

Decision Support System (DSS) for winter road conditions -trial in the Czech Republic

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Klimator

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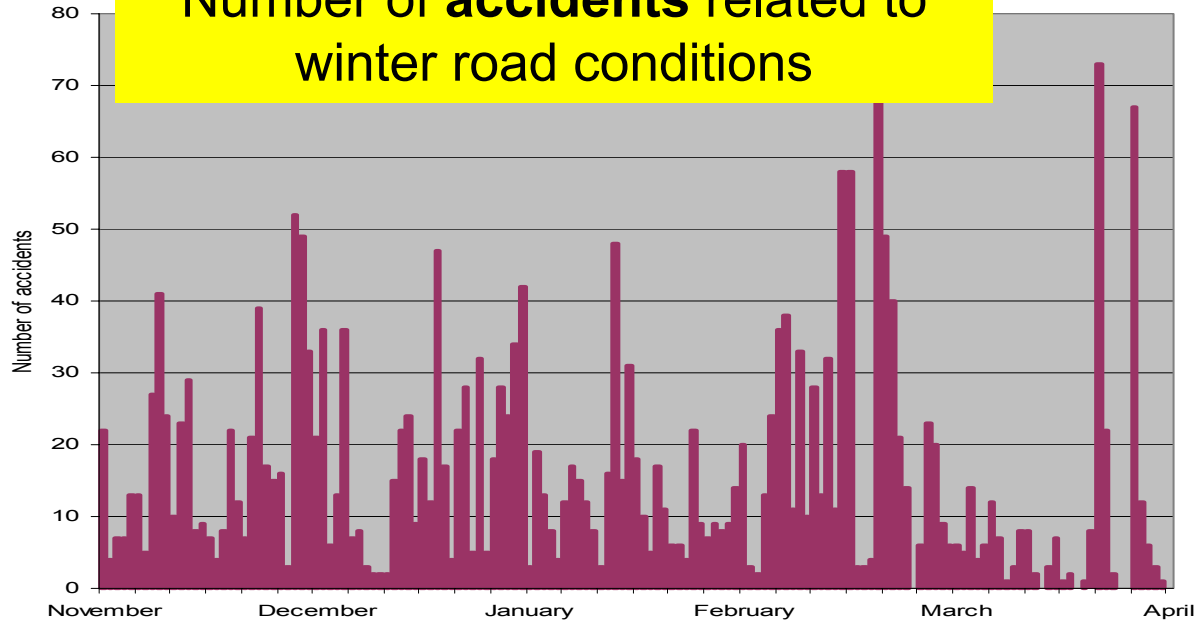
Cross, Zlin

A tool for taking the right decision regarding:

- When to perform activity
- Where to perform activity
- Type of activity

Do we need better road weather information?

Number of **accidents** related to winter road conditions



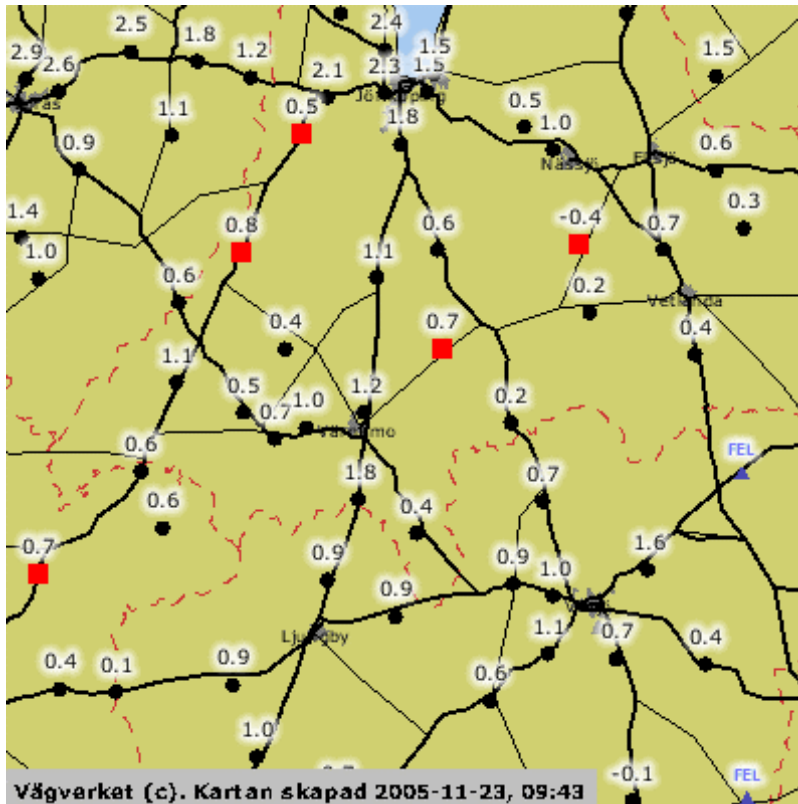
Delays

- Large costs for society
- Large effects on individuals



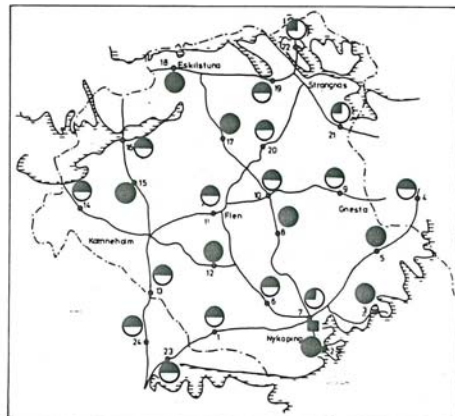
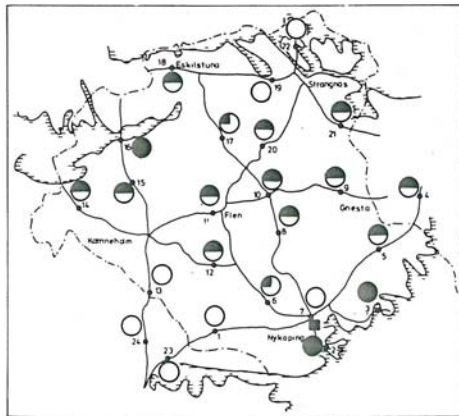
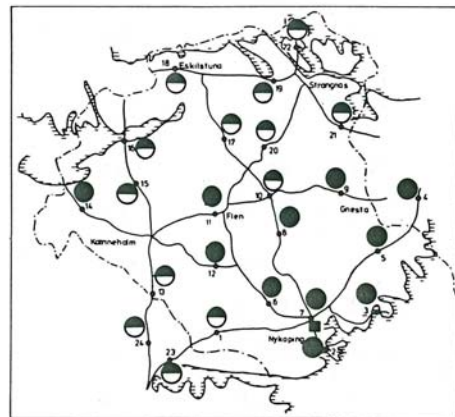
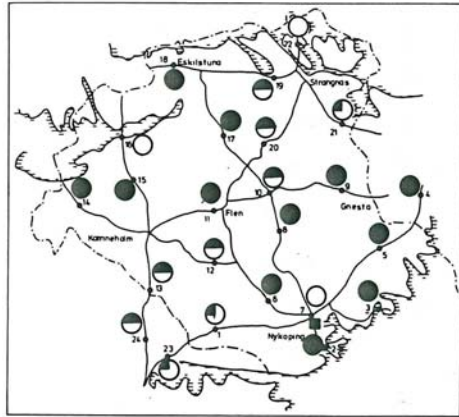
RWIS today

– how to use all the data?



*is salting
necessary?*

- Difficult to take the right decision
- A lot of data – confusing for non experts
- Very stressful / large responsibility for the maintenance staff



Variation in slipperiness intensity and extension (*Gustavsson, 1985*)

Our background

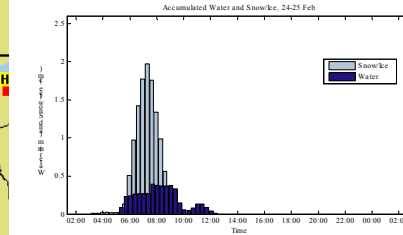
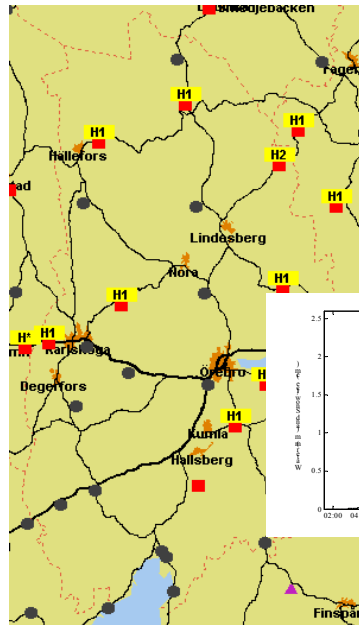
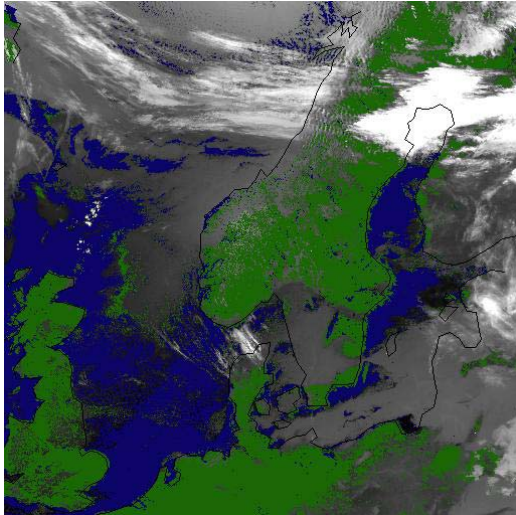
Dealing with Road

Climatology since the mid 1980ths

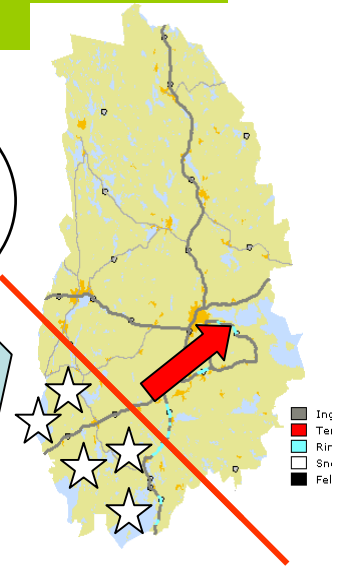
Developed models for:

- 1) Local temperature and slipperiness forecast (RoadCast)
- 2) Temperature and slipperiness variations along roads (LCM)
- 3) Weather model for calculation of slipperiness severity
- 4) Road slipperiness distribution (RSDM)

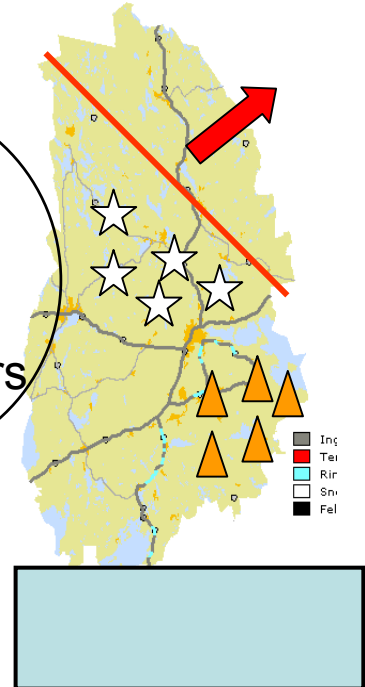
Idea behind DSS



Road conditions
"prevailing"



Road cond
prognosis
1 to 12 hours

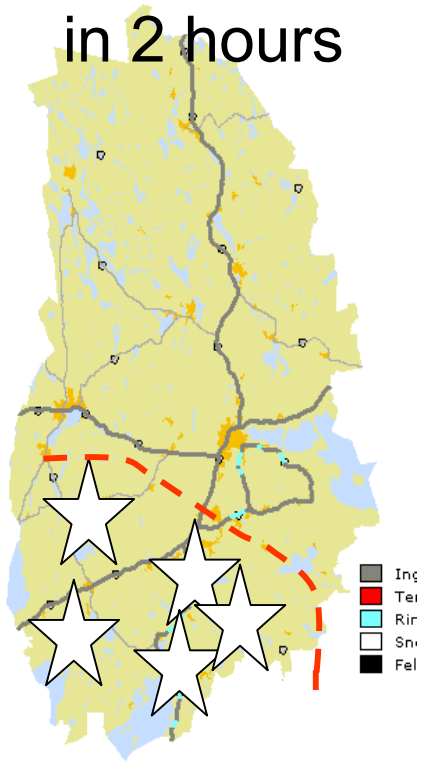


Weather parameters
Frontal movements
Cloud amount
Precip.

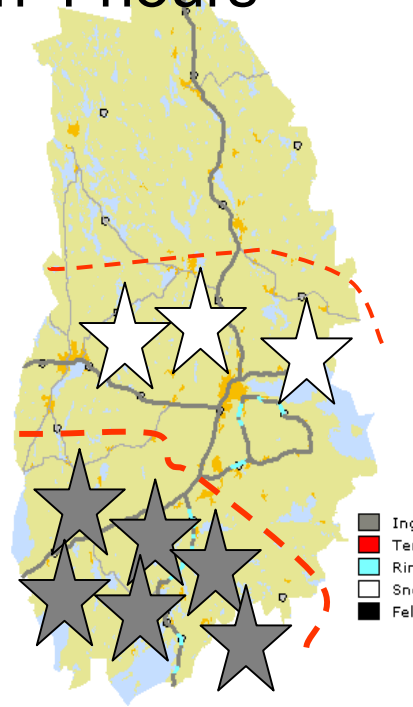
RoadCast
calculation for:
-RWIS-stations
-Road stretchens
-Areas

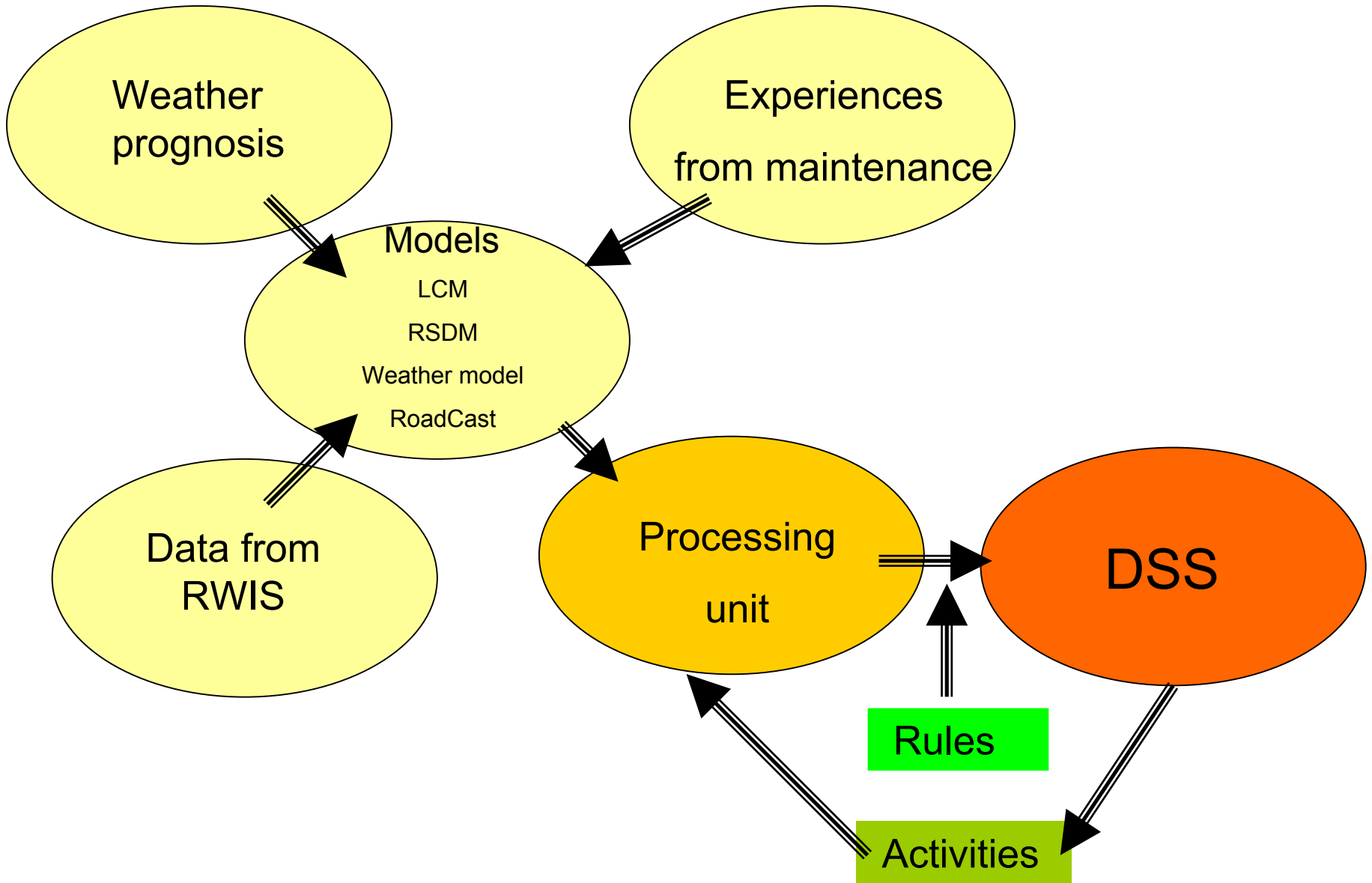
Intensity of slipperiness

in 2 hours

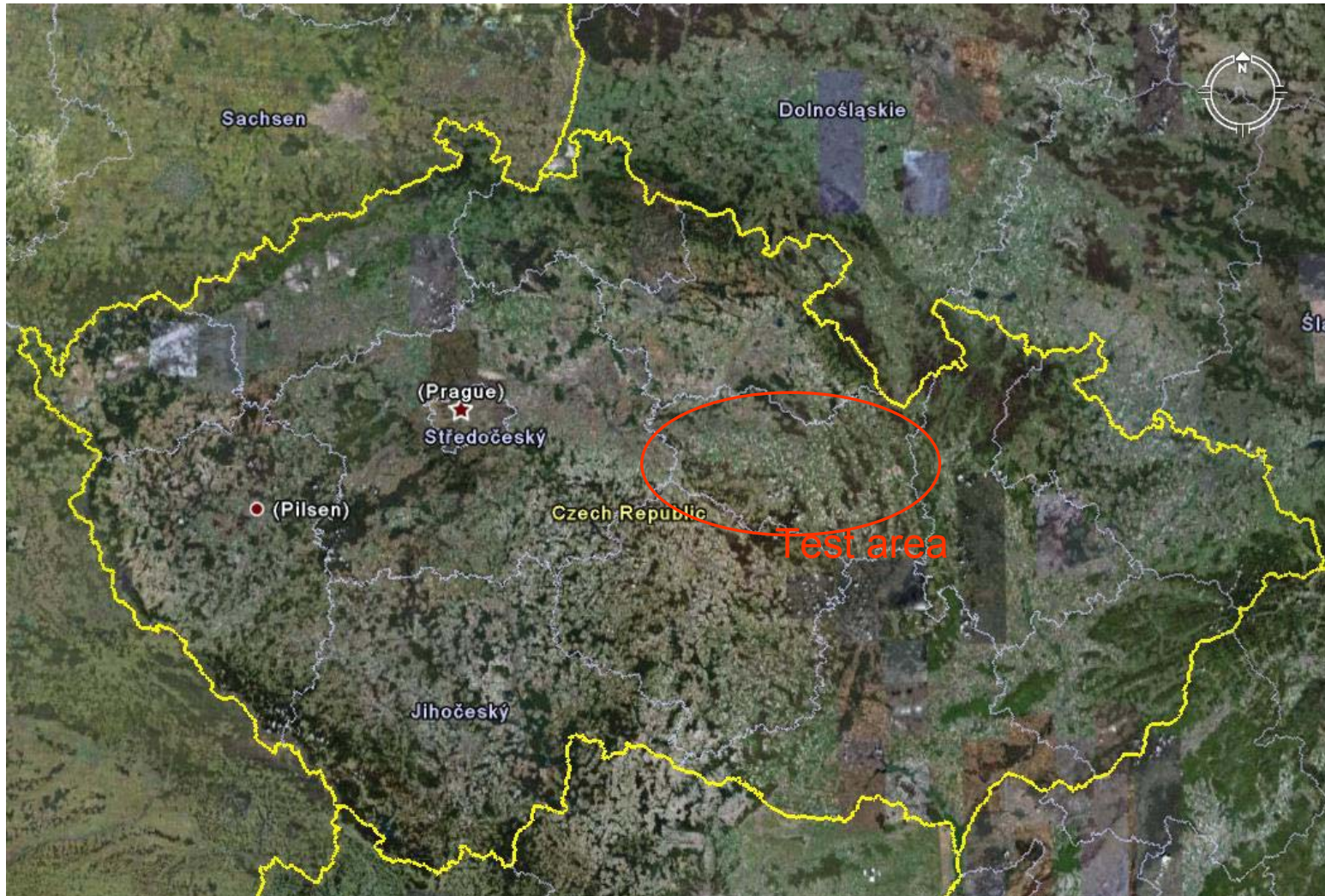


in 4 hours

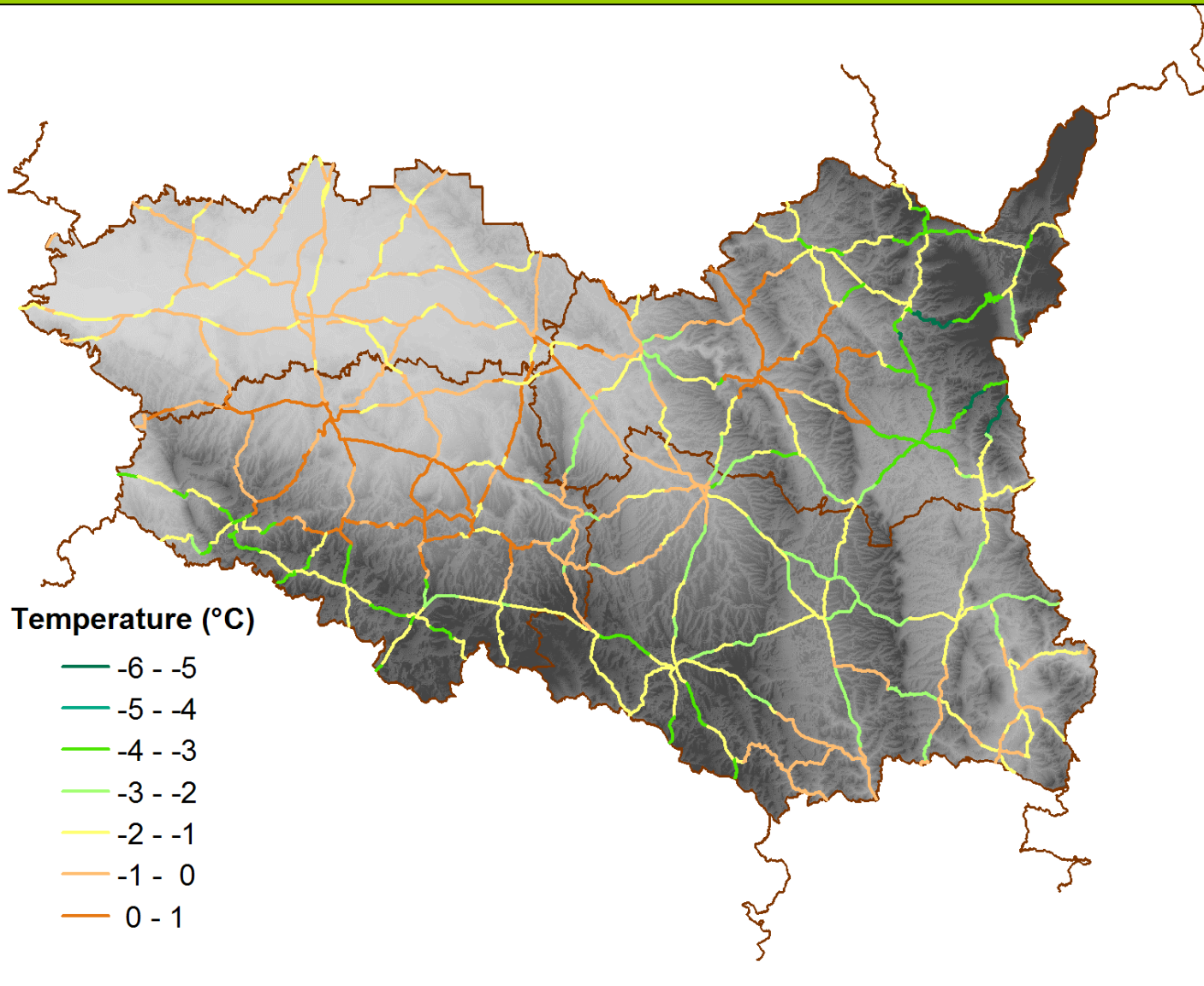


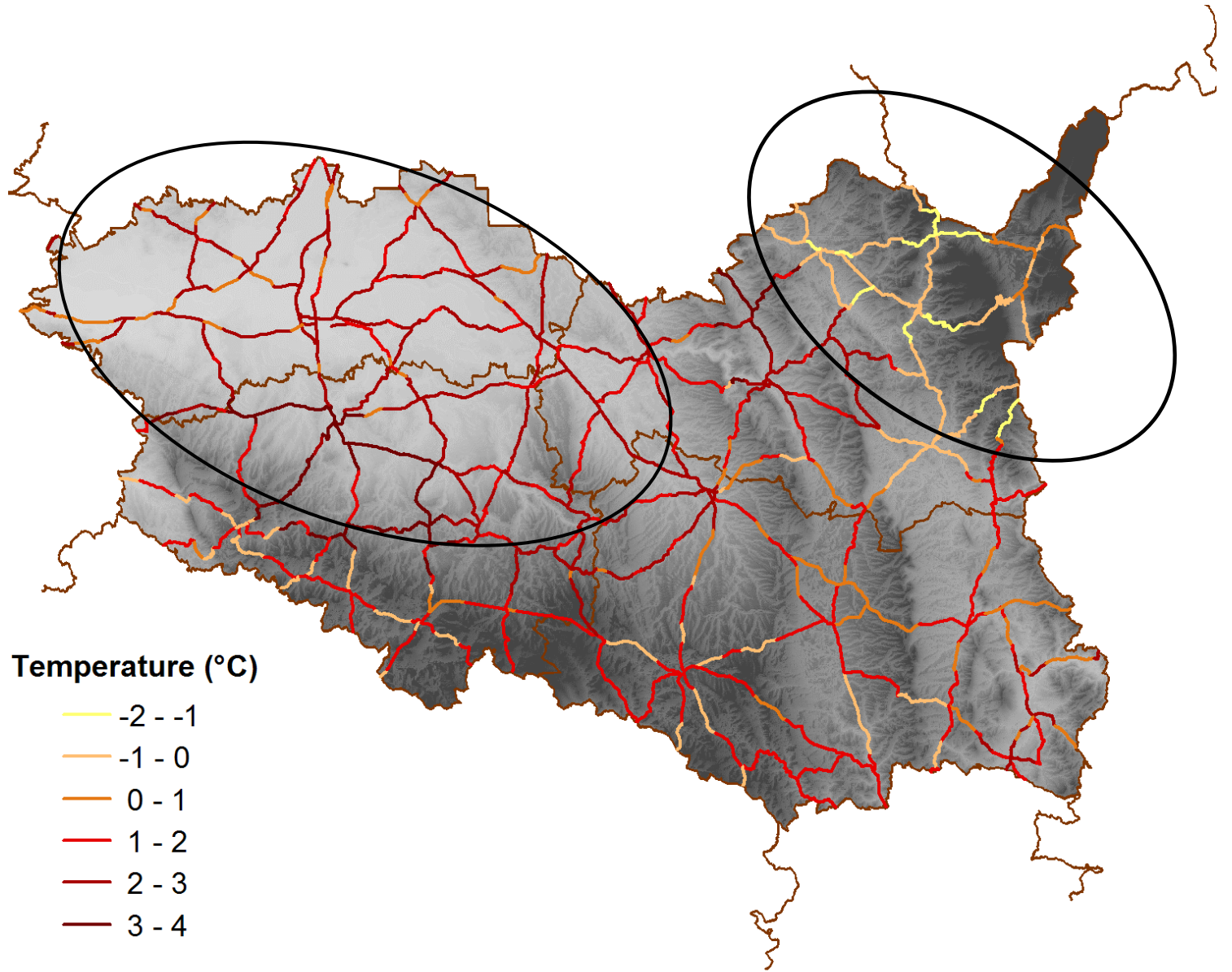


Test area in the Czech republic



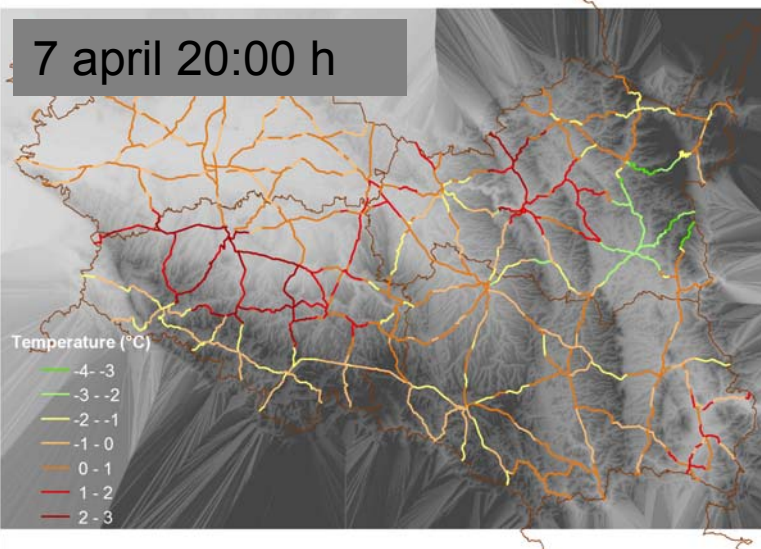
Surface temperature



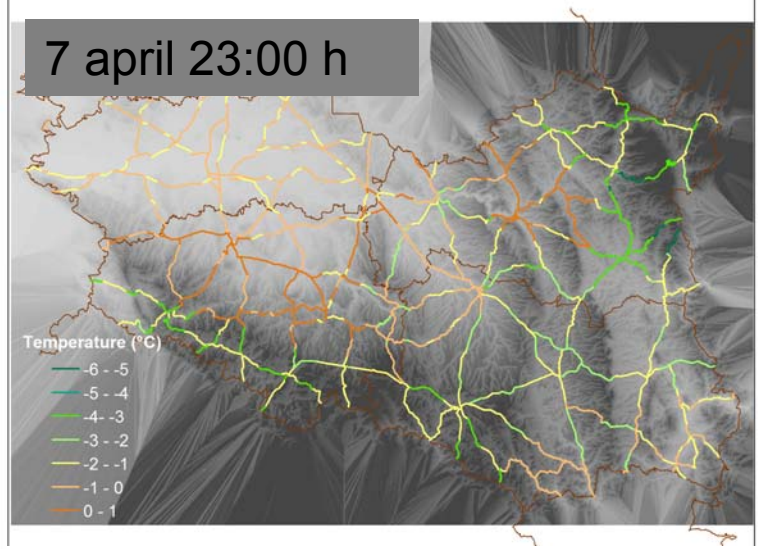


Surface temp. development

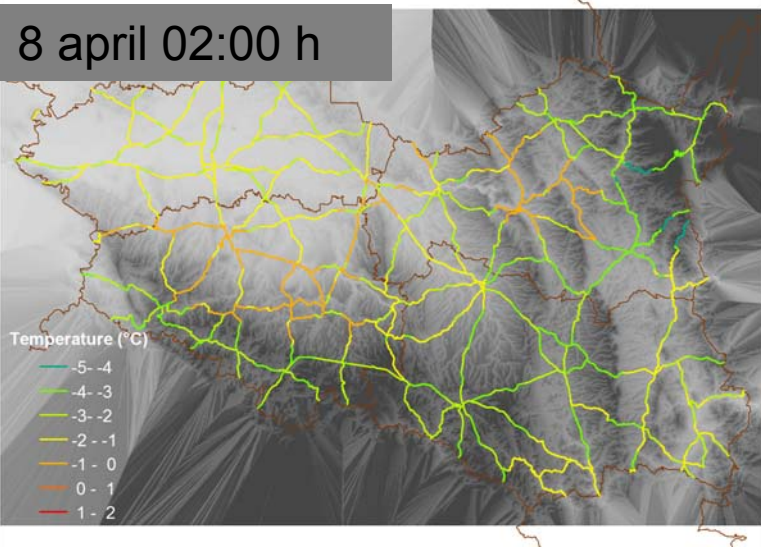
7 april 20:00 h



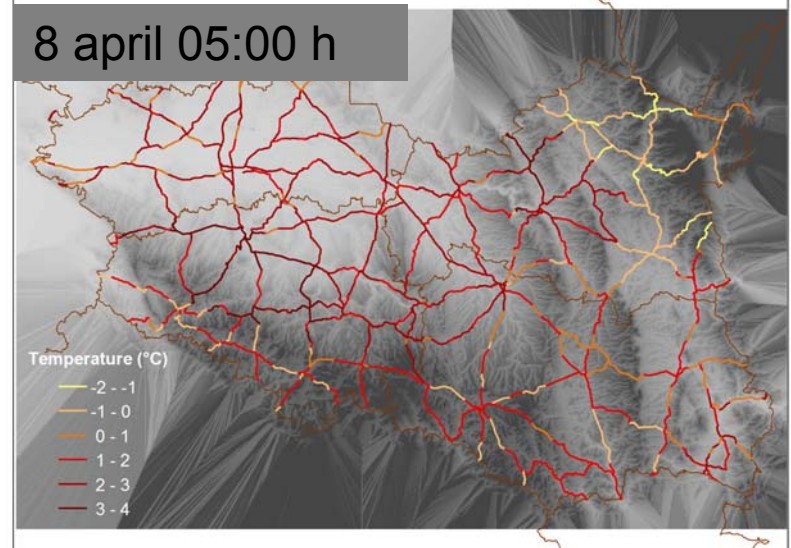
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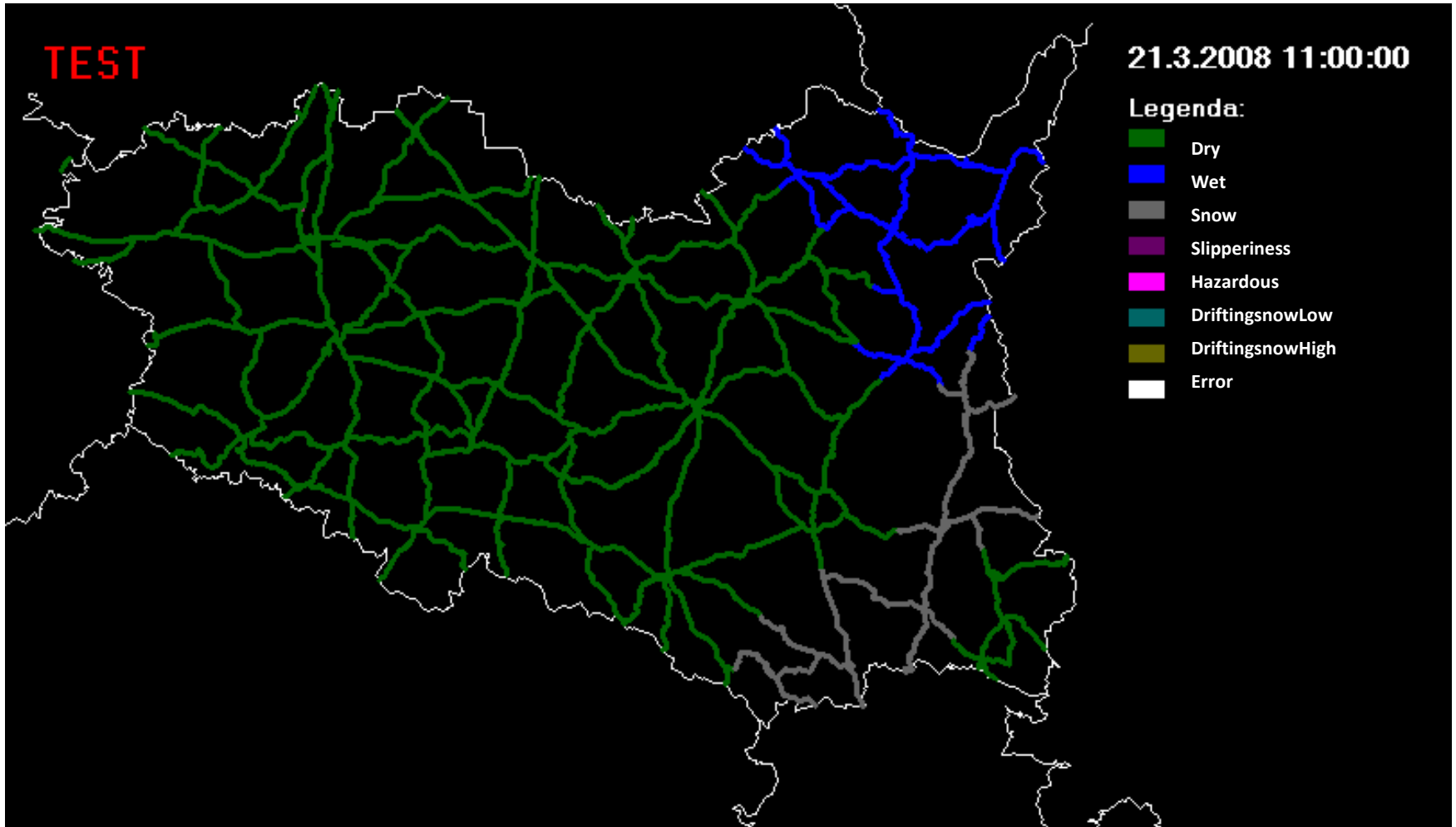
8 april 02:00 h



8 april 05:00 h



Road conditions

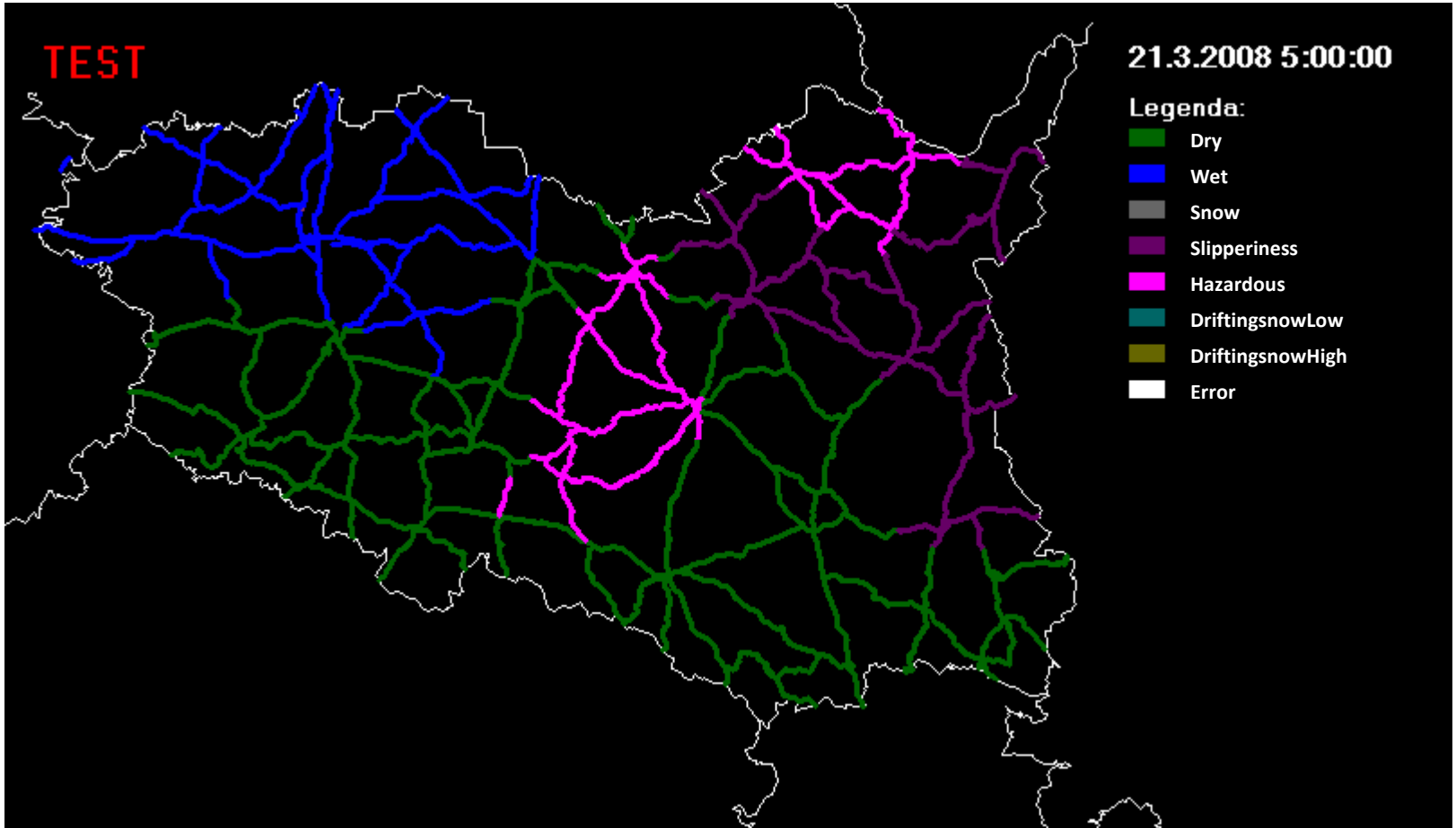


TEST

21.3.2008 5:00:00

Legenda:

- Dry
- Wet
- Snow
- Slipperiness
- Hazardous
- DriftingsnowLow
- DriftingsnowHigh
- Error



Implementation of the DSS-model

- Geographical parameters
 - Elevation
 - Topographical information
 - Land use
- Climatological information
 - Thermal mapping
 - Climatological subdivision of areas
 - Field survey
 - Classification of RWIS
- Infrastructure
 - Road network
 - Type of roads, traffic volume
- Maintenance
 - "Rules" of practice
 - Local knowledge by experience

Conclusions from the trial last winter

- An ordinary RWIS can be improved by use of a DSS
- Gives information about
 - Surface temperature in the entire surveillance area
 - Road conditions in the area
- Present situation and forecast for the coming 12 hours helps in planning

A photograph of a road winding through a winter forest. The trees and branches are heavily covered in snow, creating a dense, white canopy. The road is also covered in snow, with a yellow line visible in the foreground. The overall scene is bright and serene, with a soft glow from the sun filtering through the trees.

**Thank you for your
attention**