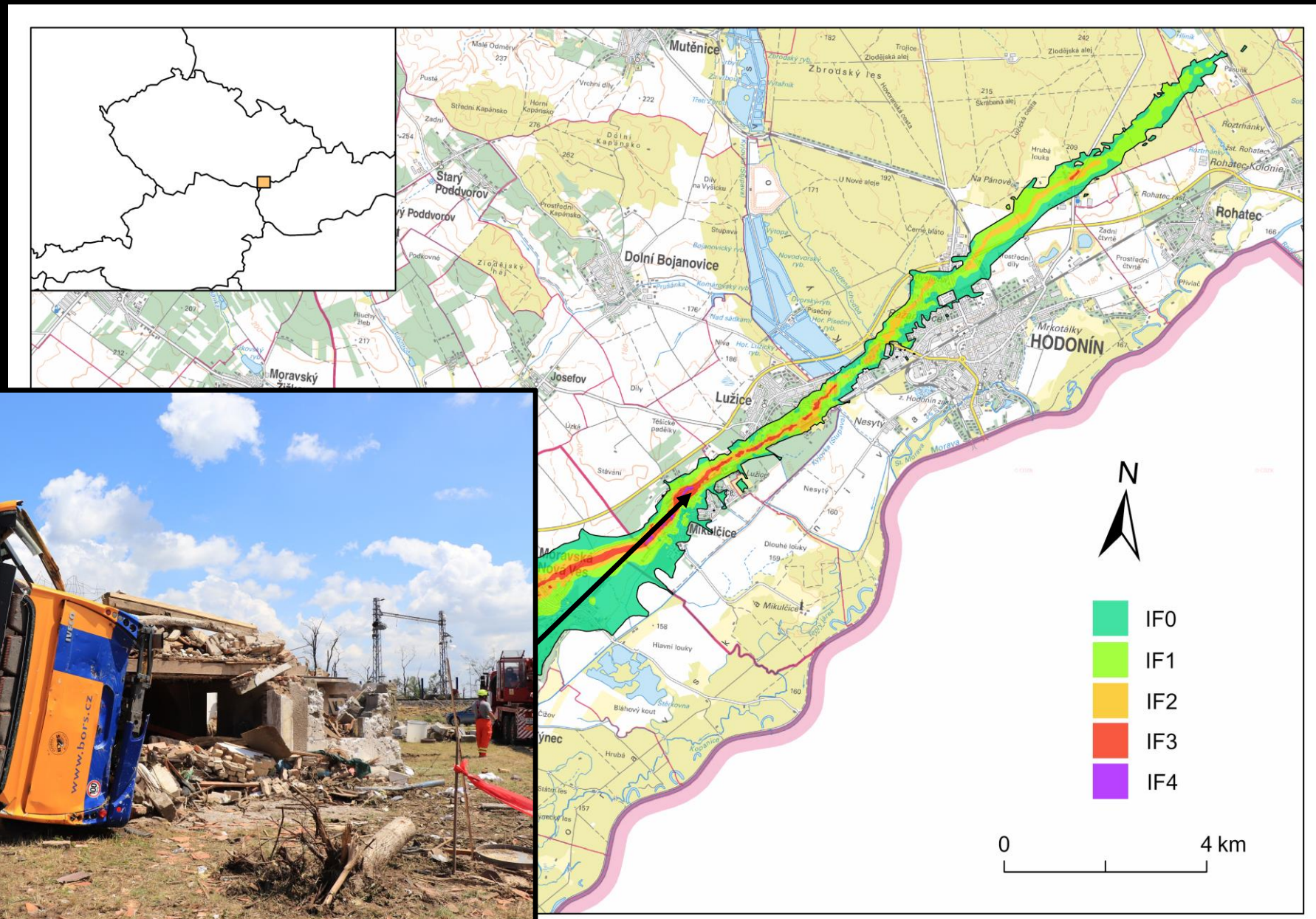
Notable damage



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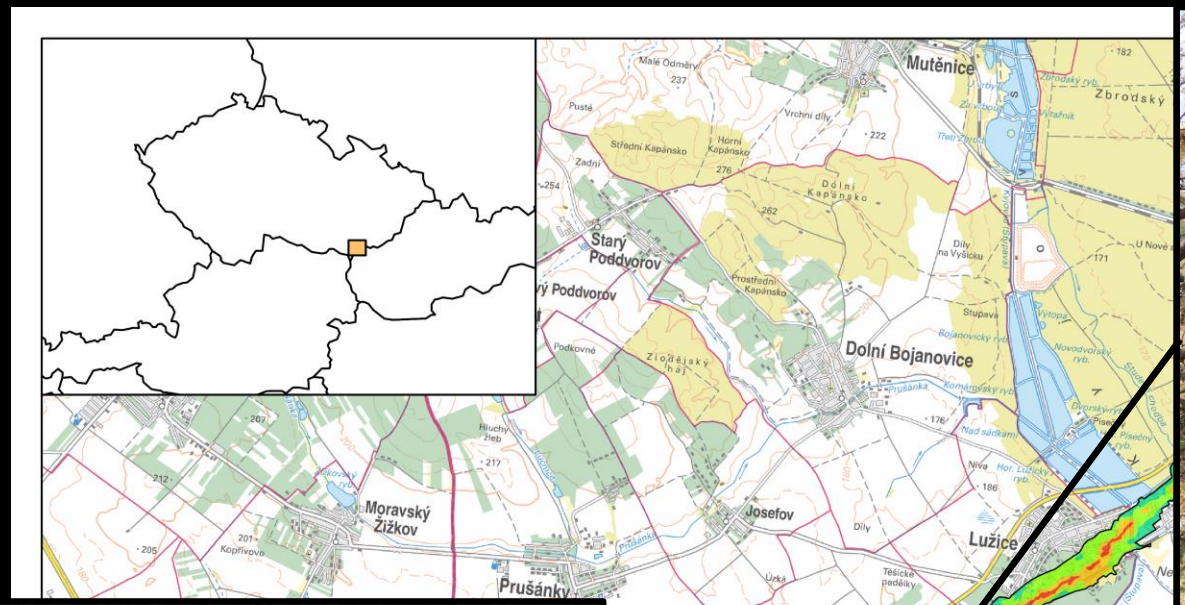
Notable damage



Importance of aerial imagery

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Importance of aerial imagery

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Importance of aerial imagery

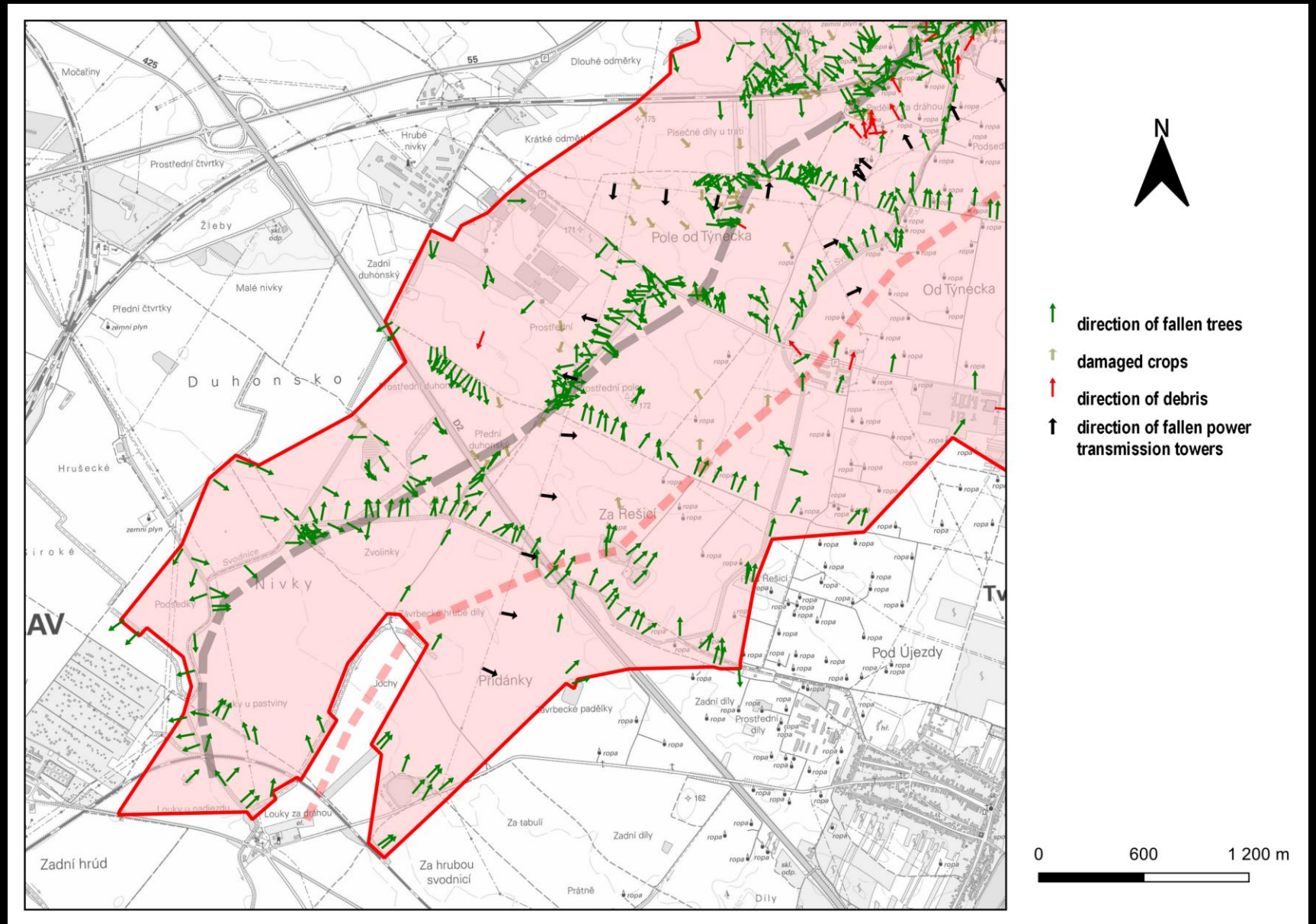
Indispensable tool

Benchmark for inflicted damage

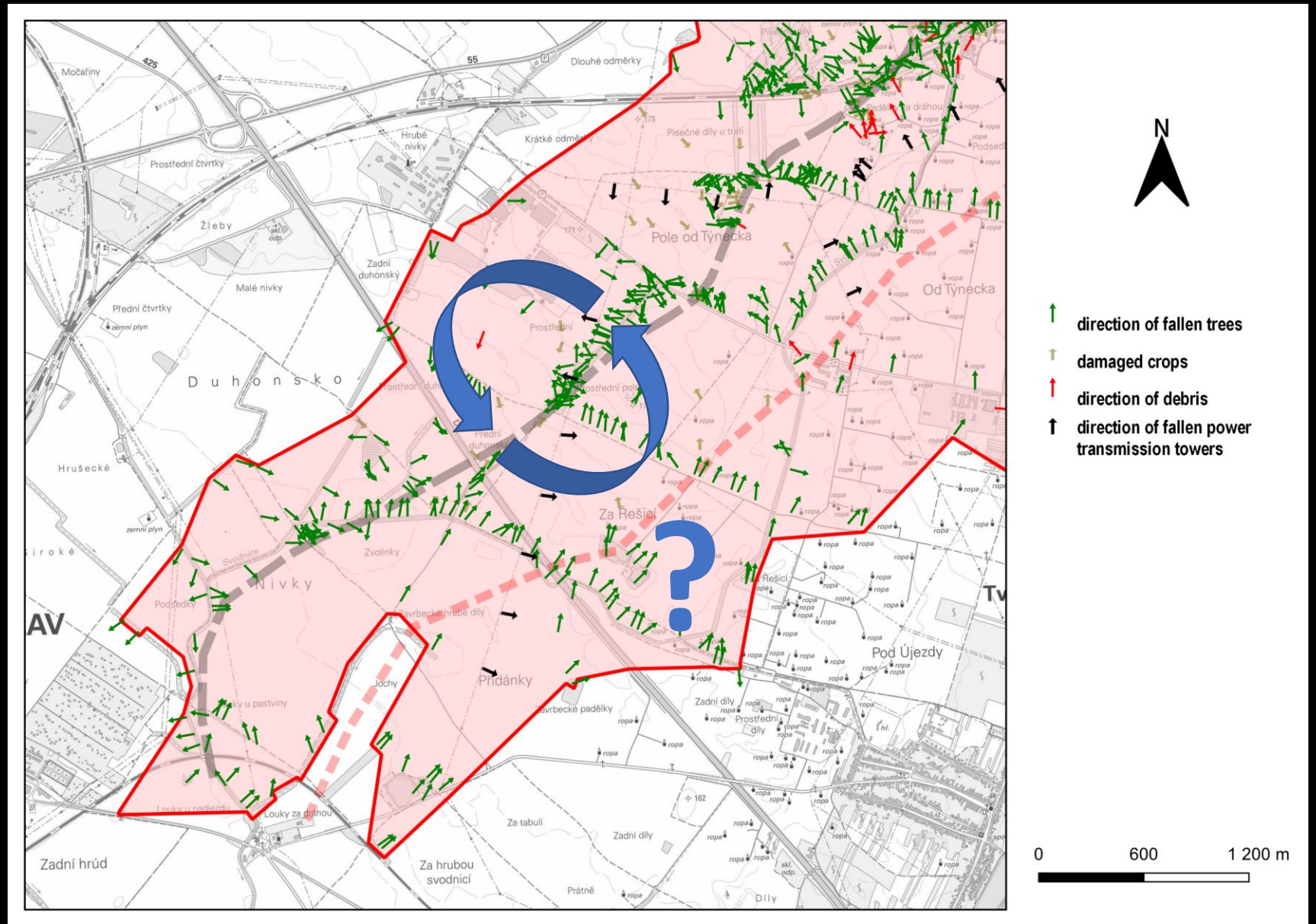
Establishing tornado path edges

Areas not surveyed from ground

Beginning of the path: Tornado vs the RFD



Beginning of the path: Tornado vs the RFD



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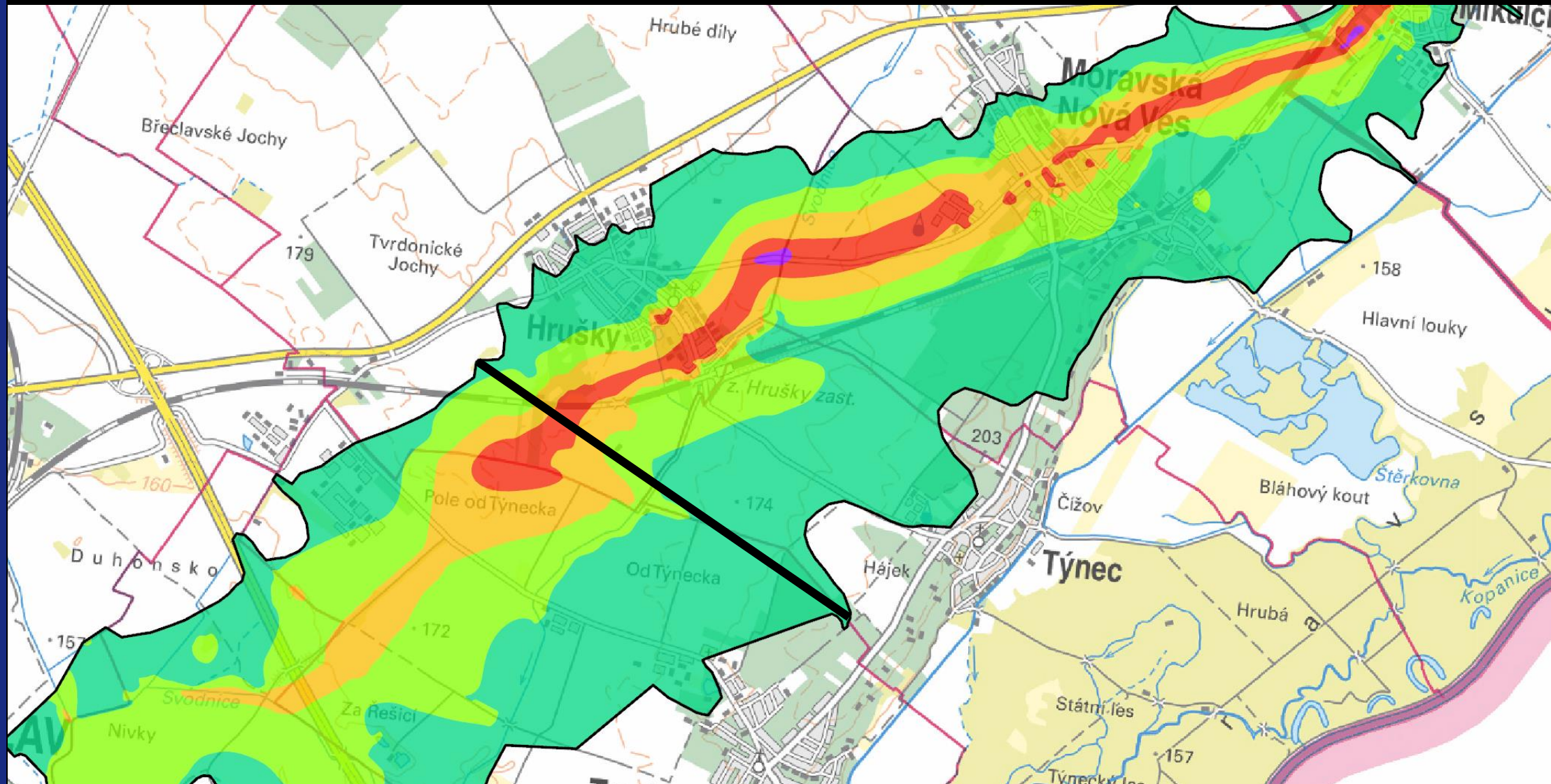
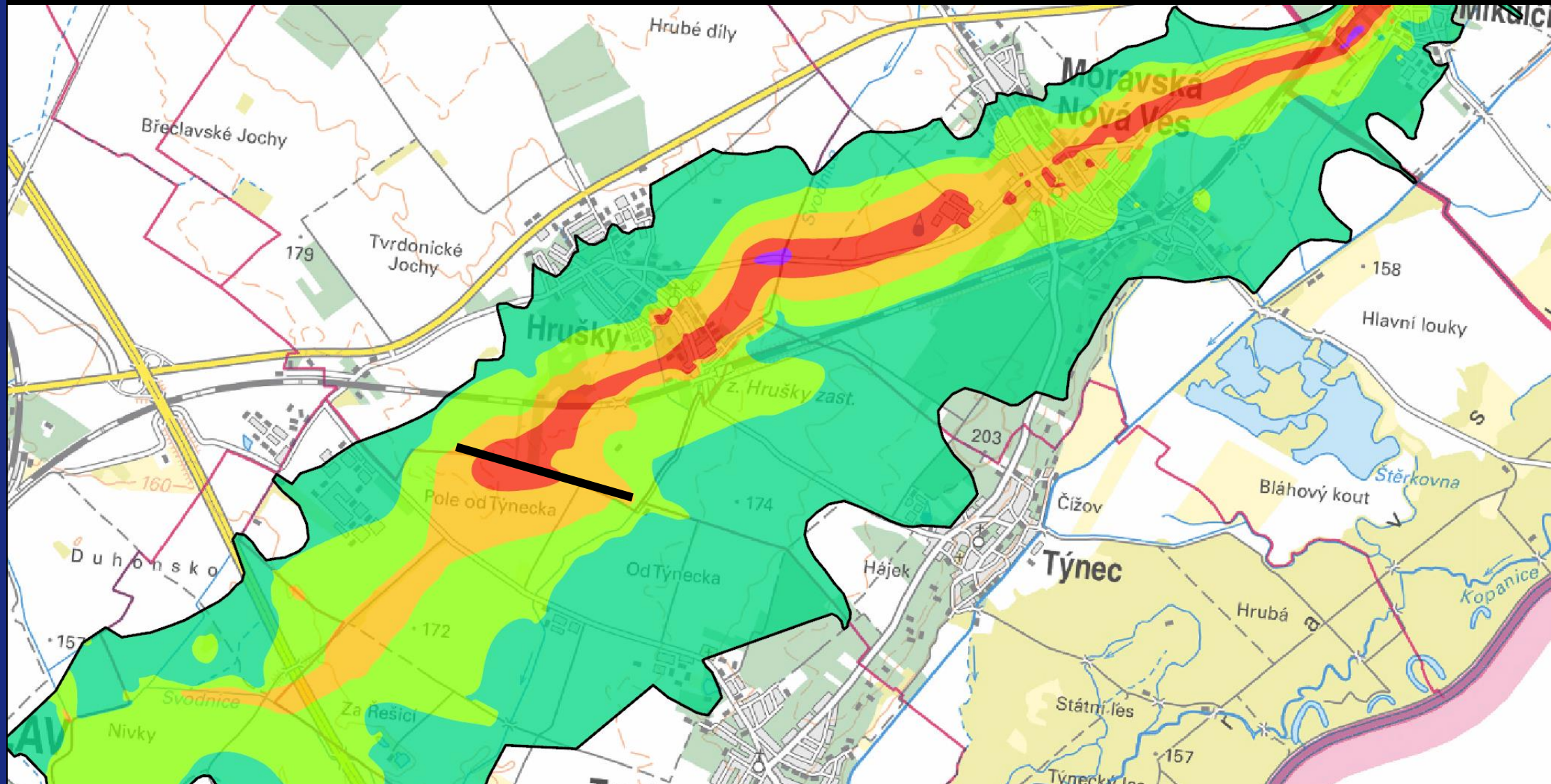
Width of the tornado

Maximum width up to around 3.5 km (tornado + RFD?)



Width of the tornado

IF2 or stronger winds maximum width up to 1.3 km



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IF2 – IF3 damage to the buildings

Destruction of the roof construction and parts of adjacent walls.

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IF4 damage to the buildings

Awarded to 14 buildings out of approximately 3000 affected (0.5%)

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IF4 damage to the buildings

Destruction of the load-bearing brick walls with thickness of 15+ cm

Societal impacts

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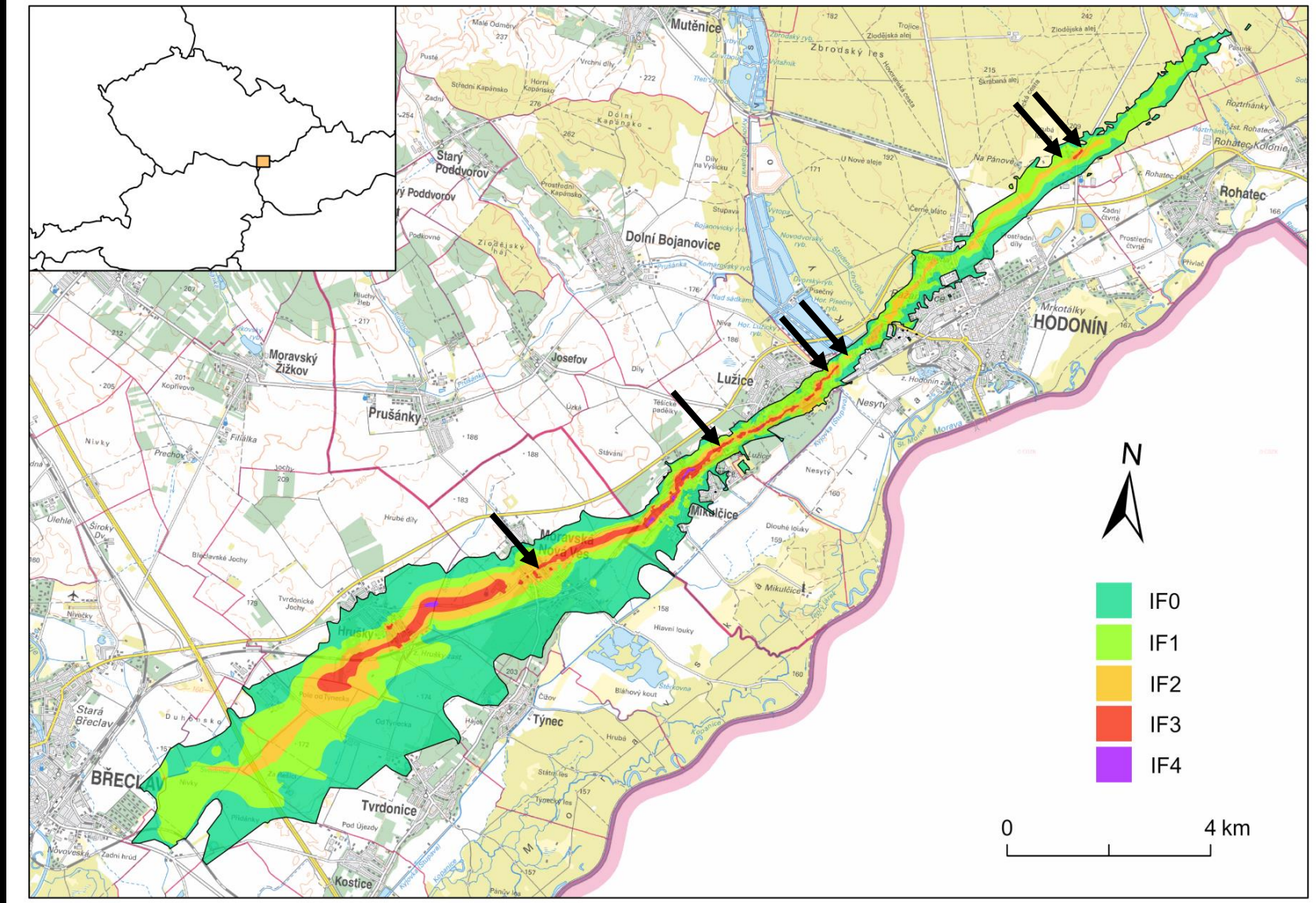
6 fatalities

1 in vehicle

3 in houses

1 cottage

1 outside



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Societal impacts

259+ direct injuries

317+ indirect injuries

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Societal impacts

COMMON CIRCUMSTANCES OF INJURIES:

People trying to close the windows due to strengthening wind.

People trying to find out what is going on.

Many seeking out the safest space when the wind became very strong

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Performing the damage survey

Chaos with organization

More time-consuming than thought

Lack of right equipment and footwear

No damage rating application

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Performing the damage survey

We need to be ready for such events!

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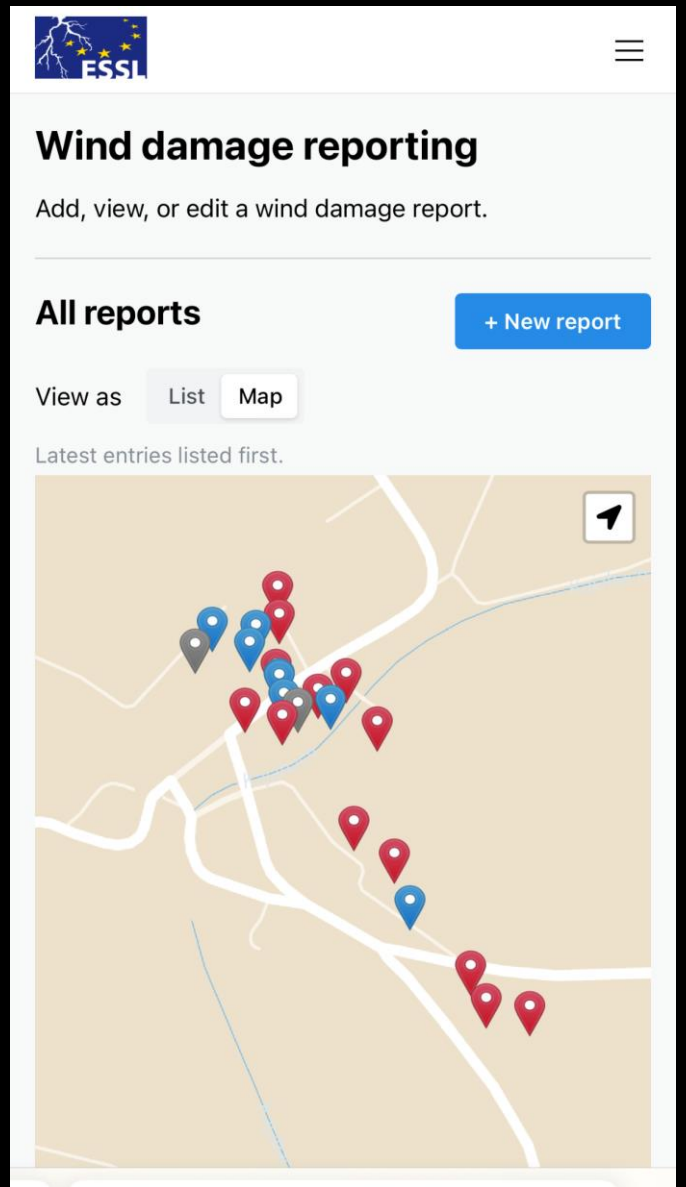
Damage rating application

Coming soon!



Internationality of the event

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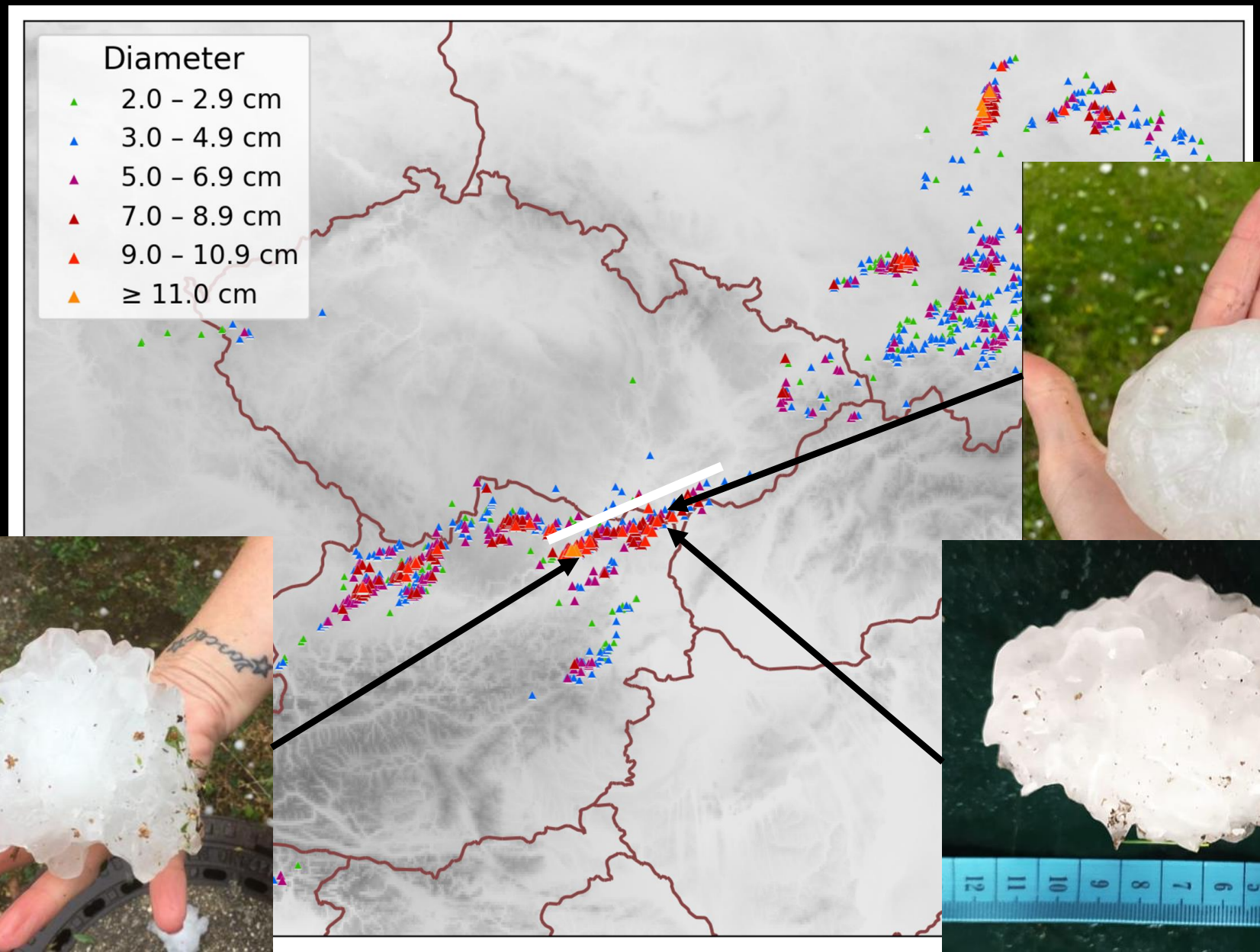
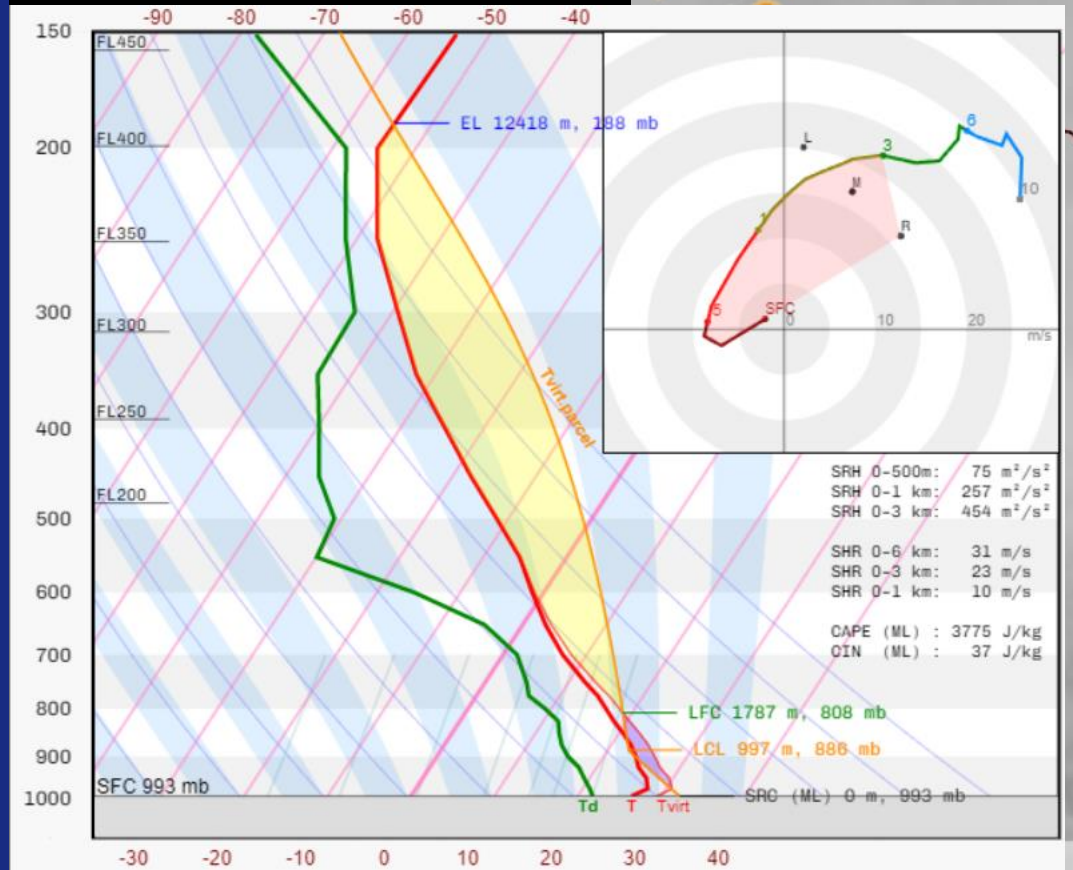
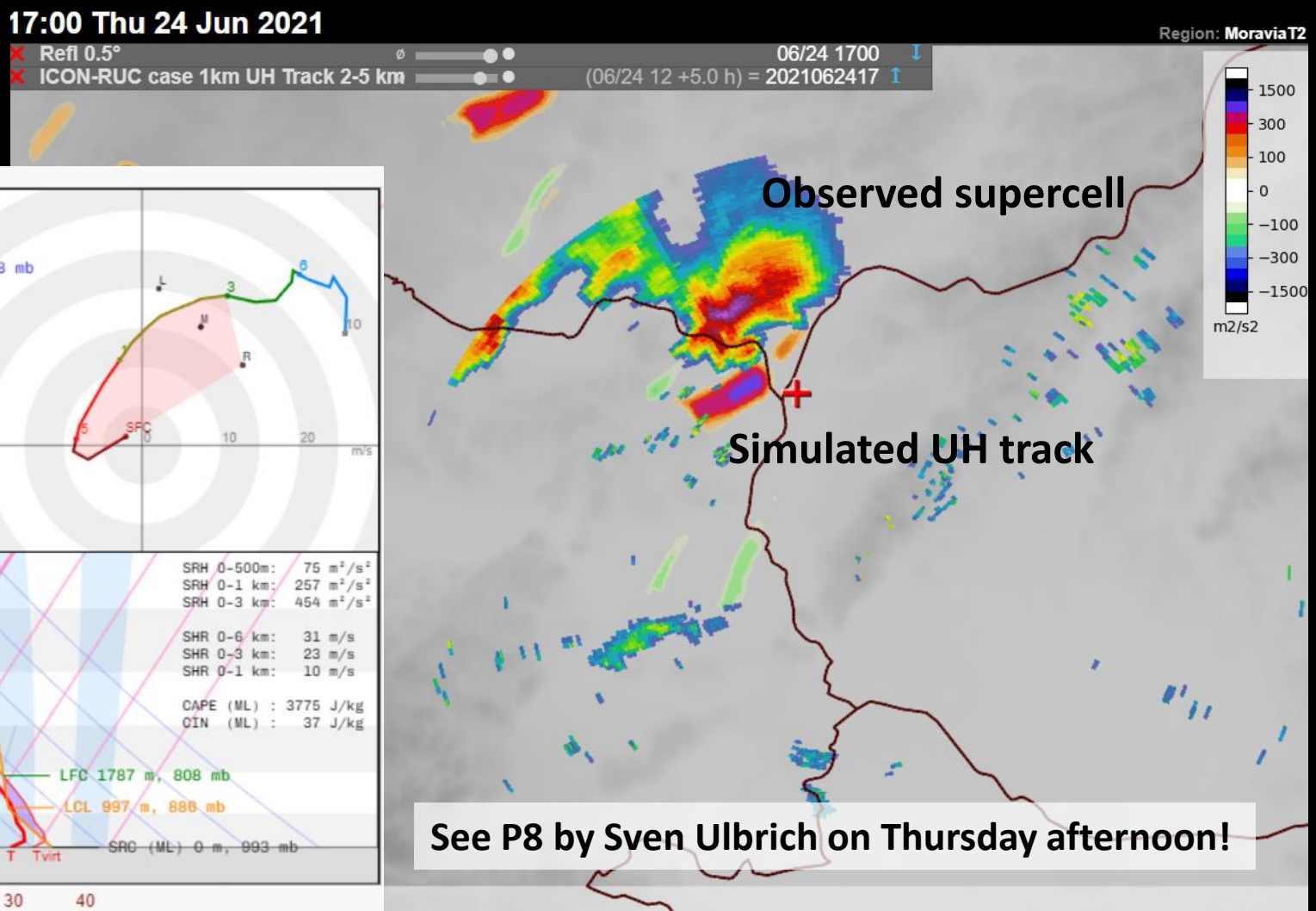


Event meteorology

Study ongoing





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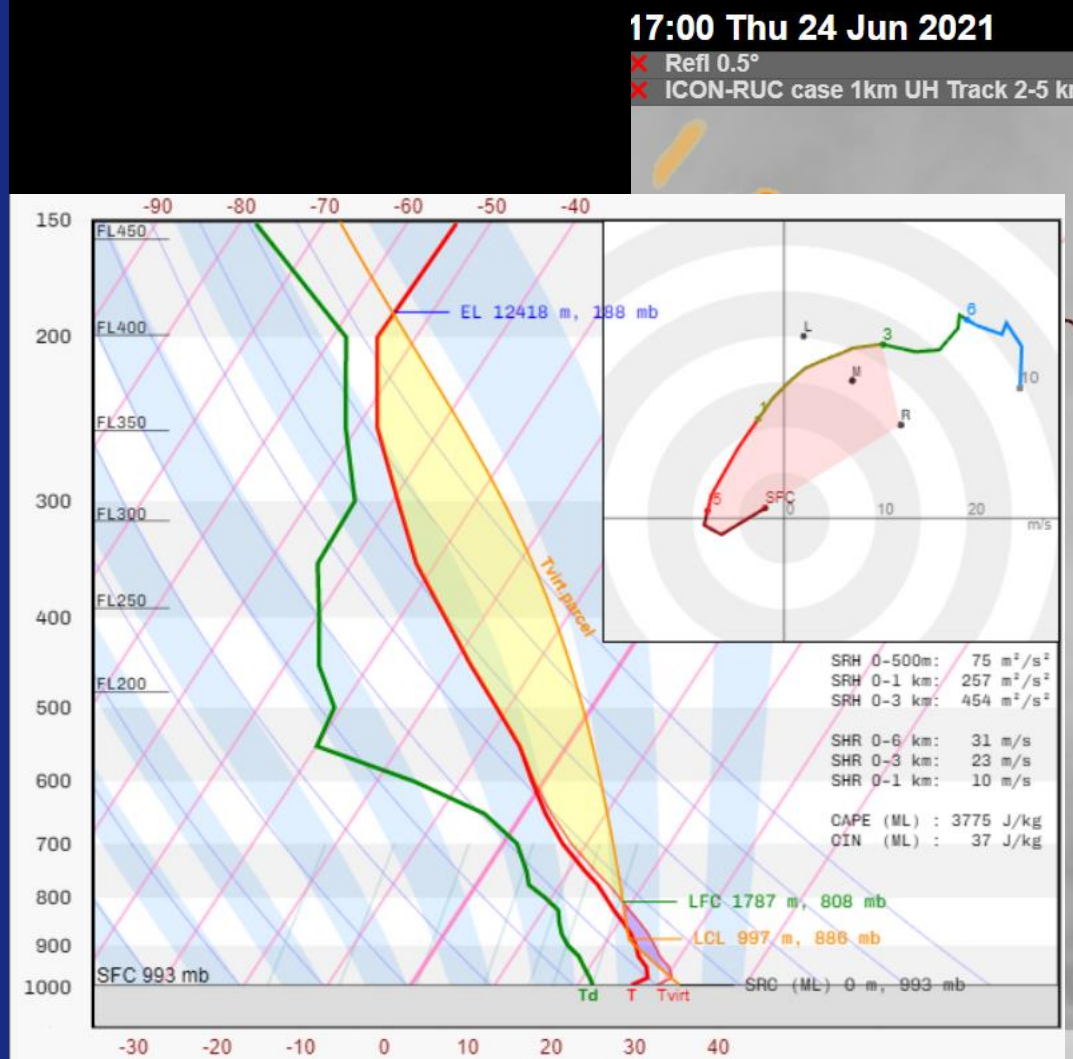
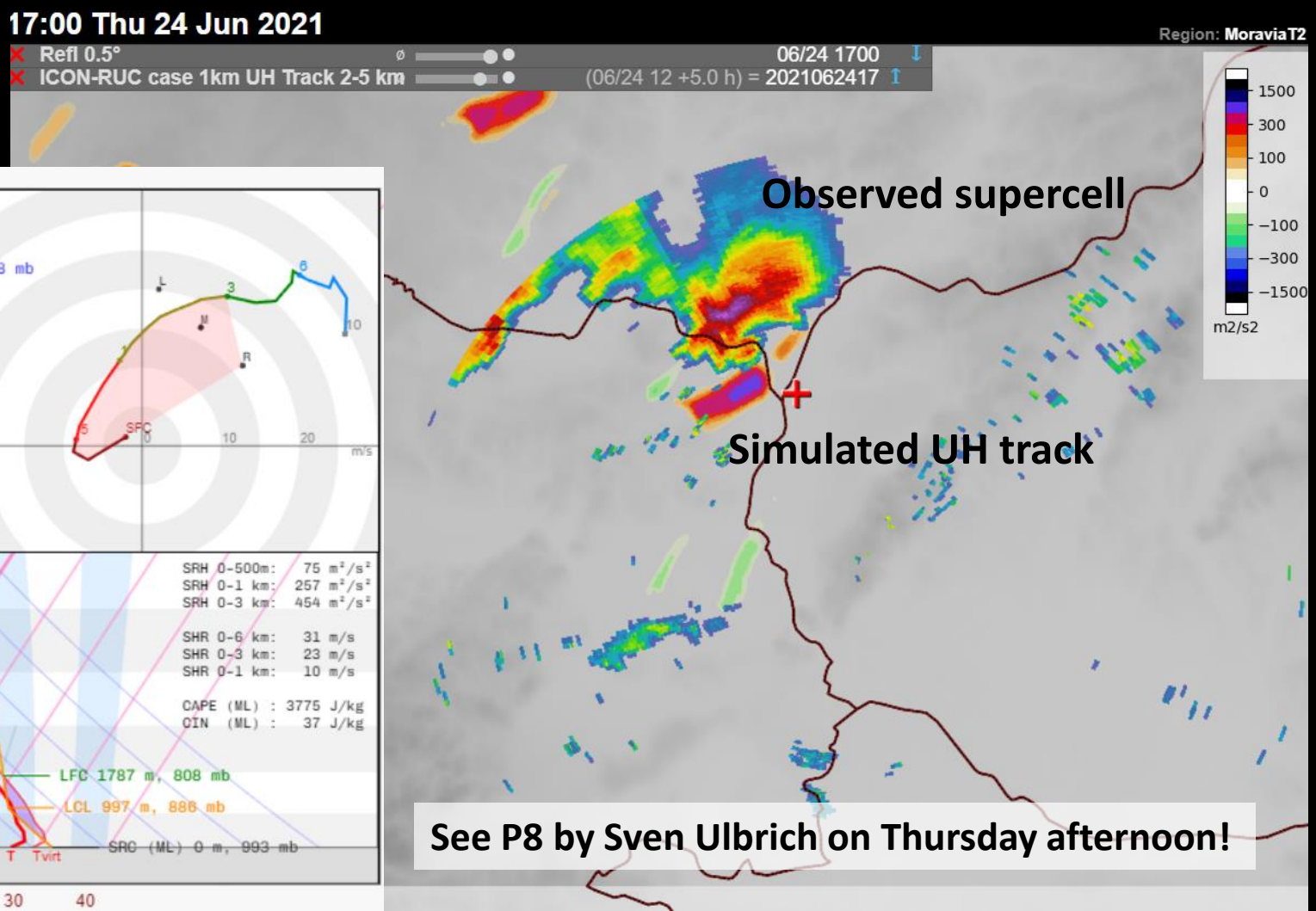
Event meteorology

Likely culprits: Evening low-level shear increase + storm merger





See P8 by Sven Ulbrich on Thursday afternoon!

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Conclusions

Need to be **prepared** for survey of such an event.

Heavy brick houses typically offered good protection in IF2 – IF3 winds

Better **communication** of the tornado risk to the public

International cooperation on the surveys and better meteorological data exchange