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Route based forecasting

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http://research.meteogroup.com

Route based forecasting

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- Why route based forecasting?
- Requirements
- Example forecast
- Current developments!

Why route based forecasting?

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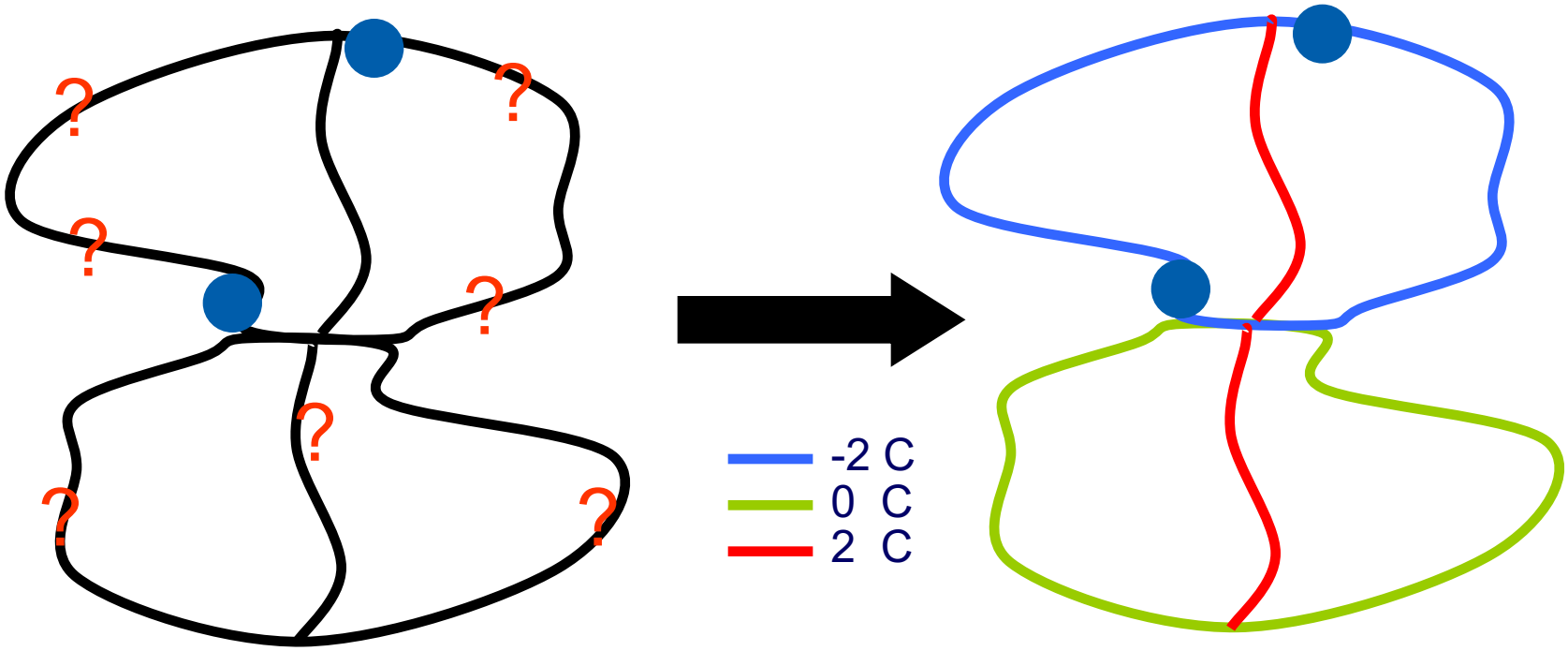
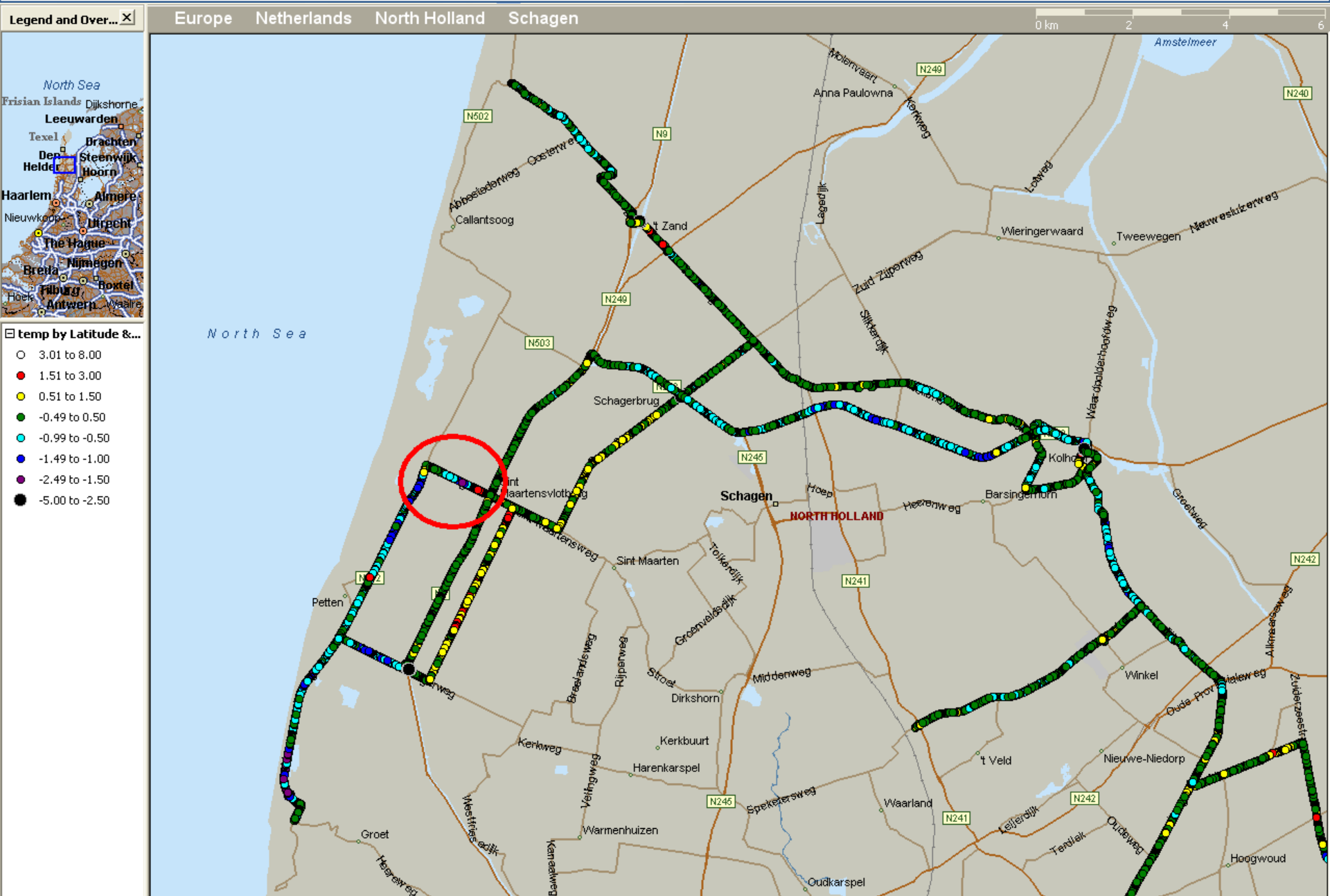
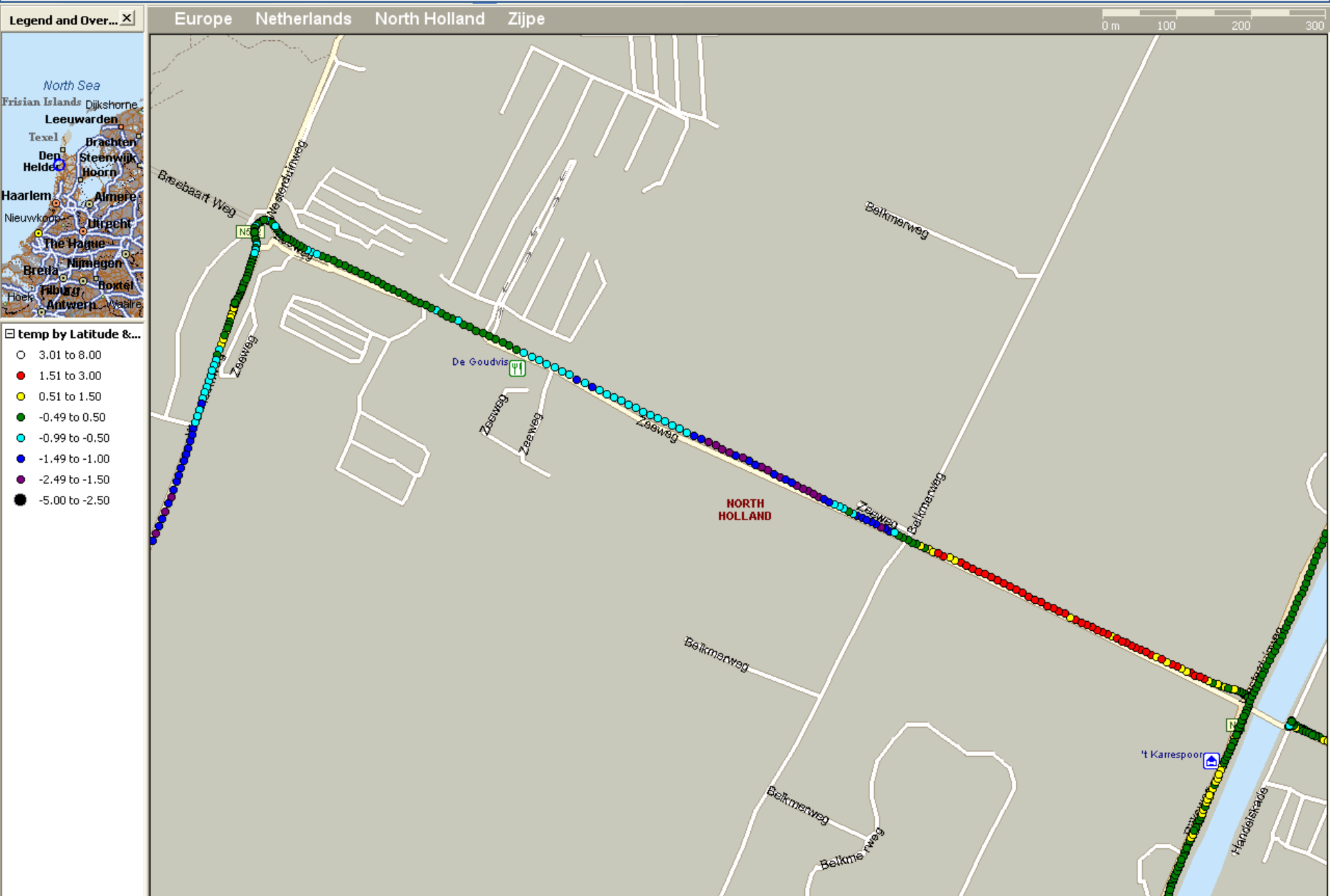
Route based forecast instead of point forecast



Infrared measurement



Infrared measurement



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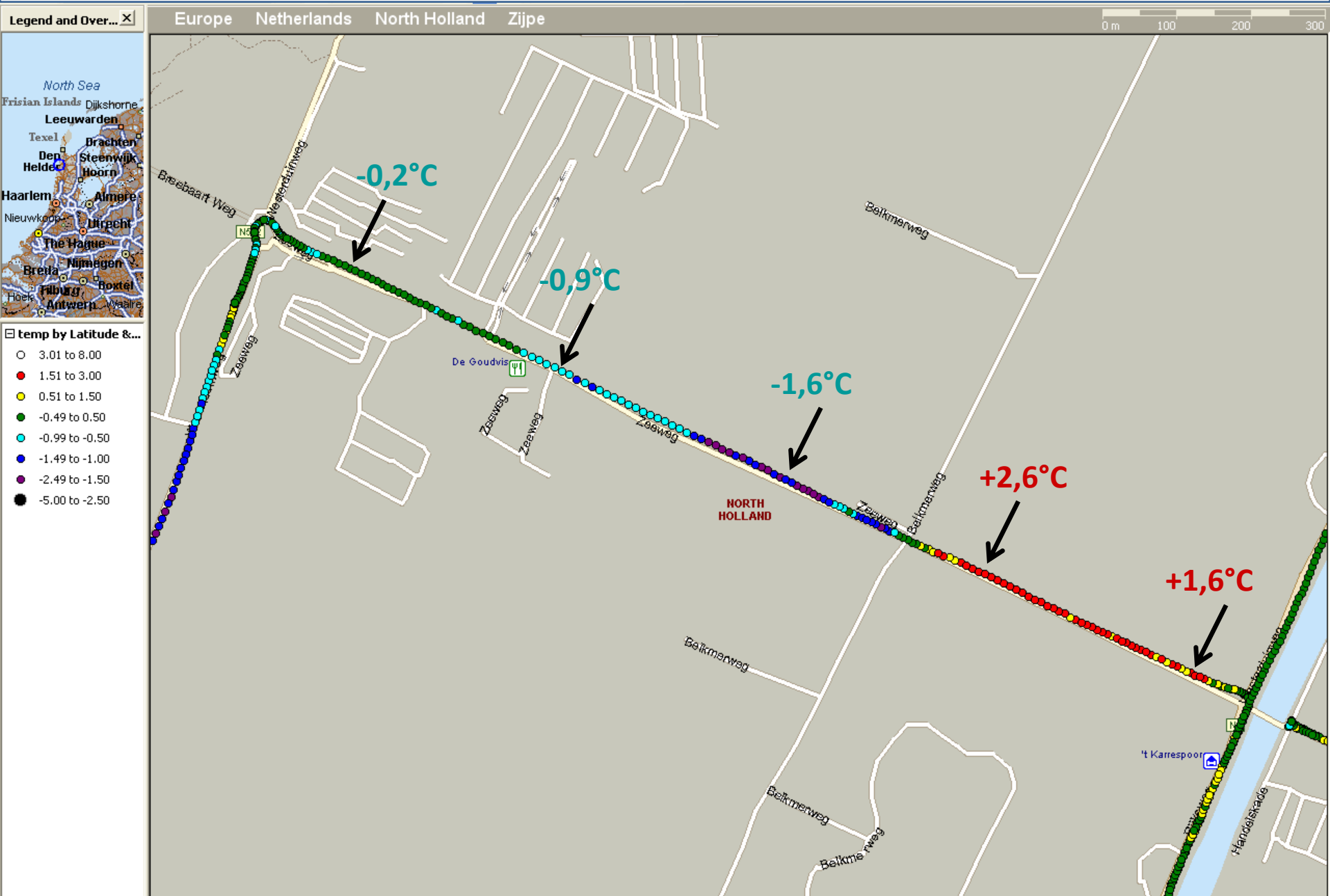
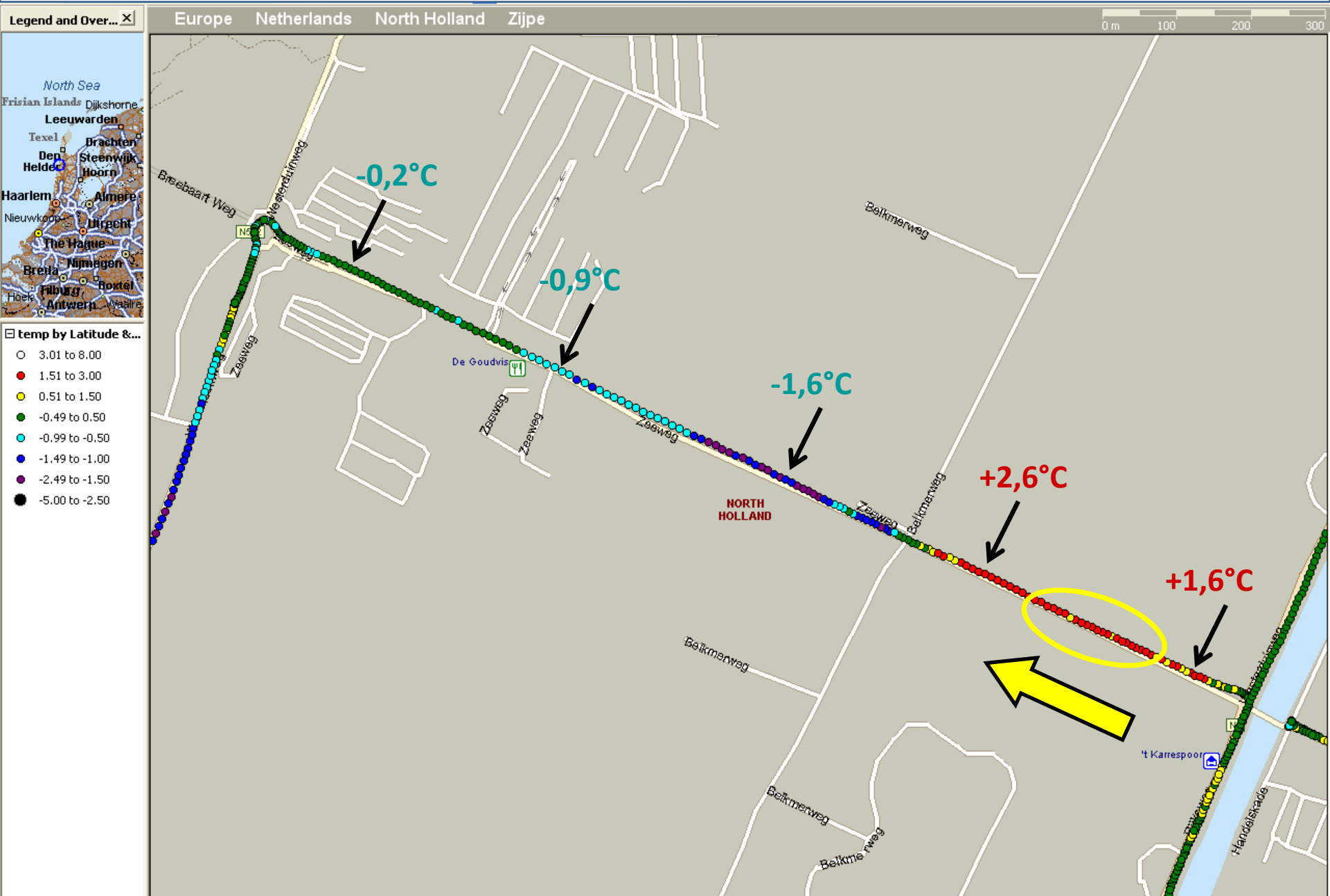


Infrared measurement



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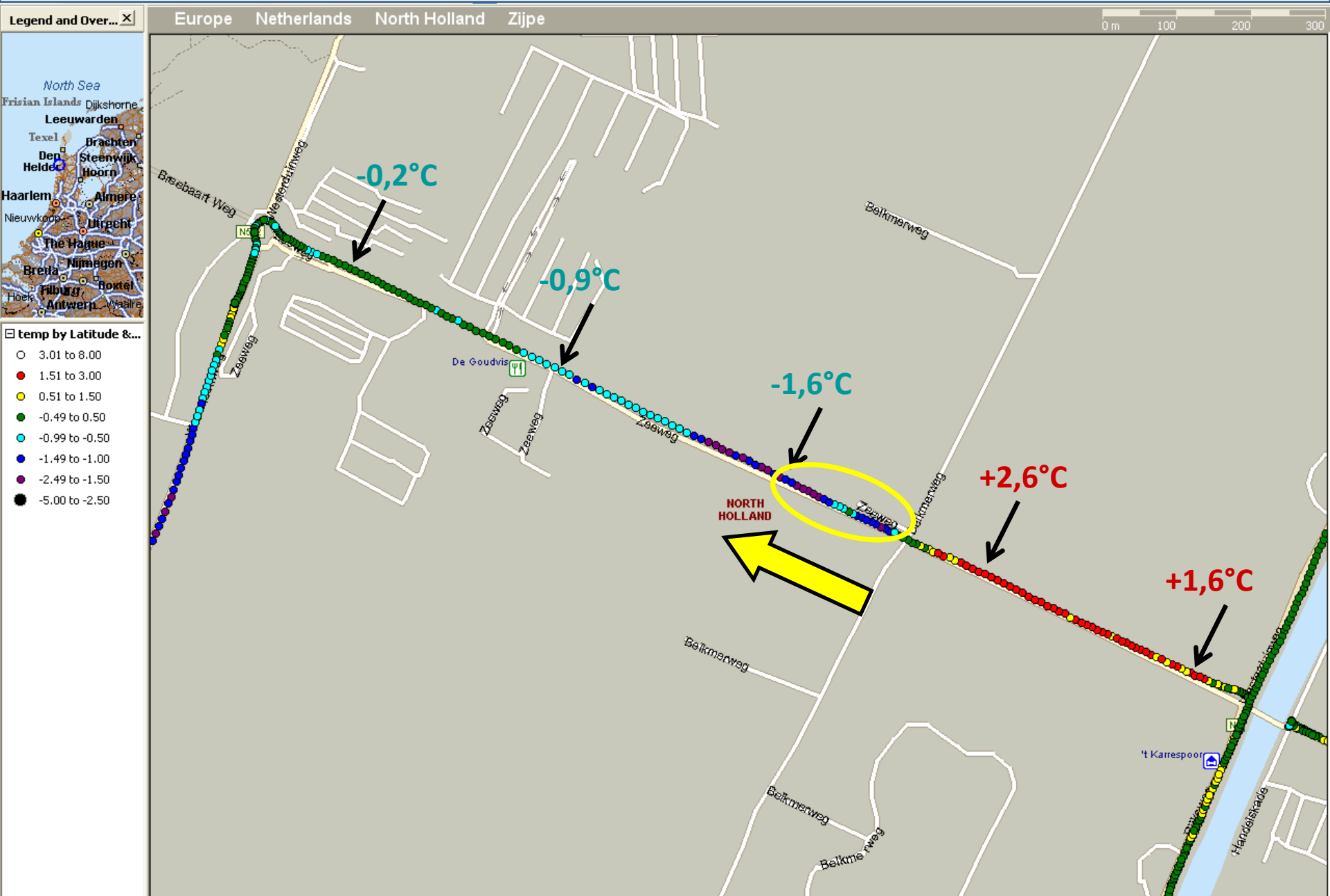
Infrared measurement



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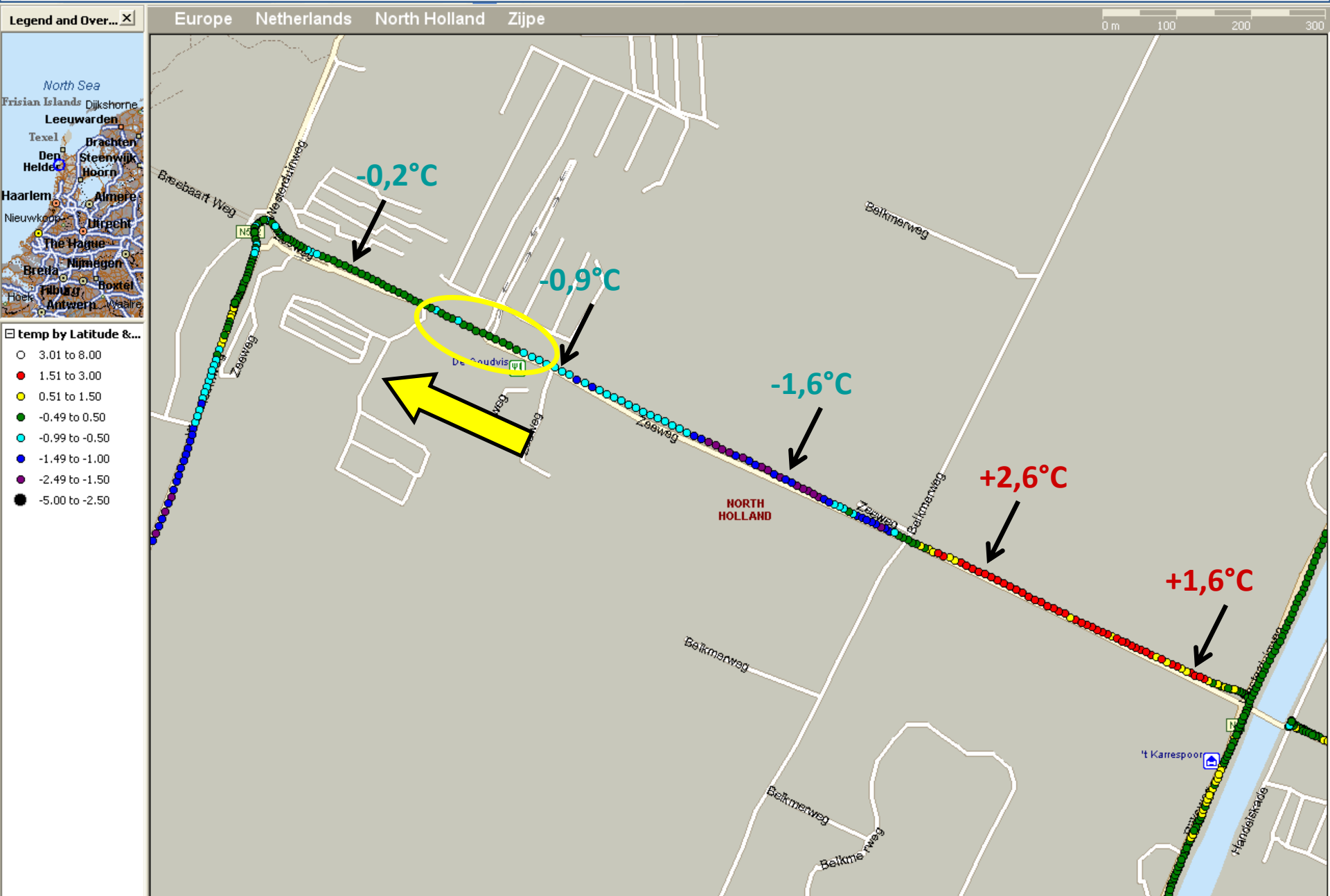
Infrared measurement



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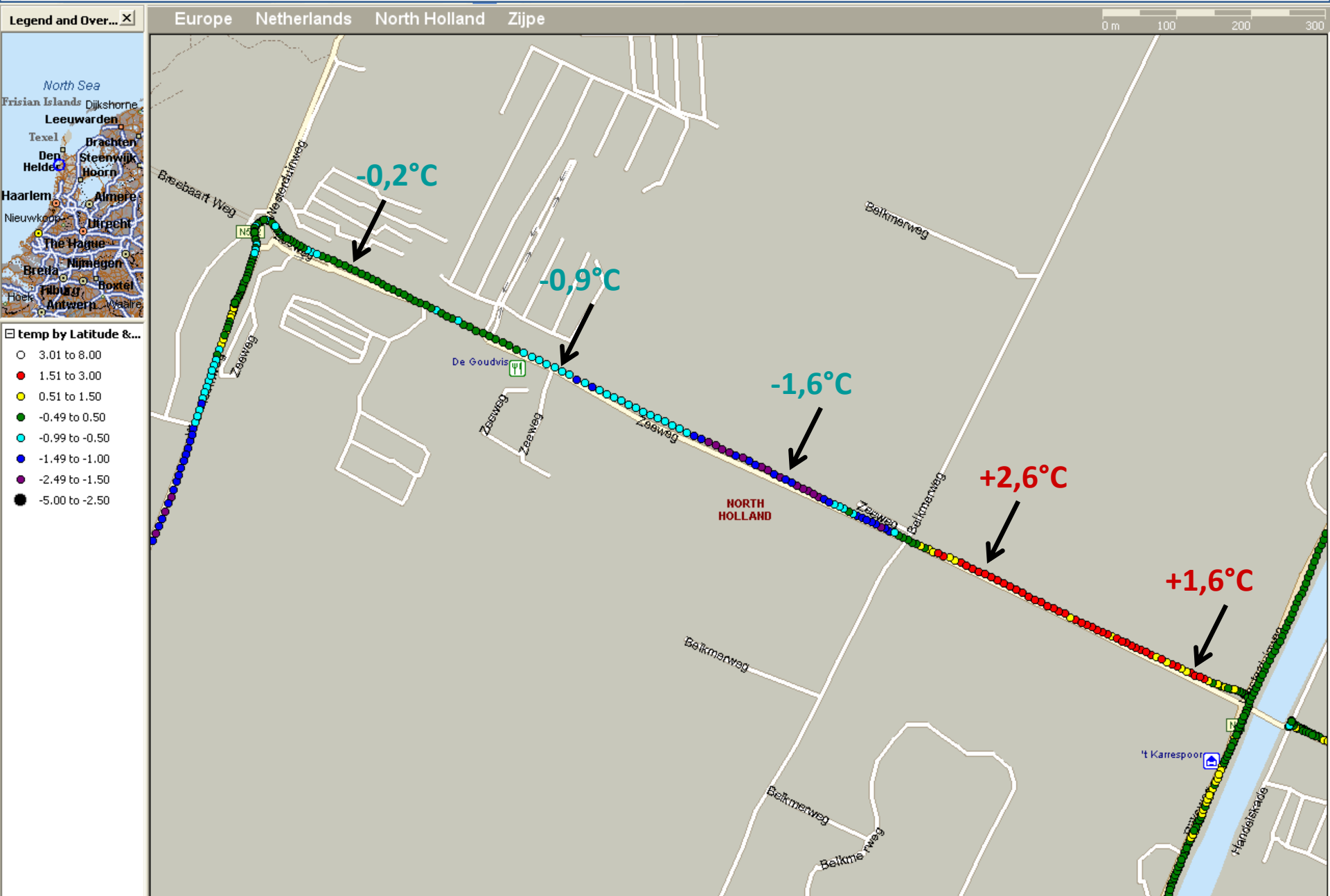
Infrared measurement



Why route based forecasting?

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Gritting:

The entire road section is treated in the same way

Is this useful?

Reduction possible!

Why route based forecasting??

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Infrared measurement

=

observation

Why route based forecasting?

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Infrared measurement

=

observation

Expected infrared measurement

=

Route based forecast

Requirements

- Information about incoming and outgoing radiation
  - Skyview measurements

Requirements

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Skyview

Requirements

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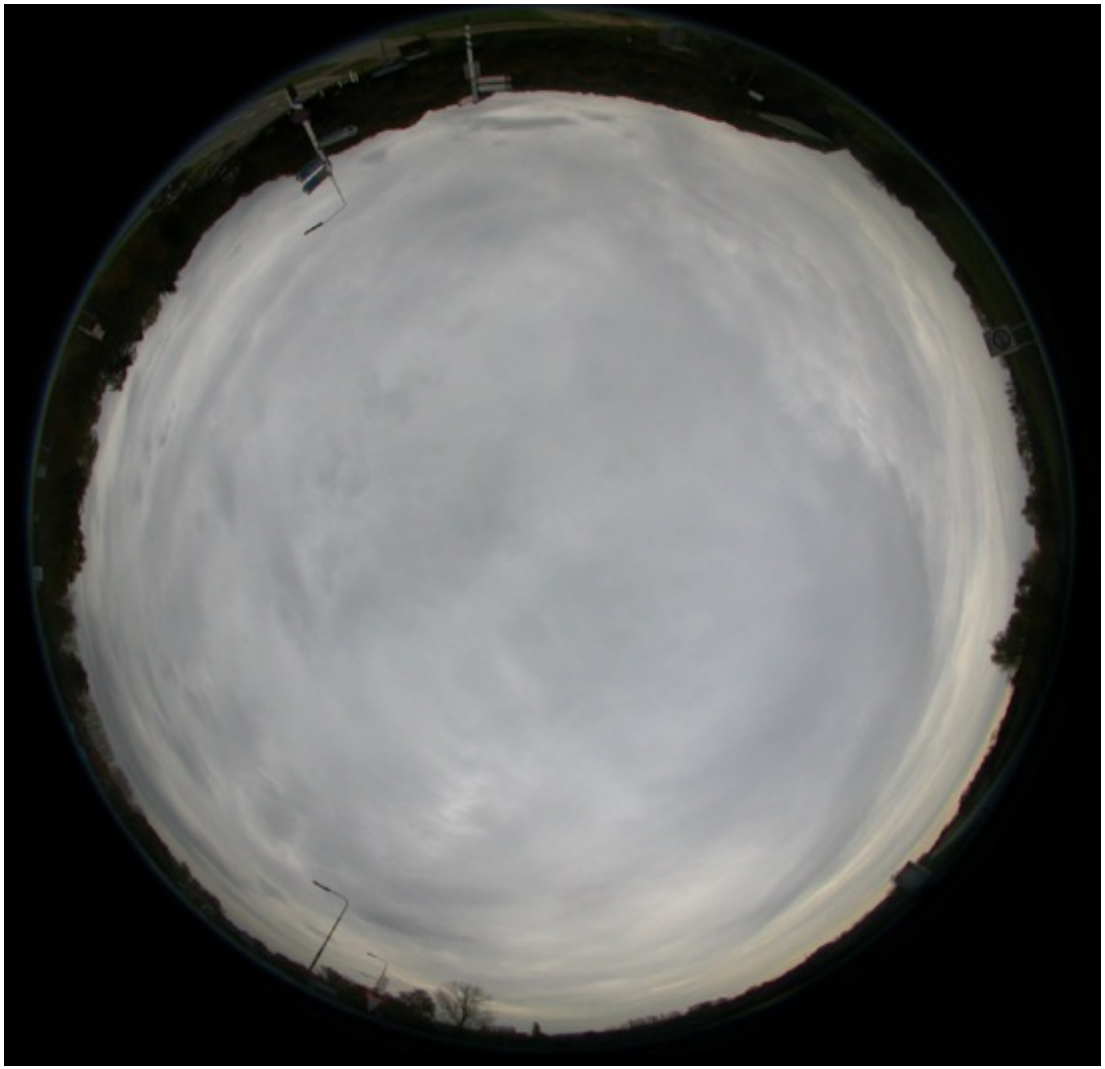
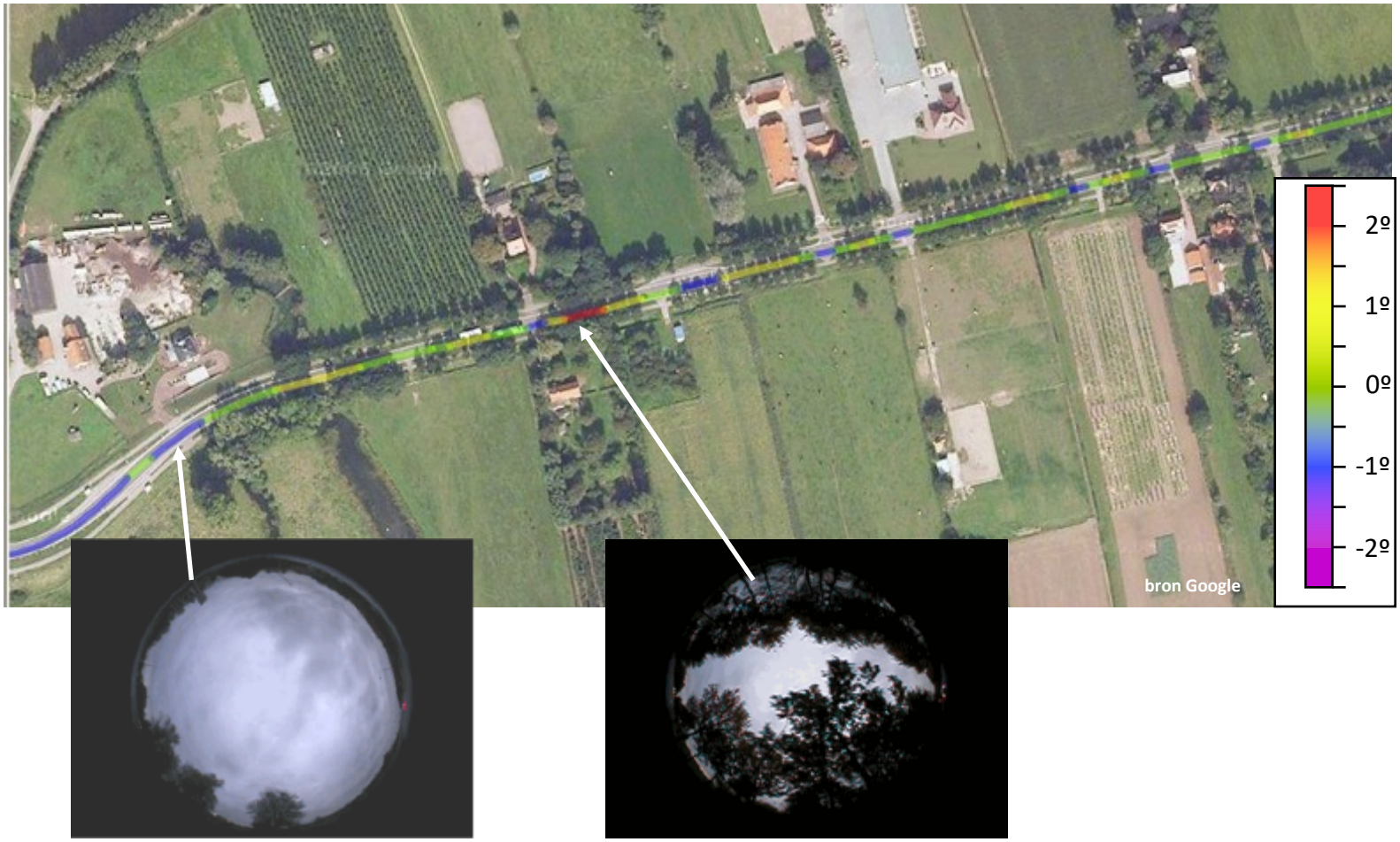
Skyview



Requirements

Skyview



Sky view factor = 0.89

Sky view factor = 0.36

Requirements

- Information about incoming and outgoing radiation
  - Skyview measurements
  - Solar view

Requirements

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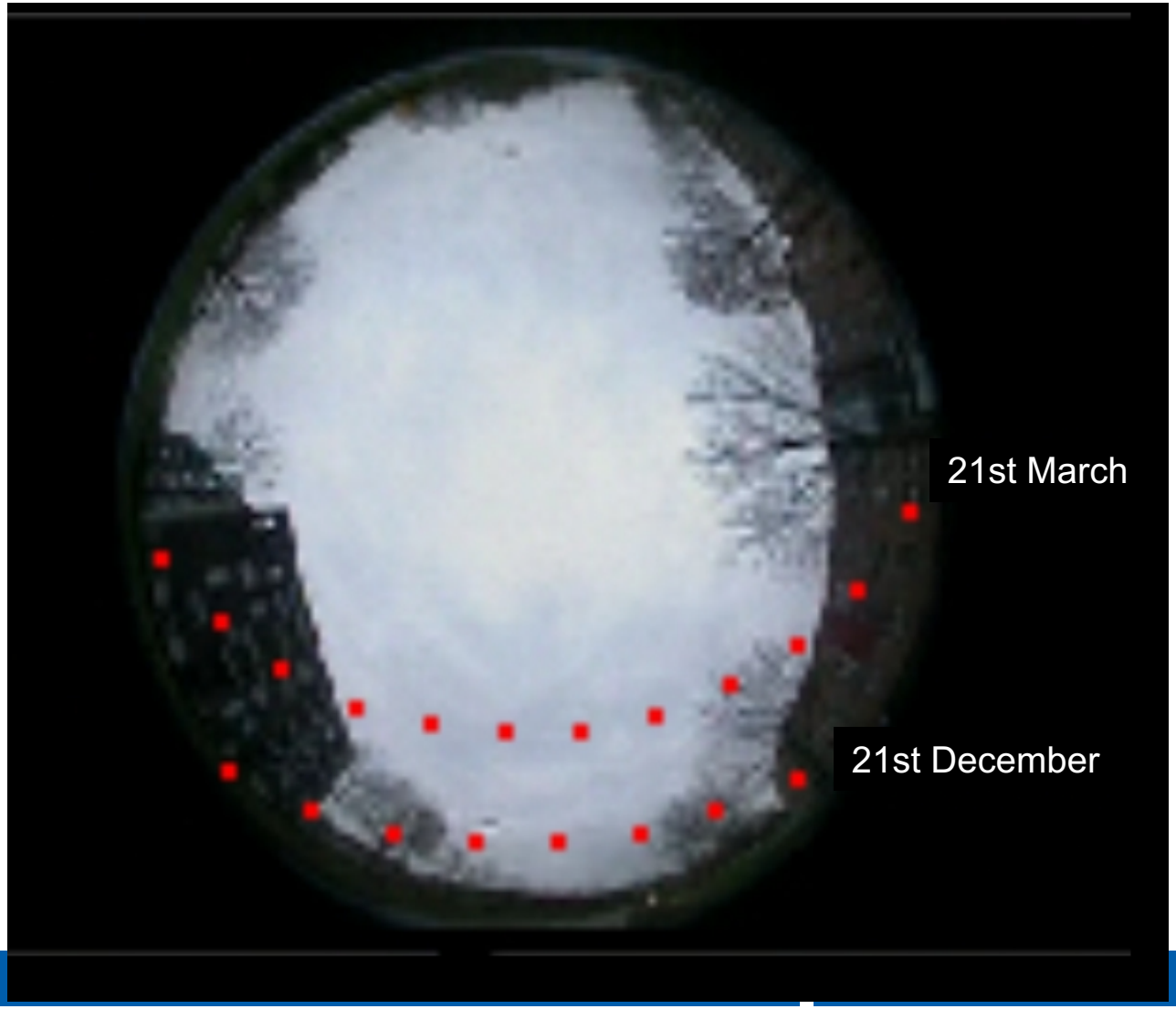
Solar view



Requirements

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What do we need?

- Information about incoming and outgoing radiation
  - ➢Skyview measurements
  - ➢Solar view
- Meteorological information
  - ➢Detailed weather forecast

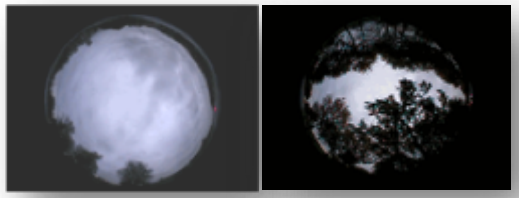
Requirements

Routbased forecast model

High resolution
weather forecast
(10 x10 km)
Gridded MOS

Model for calculating road surface temperatures

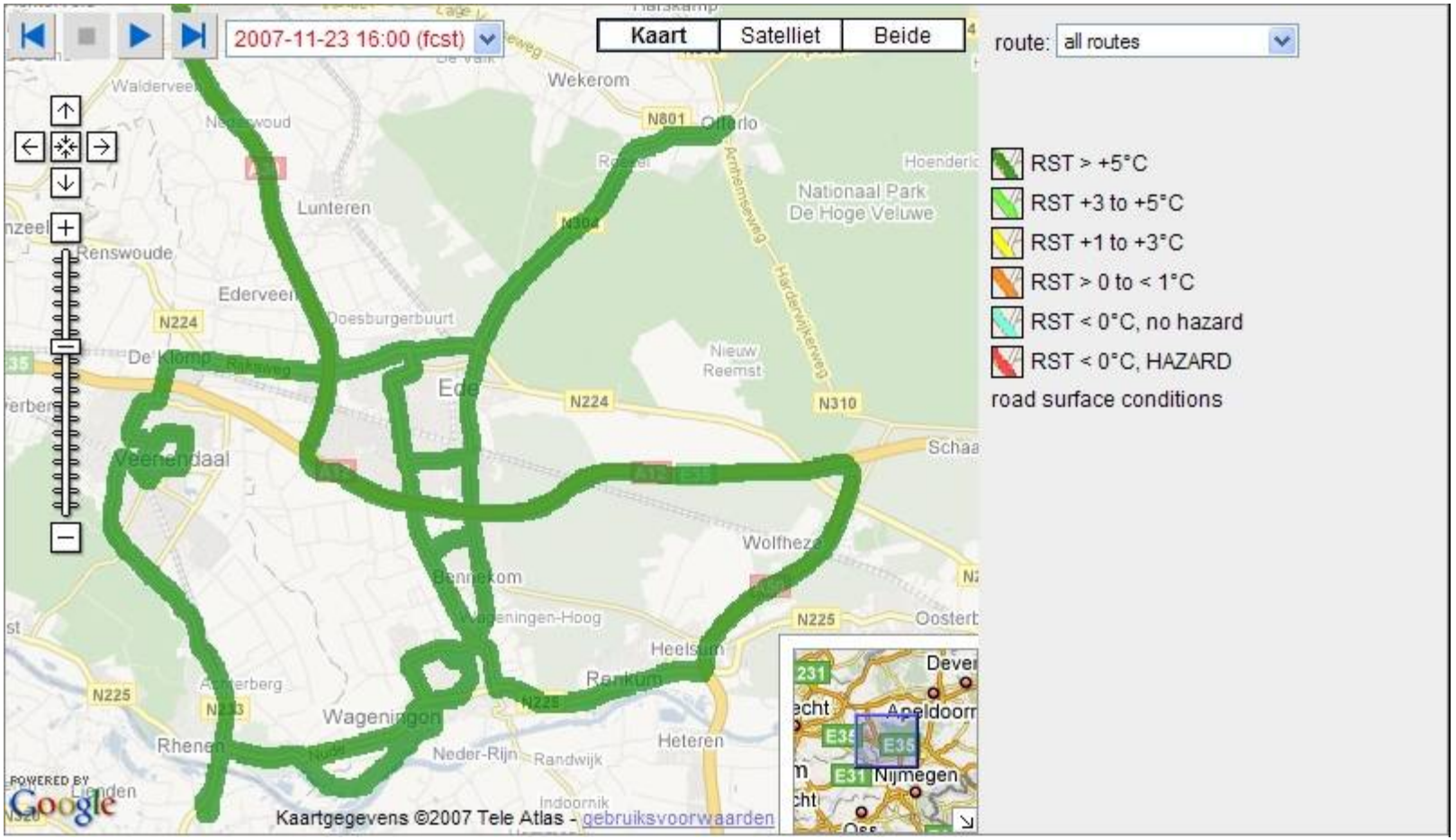
Route based forecast



Database with for all routes:
sky and *solar* view factor+
road characteristics

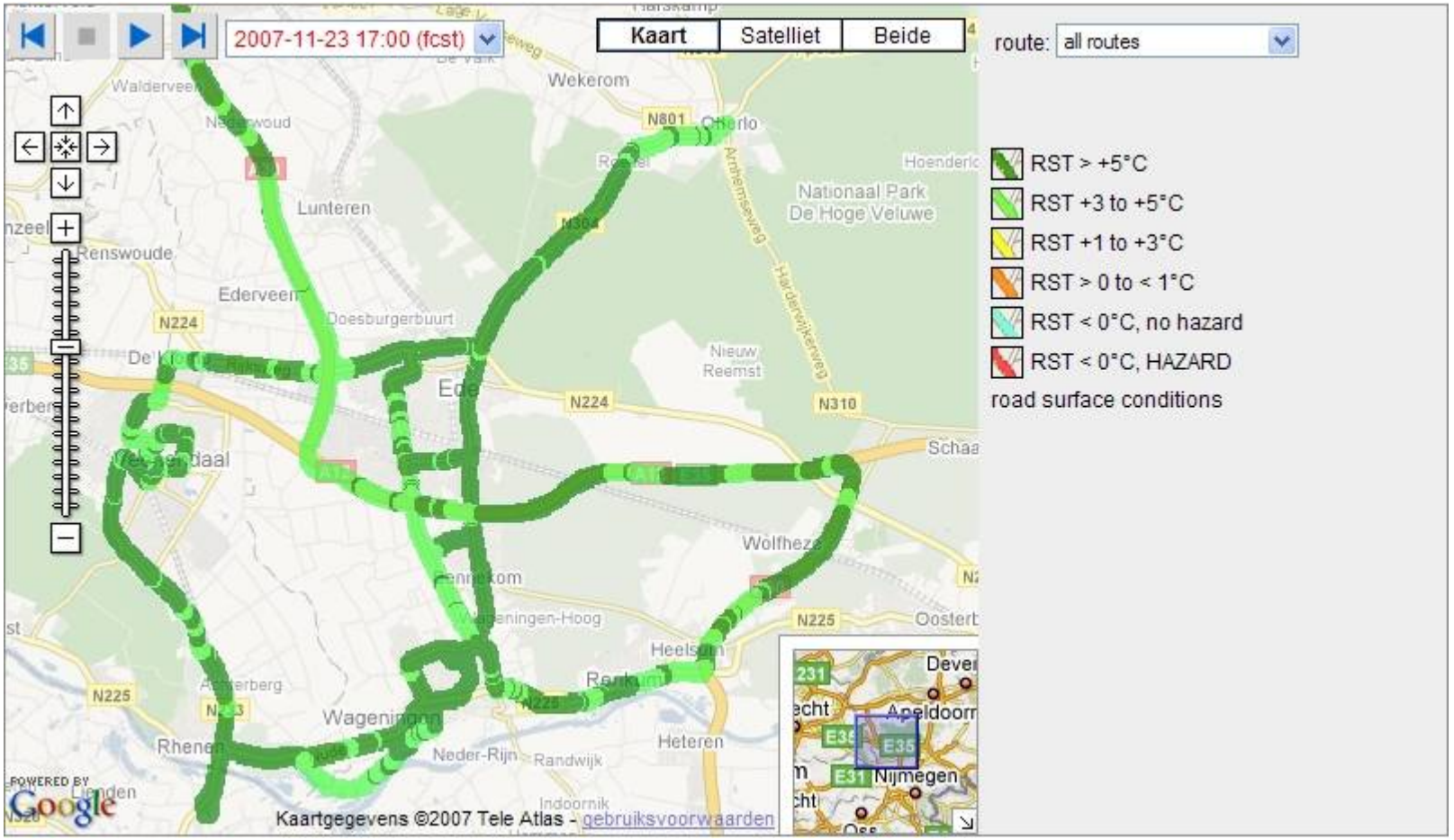
Example: 23/24 November 2007

16:00 h t=0 all roads warmer than 5 degrees



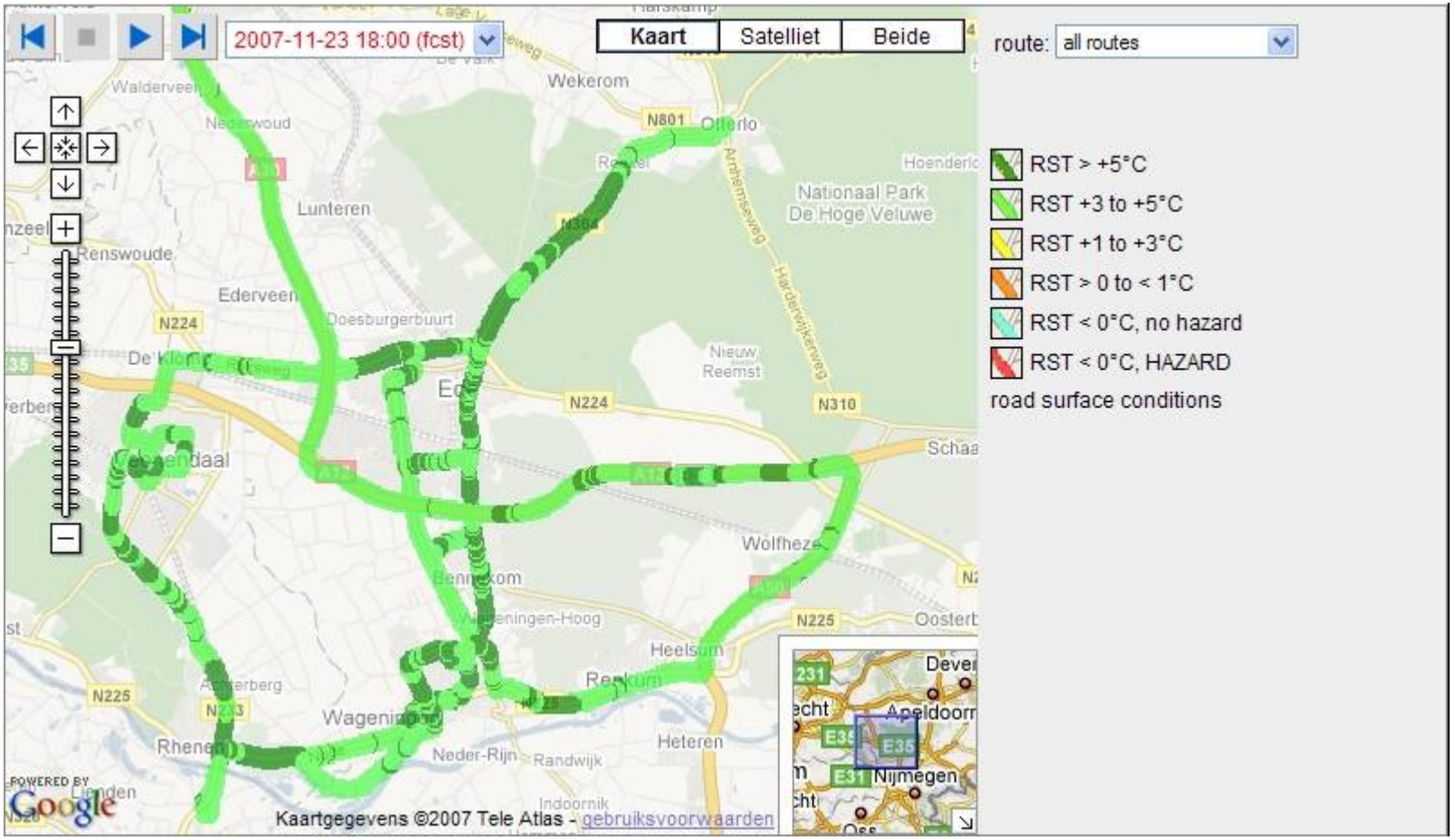
Example: 23/24 November 2007

17:00 h t+1 **first roads below 5 degrees**



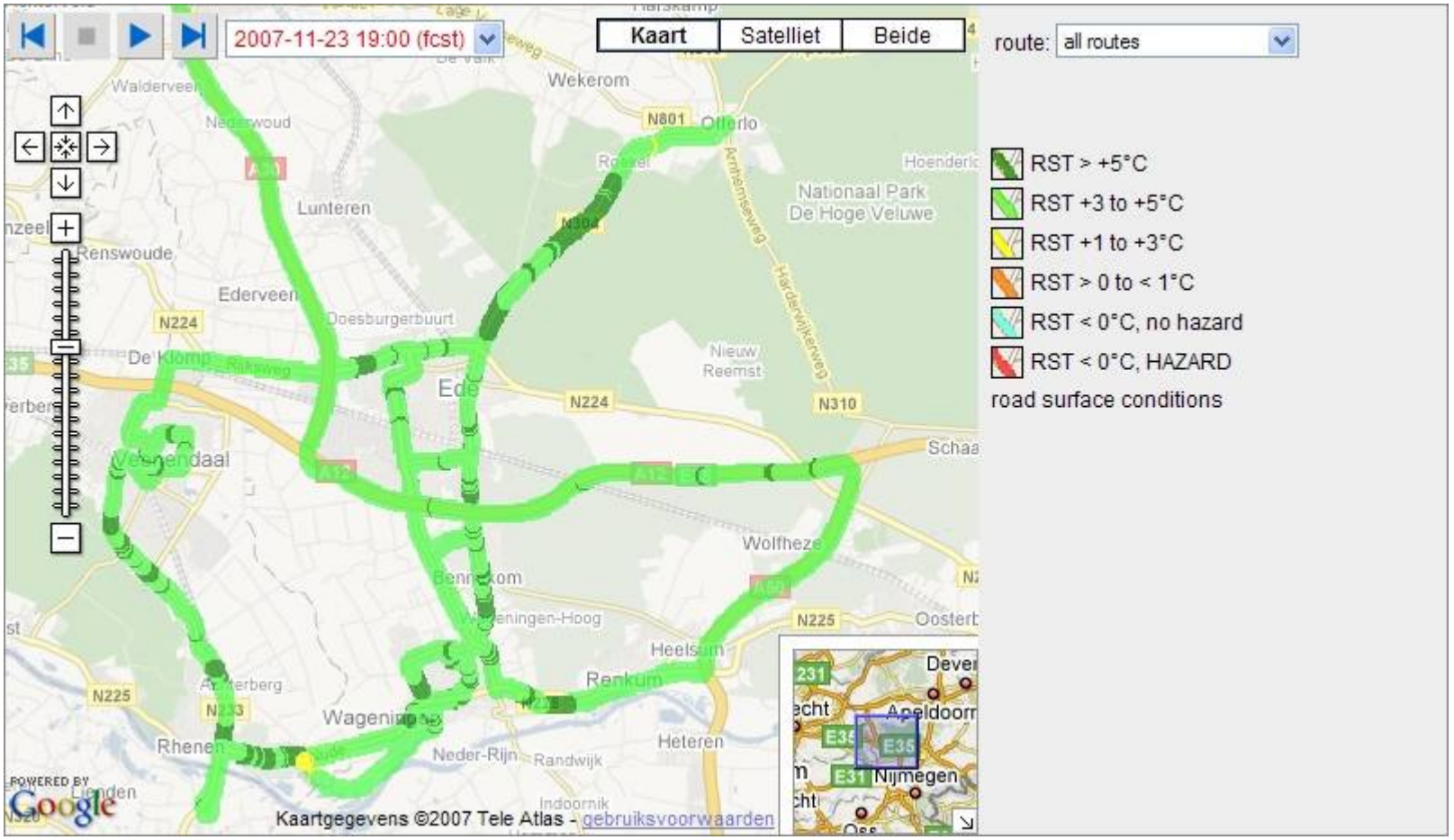
Example: 23/24 November 2007

18:00 h t+2



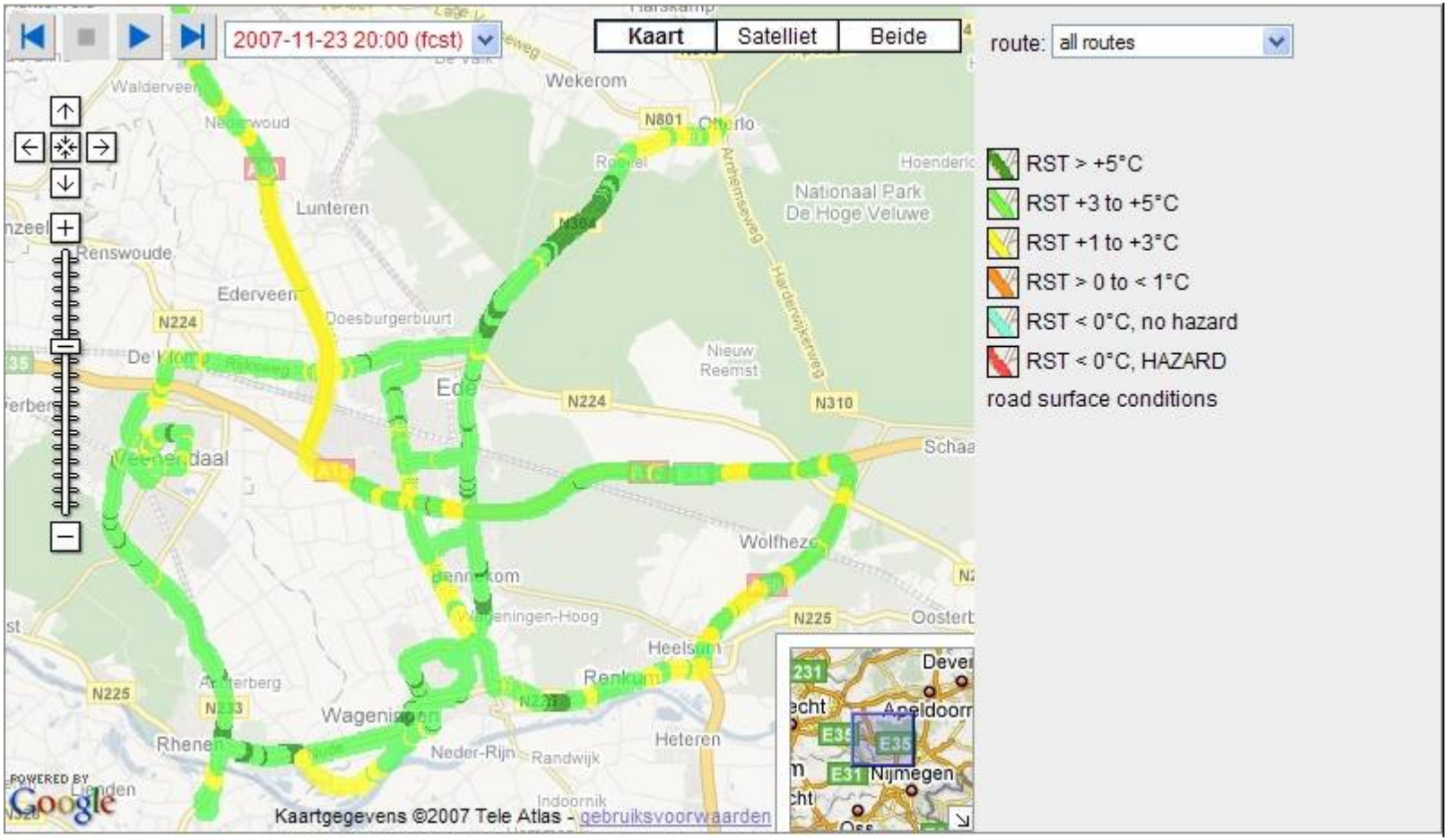
Example: 23/24 November 2007

19:00 h t+3 first roads below 3 degrees



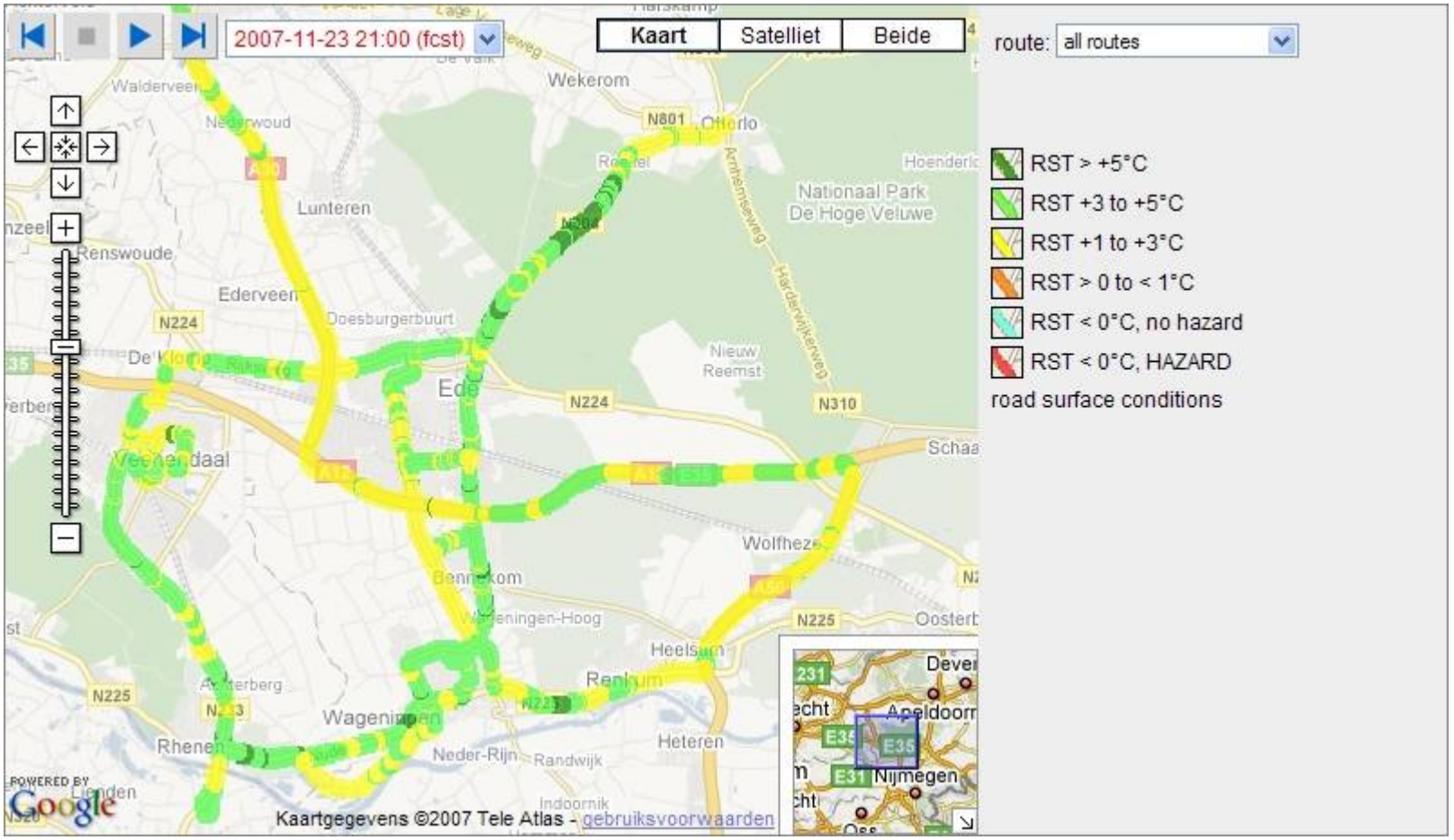
Example: 23/24 November 2007

20:00 h t+4 **more roads below 3 degrees**



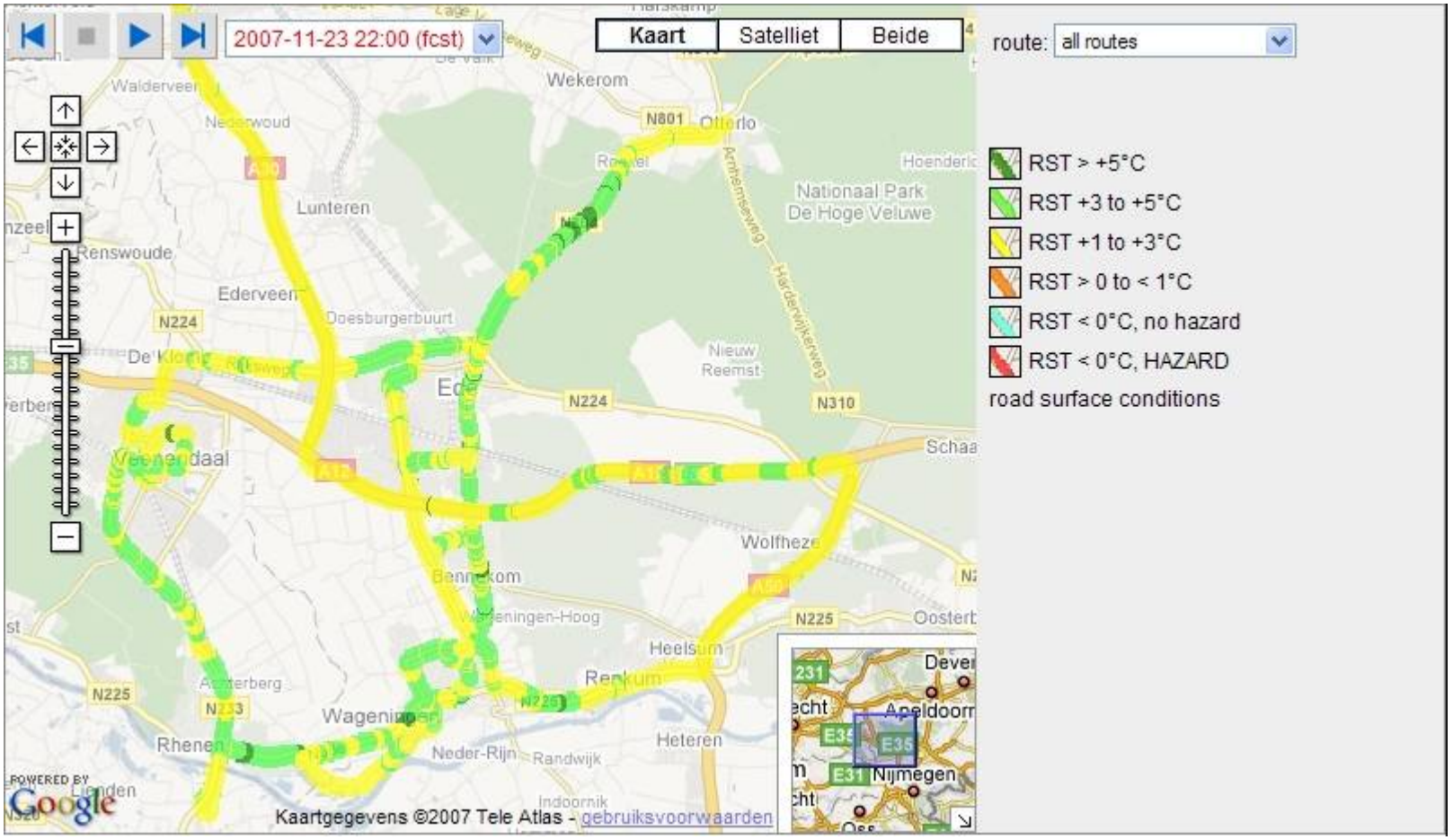
Example: 23/24 November 2007

21:00 h t+5 **more roads below 3 degrees**



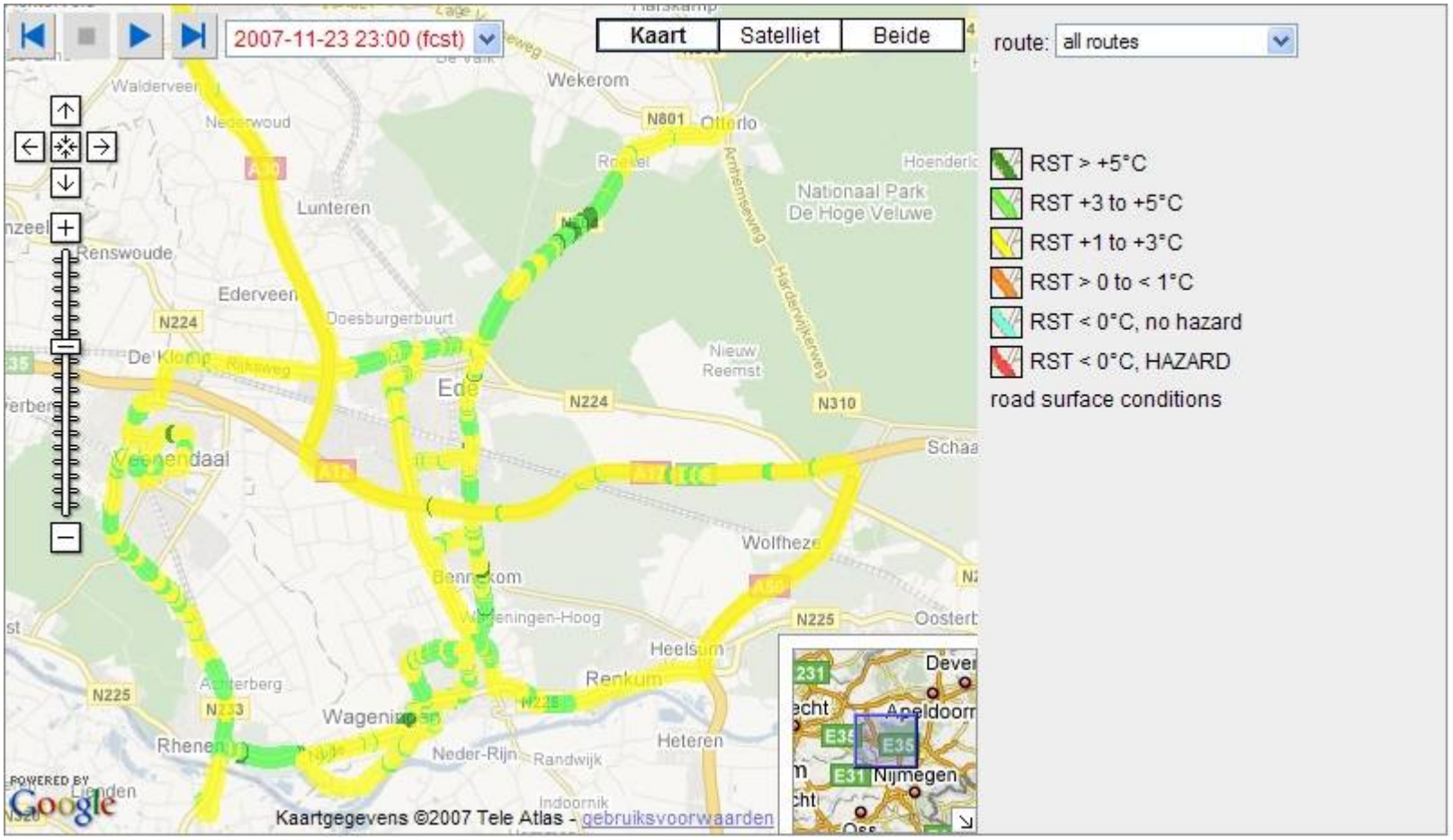
Example: 23/24 November 2007

22:00 h t+6



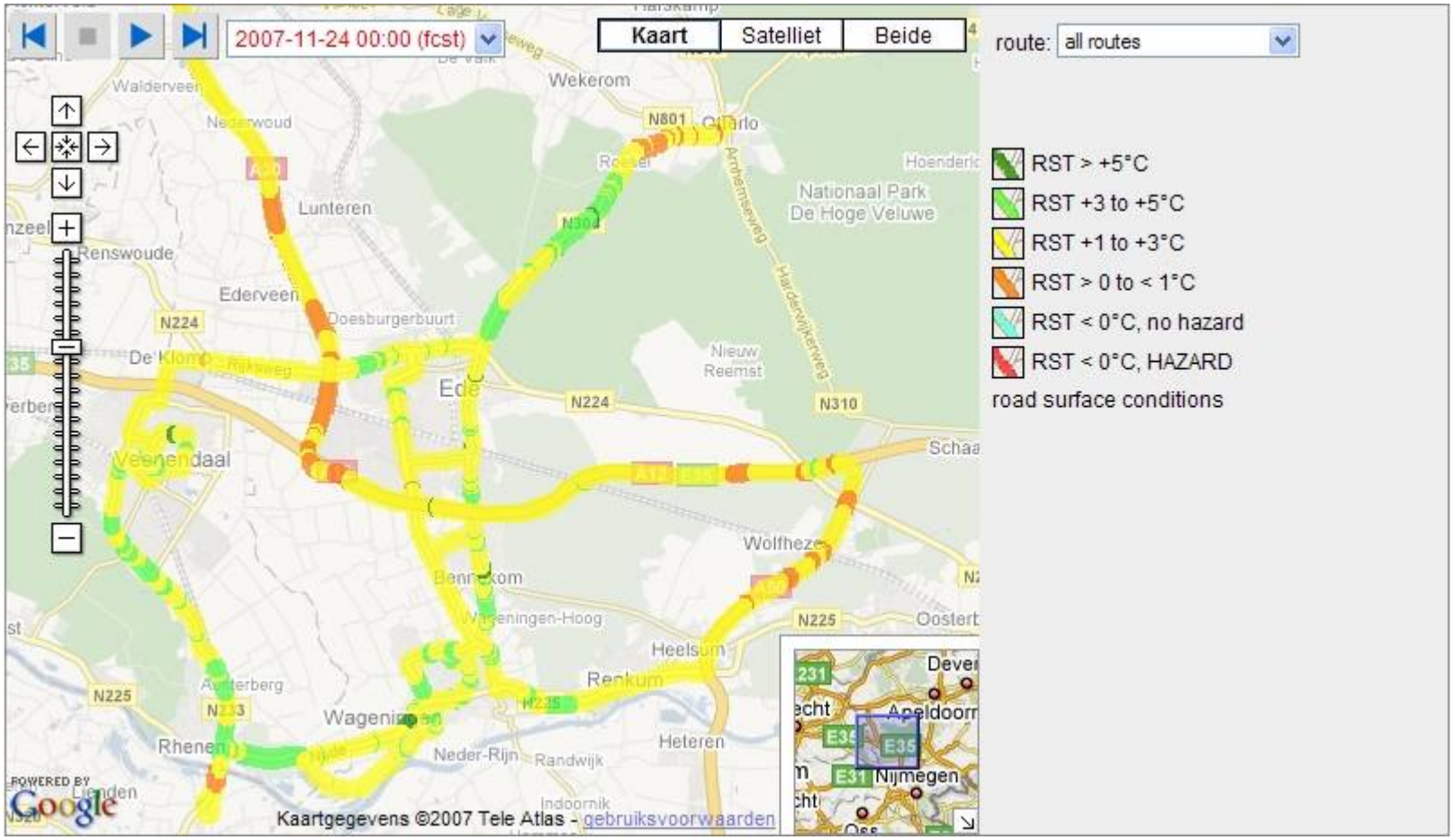
Example: 23/24 November 2007

23:00 h t+7



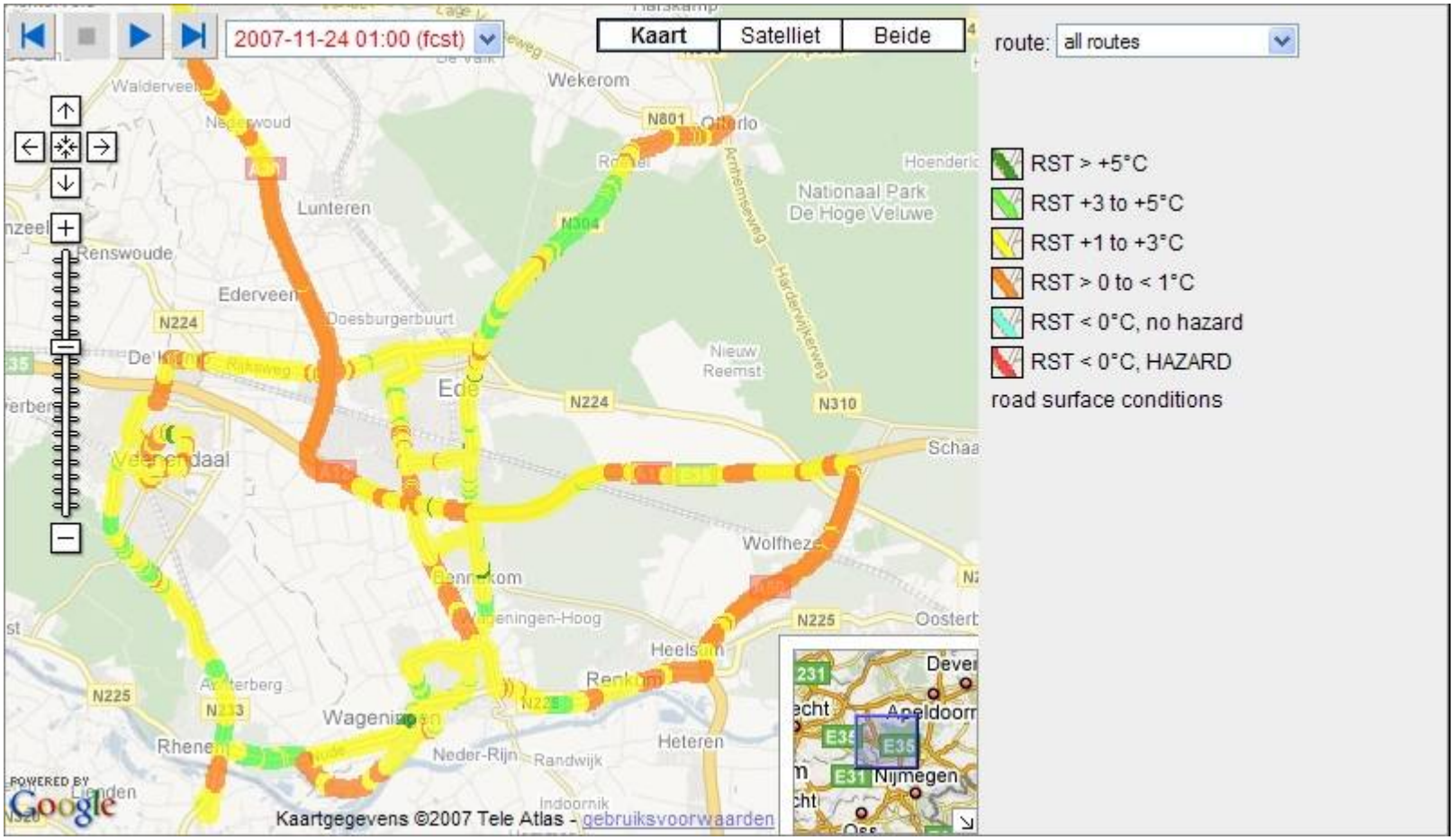
Example: 23/24 November 2007

00:00 h t+8 **first roads below 1 degree**



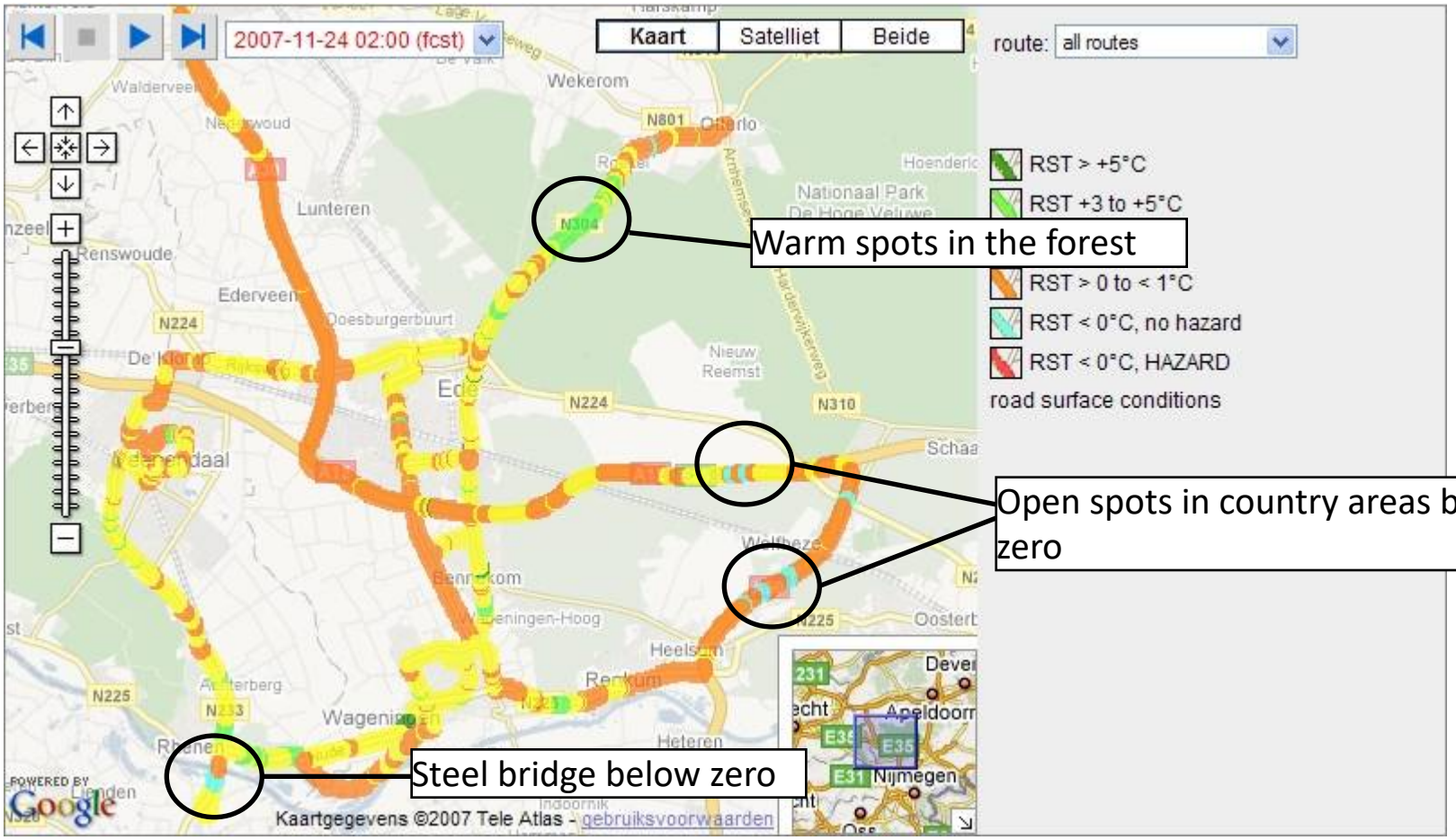
Example: 23/24 November 2007

01:00 h t+9



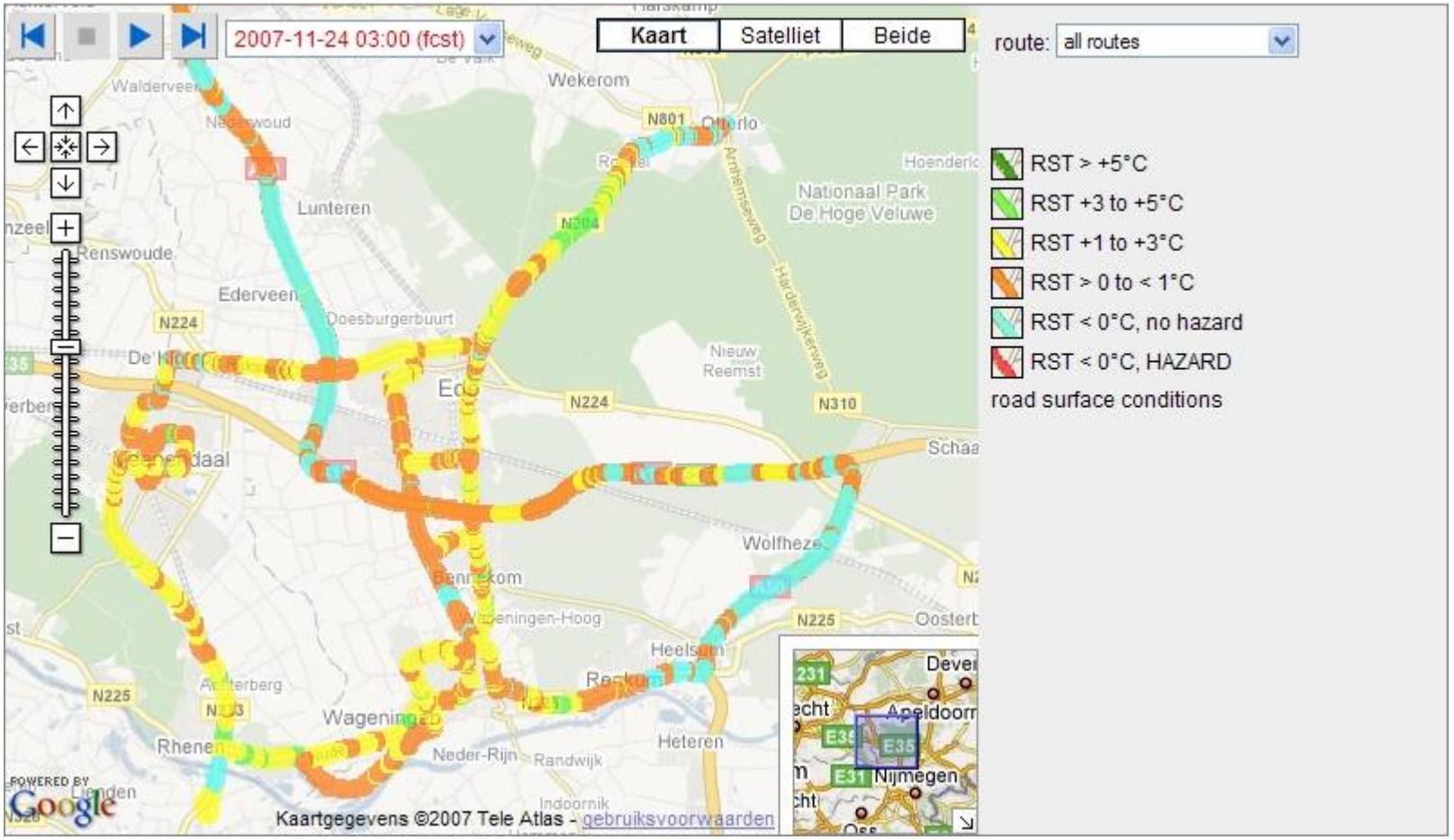
Example: 23/24 November 2007

02:00 h t+10 **more roads below 1 degree**



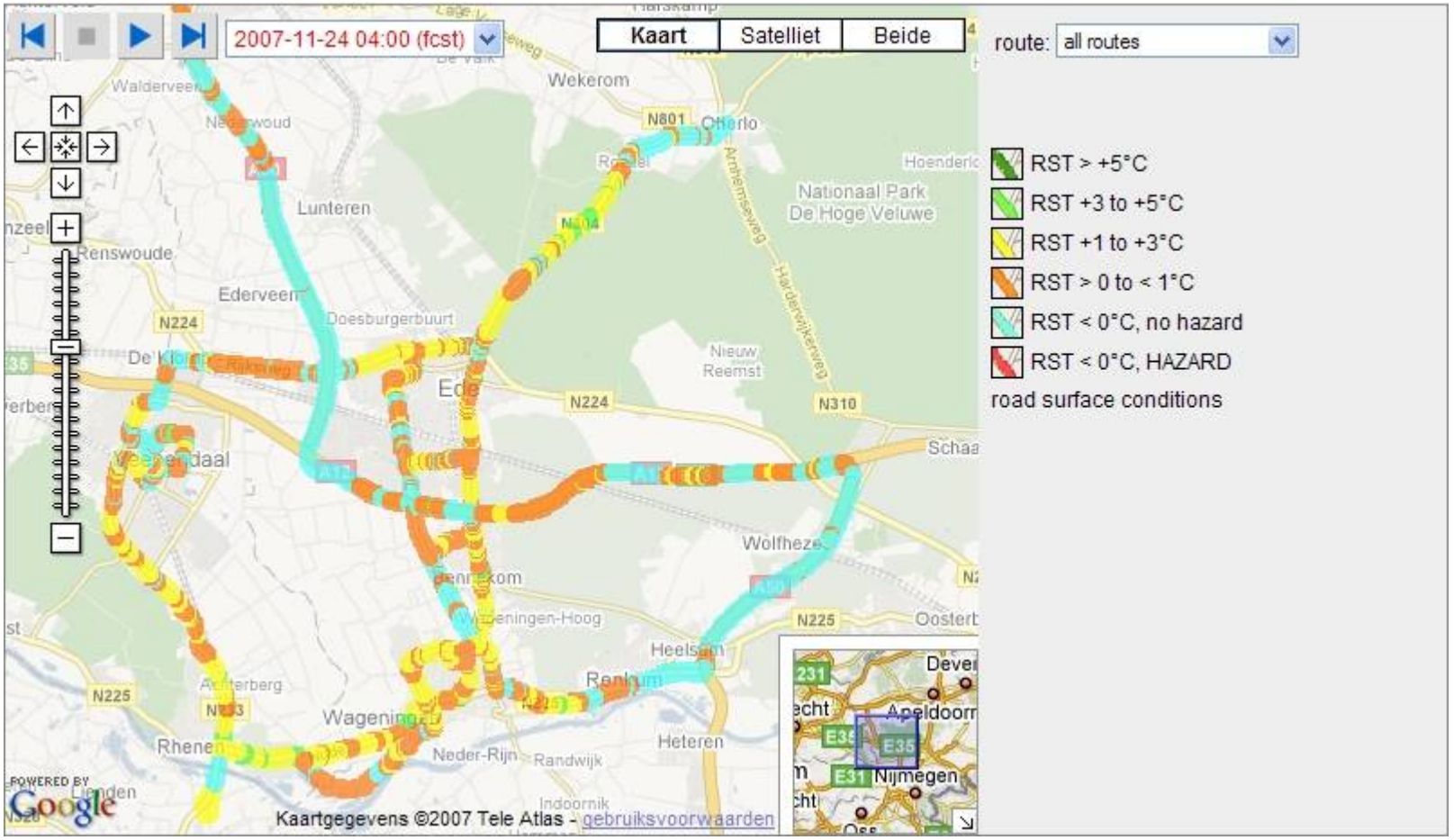
Example: 23/24 November 2007

03:00 h t+11



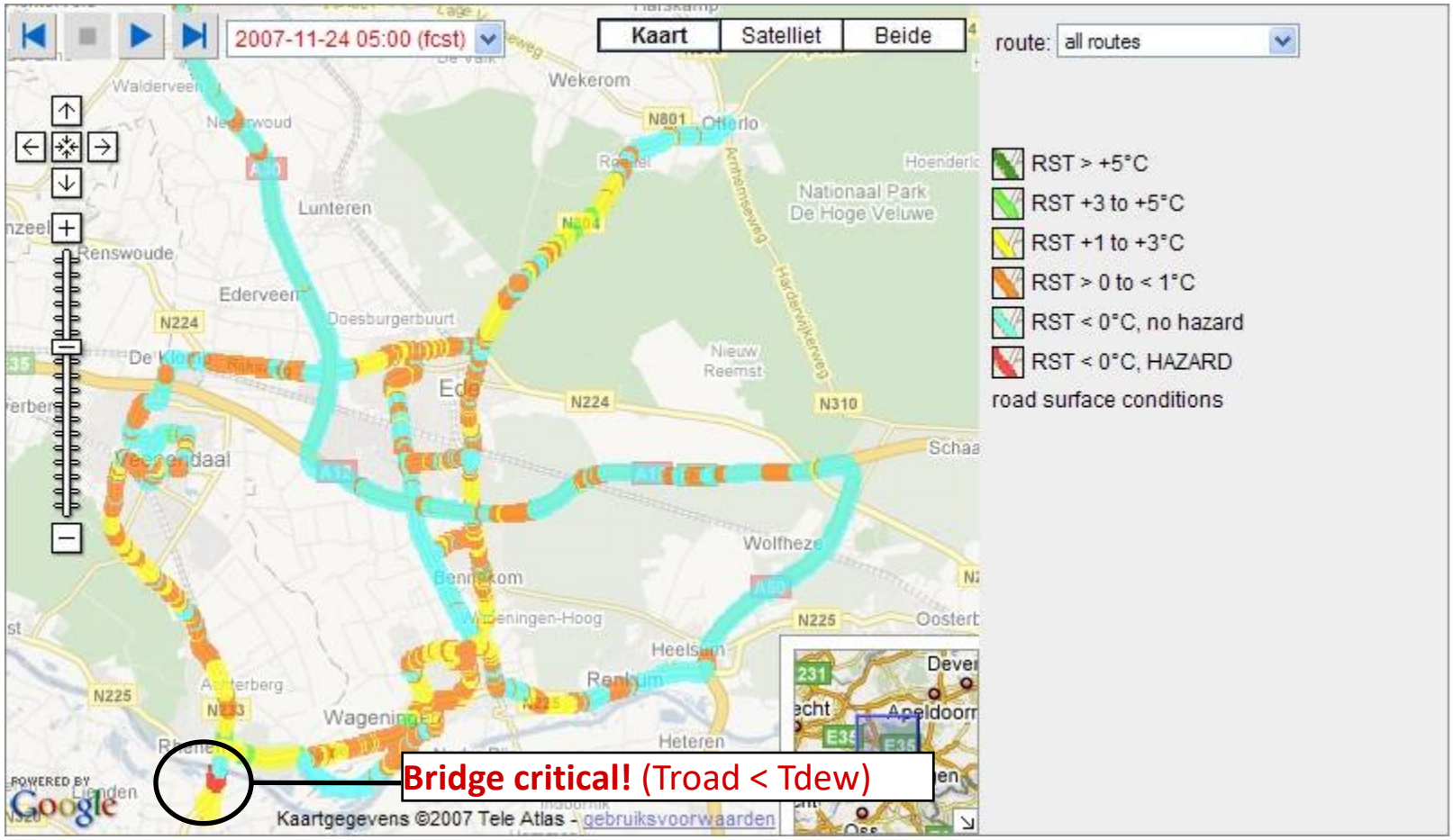
Example: 23/24 November 2007

04:00 h t+12



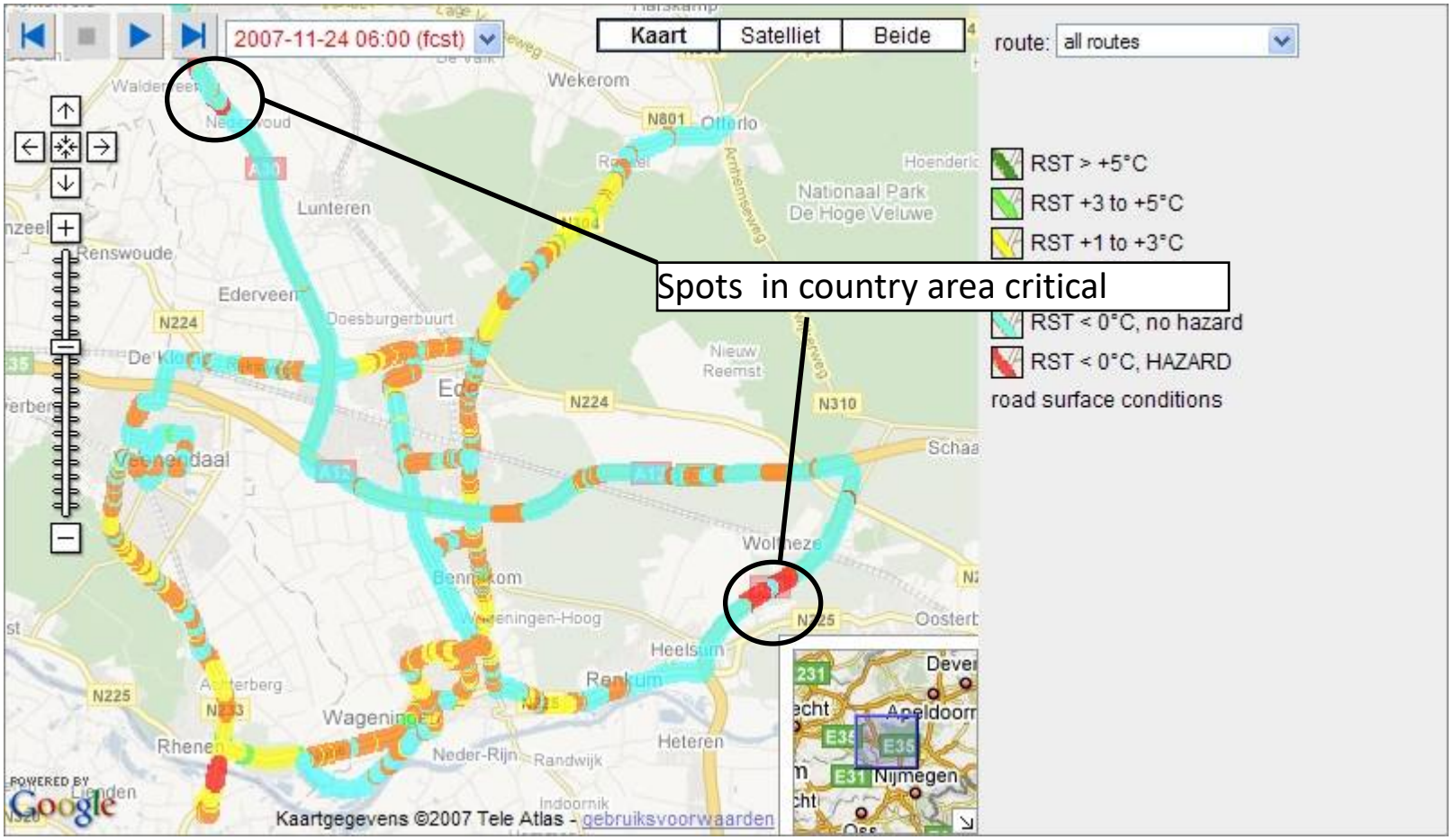
Example: 23/24 November 2007

05:00 h t+13



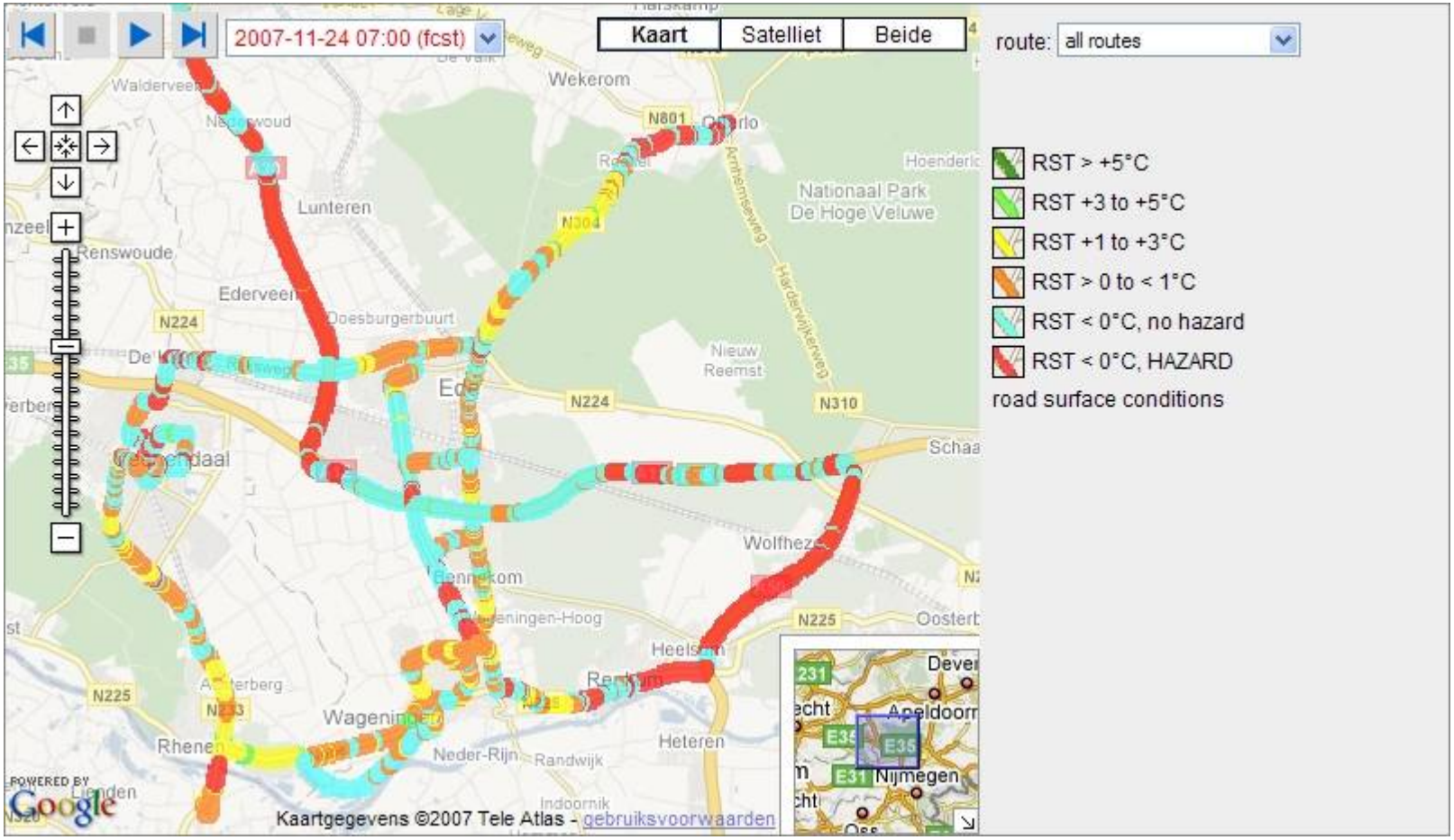
Example: 23/24 November 2007

06:00 h t+14



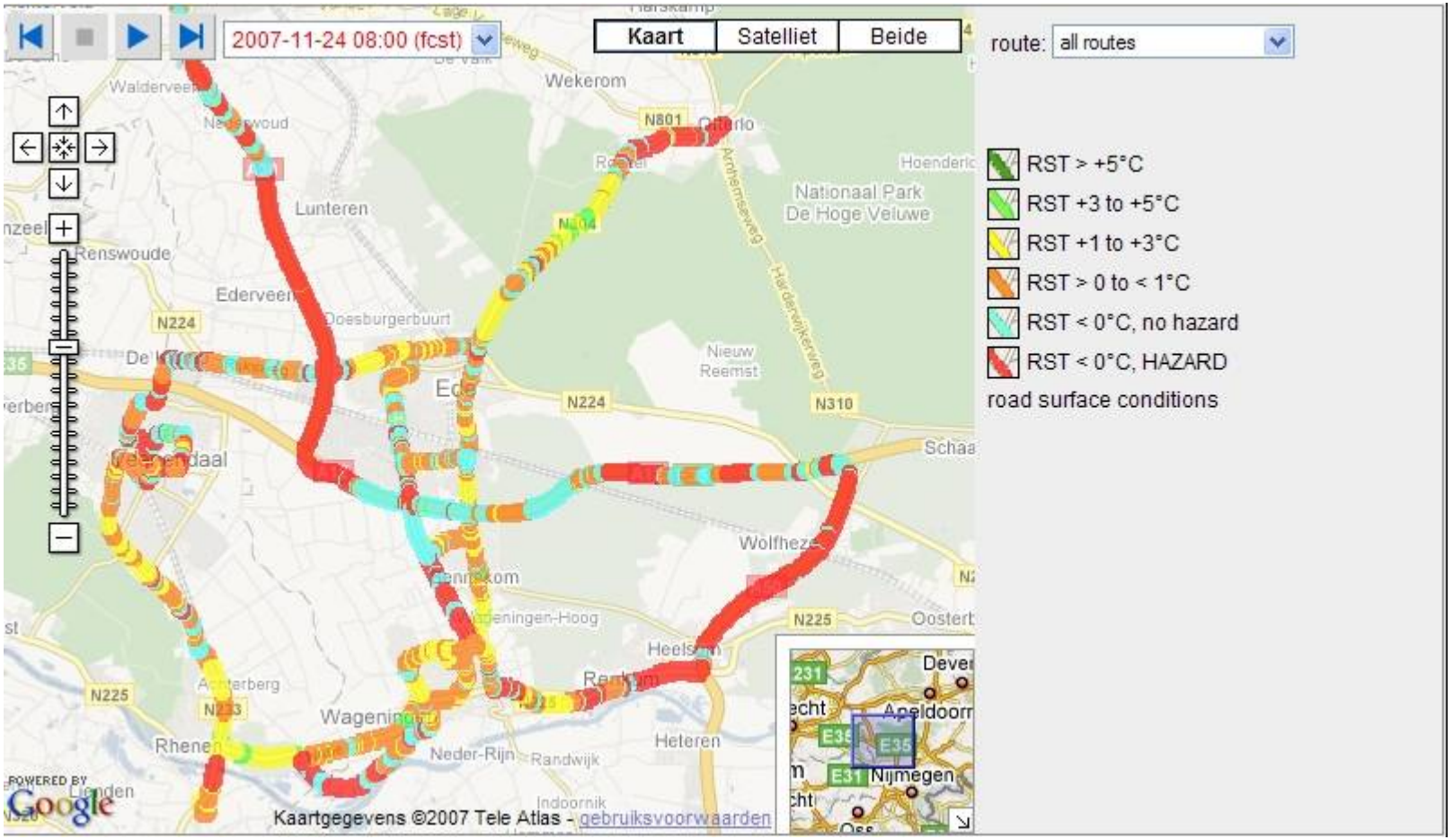
Example: 23/24 November 2007

07:00 h t+15



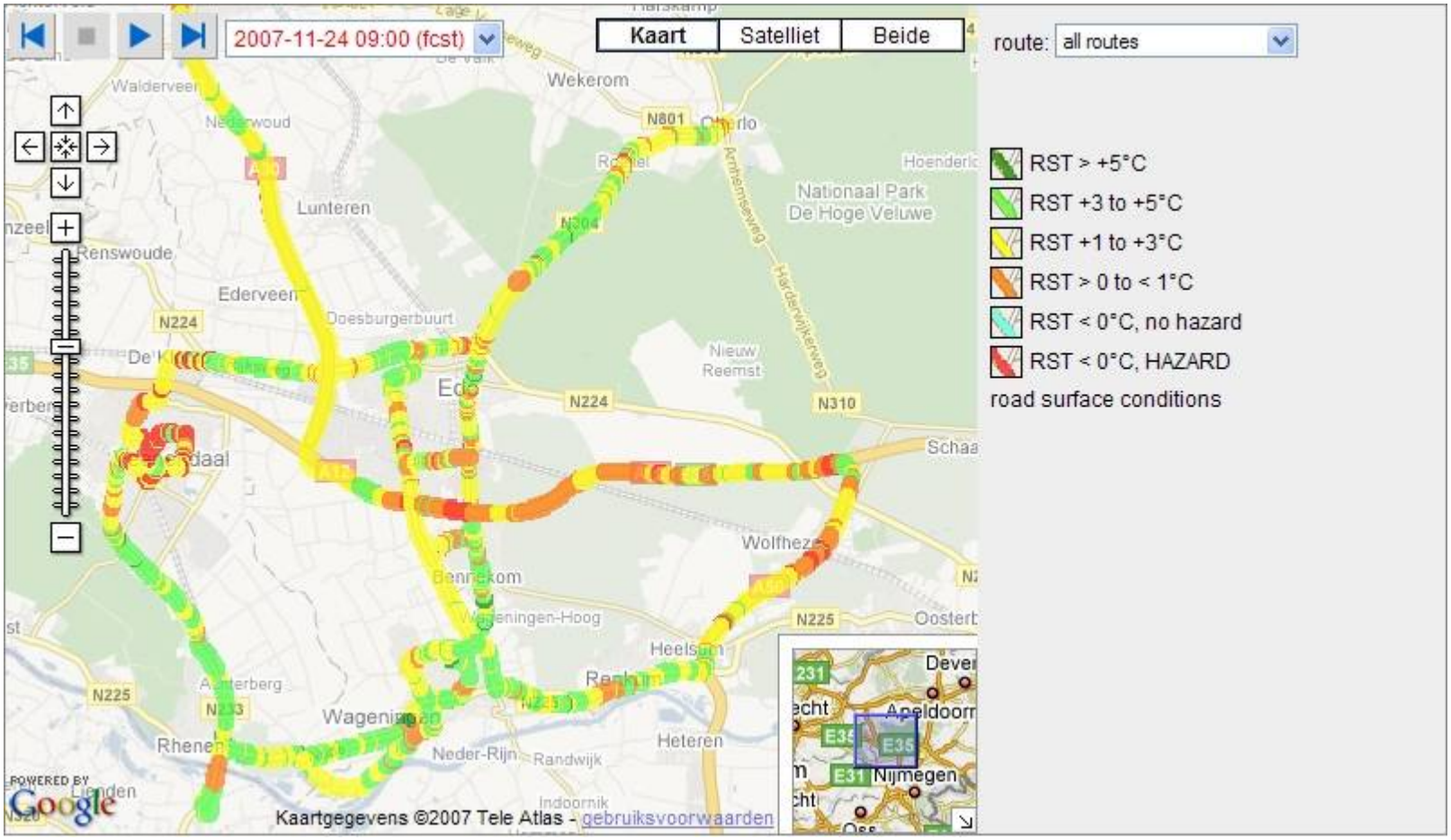
Example: 23/24 November 2007

08:00 h t+16



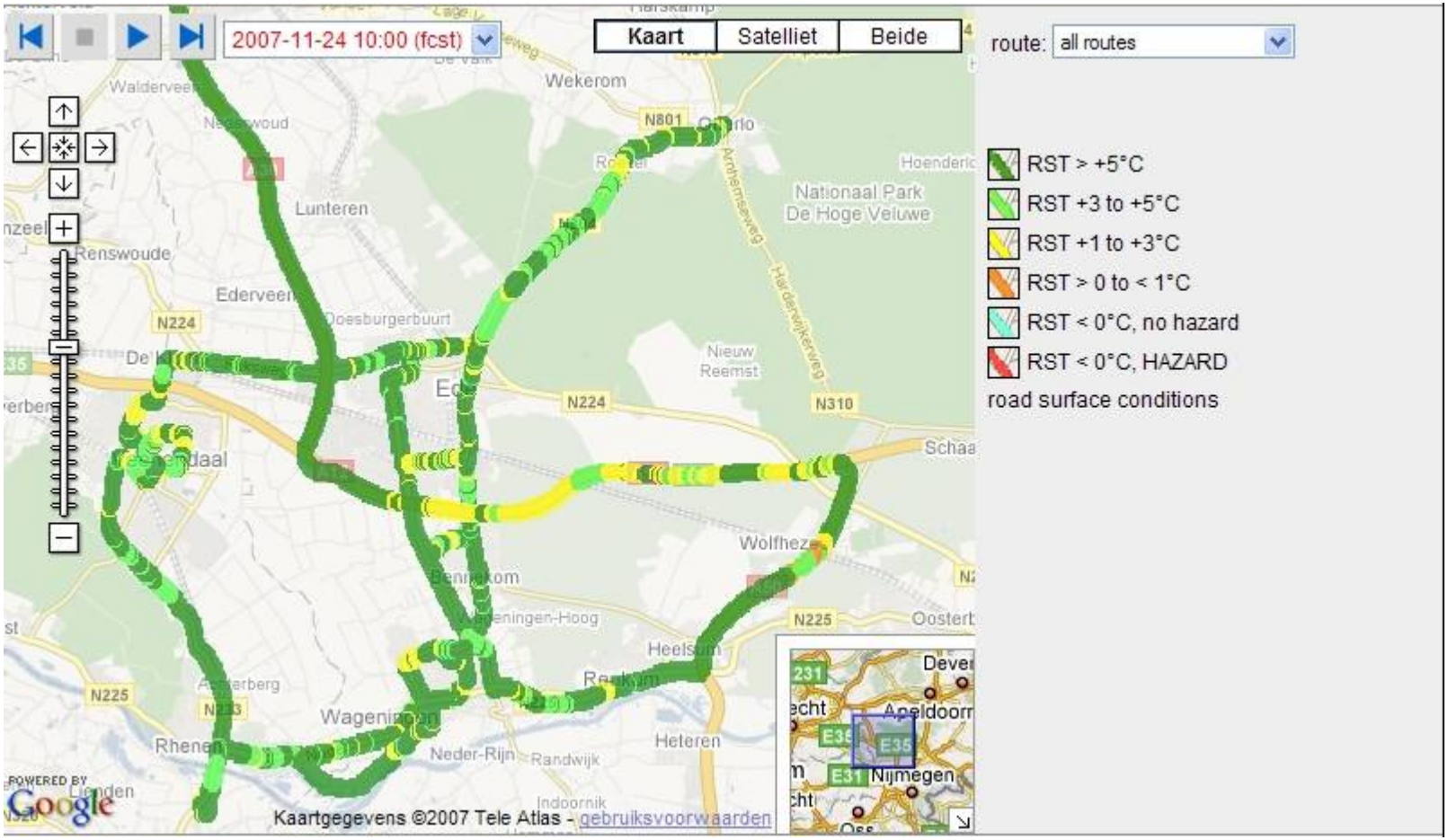
Example: 23/24 November 2007

09:00 h t+17



Example: 23/24 November 2007

10:00 h t+18



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New gritting methods

- Dynamical gritting
  - ➢Variable salt amount
- Dynamical routes
  - ➢Temperature based route

Current developments

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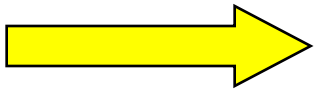
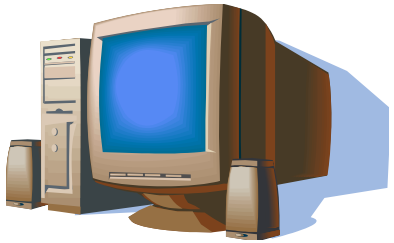
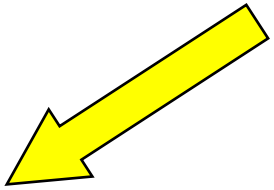
Weather- and road forecasting on routes





Optimize route- and salt dosage



Local control

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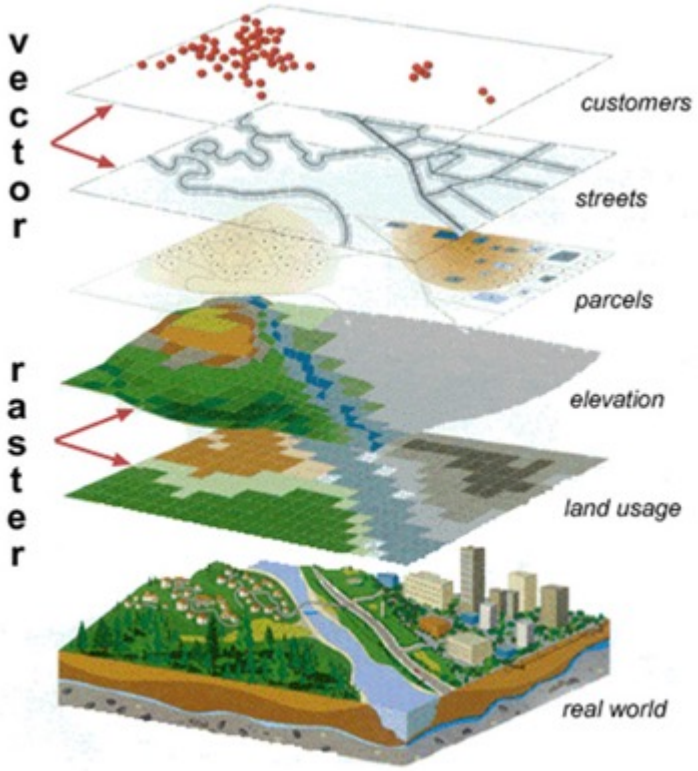
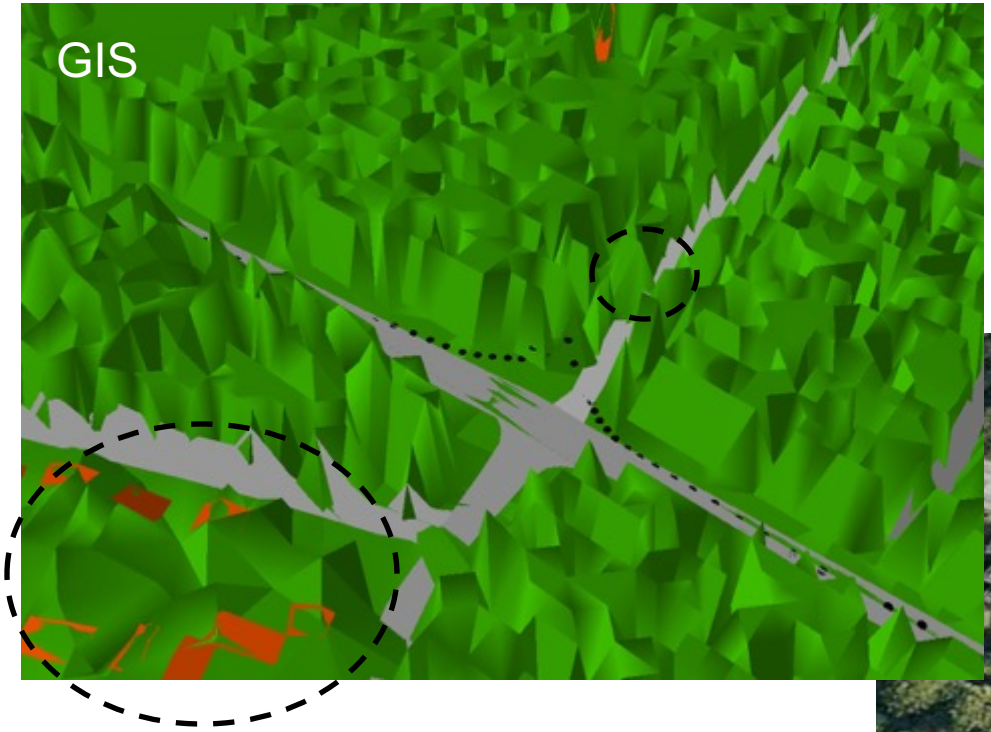
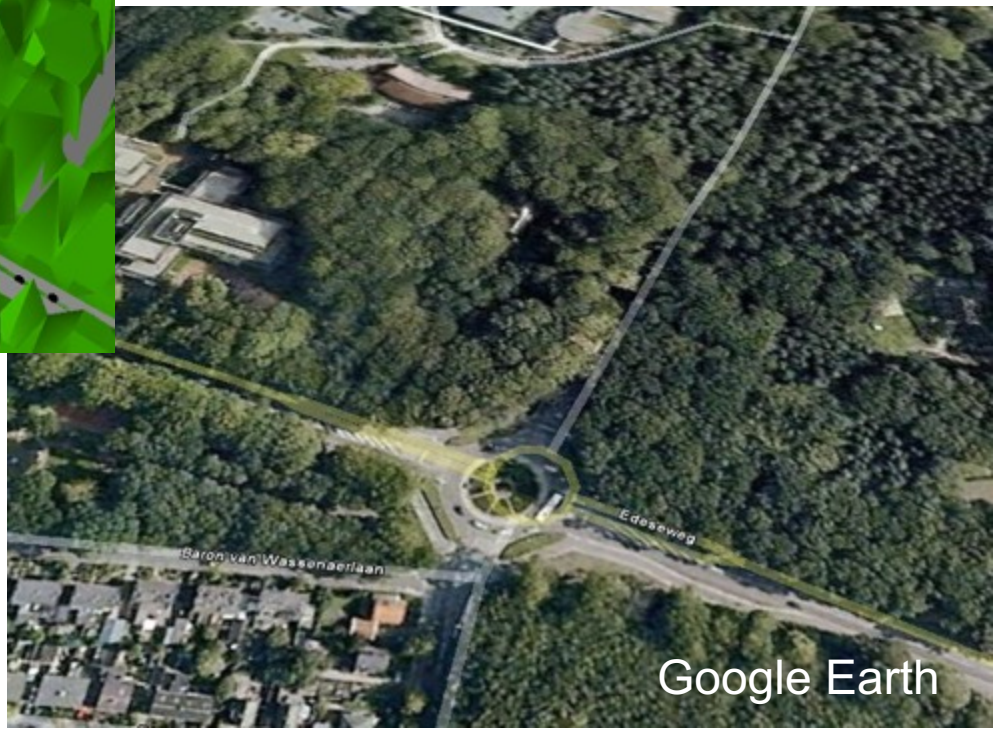
GIS derived skyview and solar view



Current developments





Current developments

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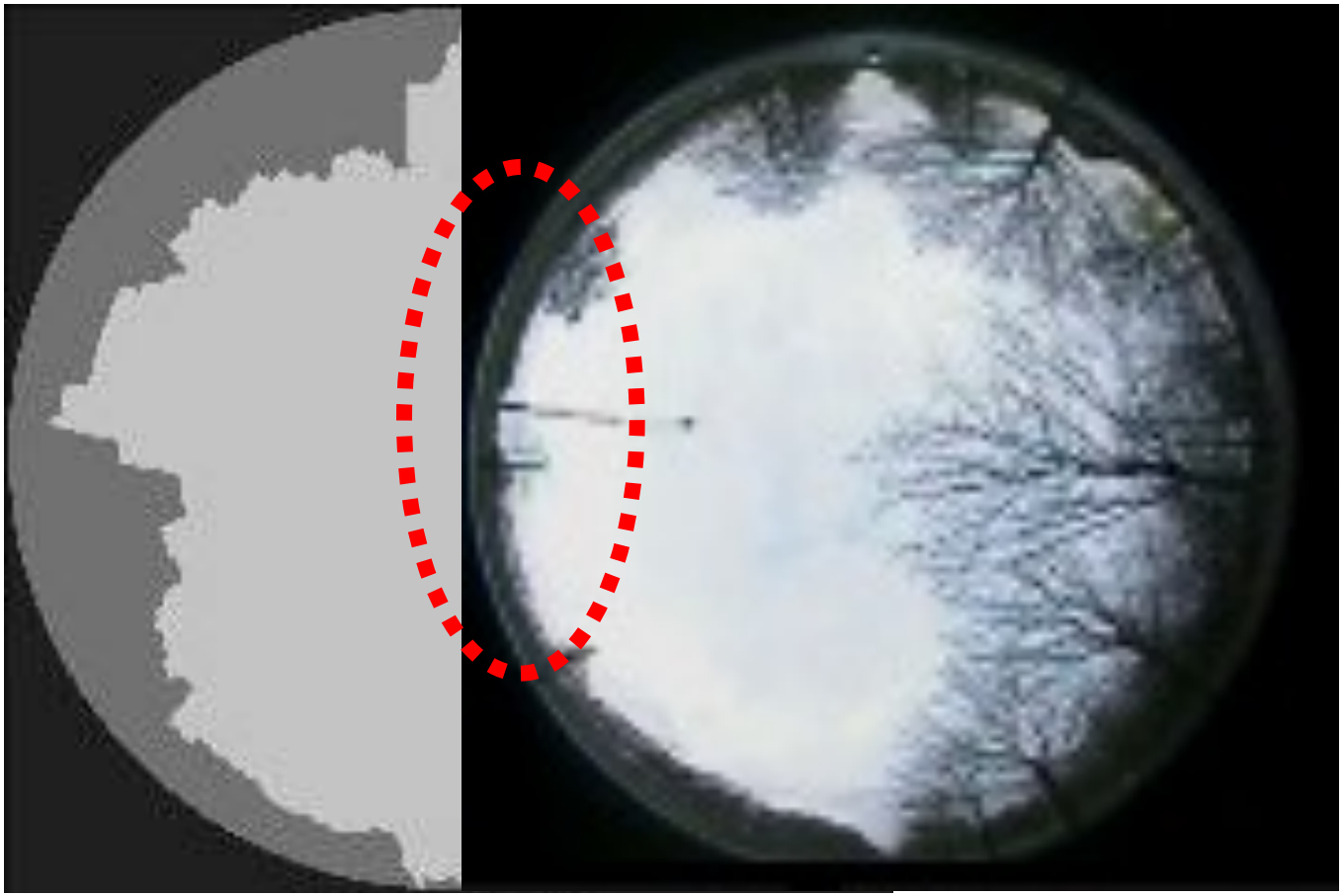

Current developments

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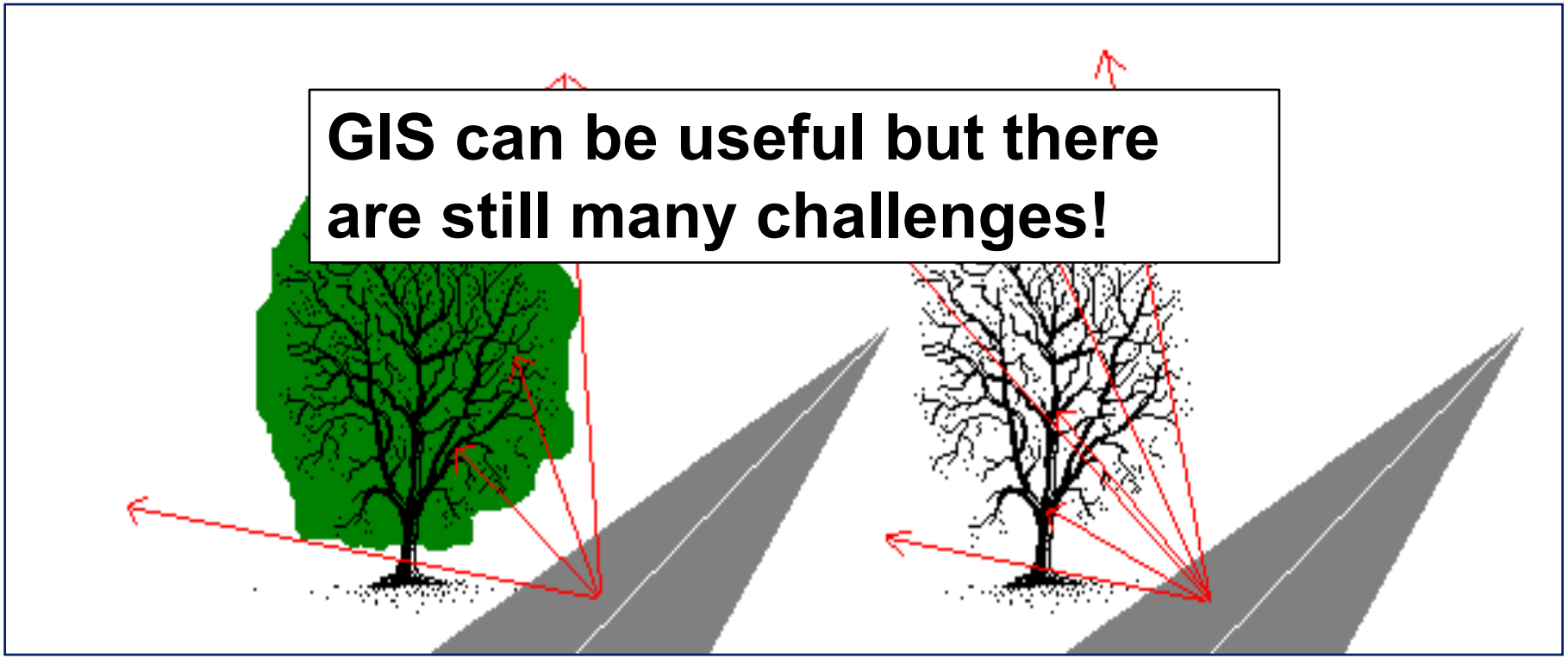
Tree leaves



Possibility: Vary the transparency of trees throughout the winter season to simulate leaf fall and growth!

The end

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