

Viamet: Advanced integration of meteorological data to achieve high resolution winter road condition forecasts

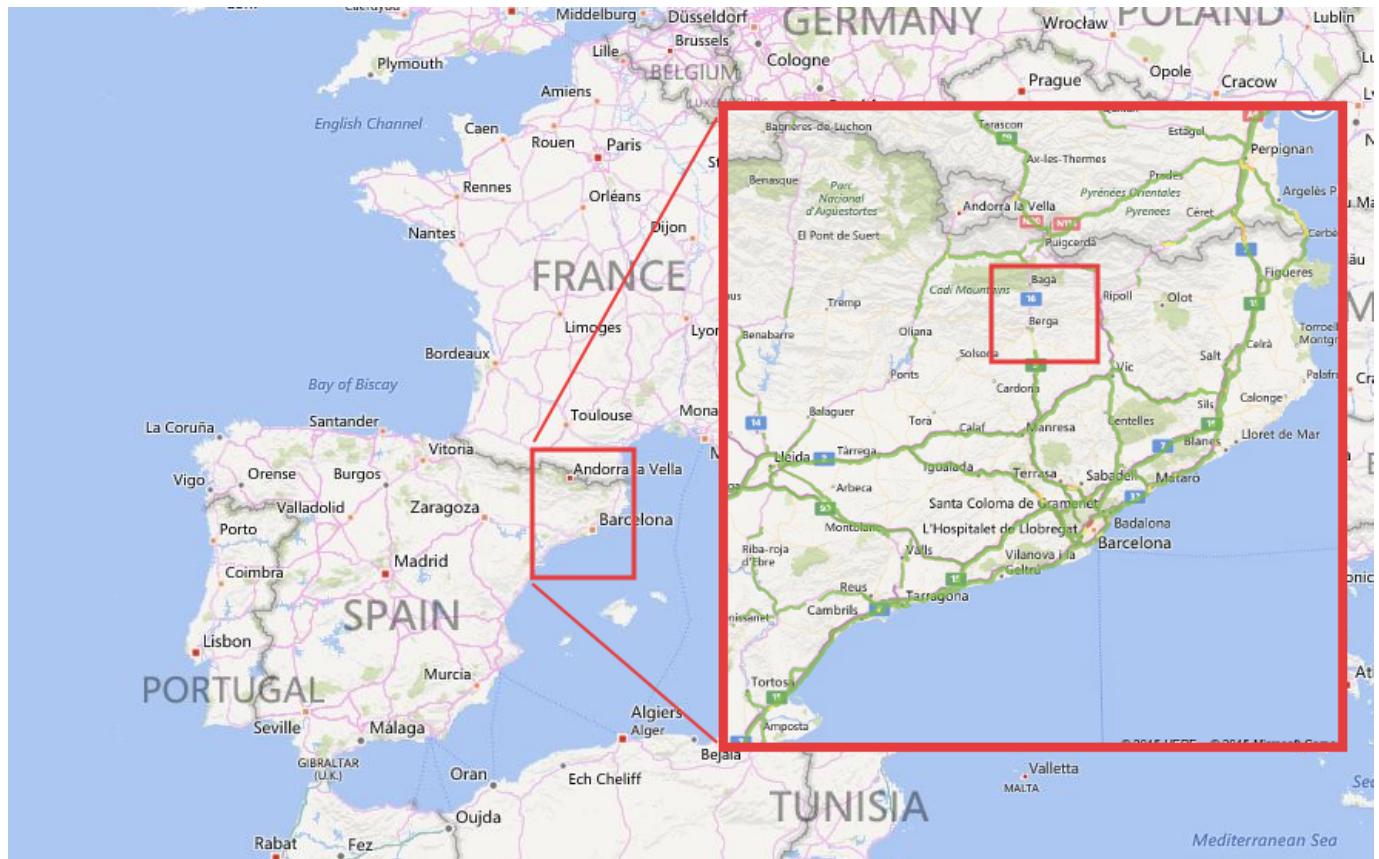
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The challenge

Road status forecasting along 500km of mountain roads



The region: El Berguedà

Highlands and flat zones



The region: El Berguedà

Reservoirs generating high moisture points (icy roads)



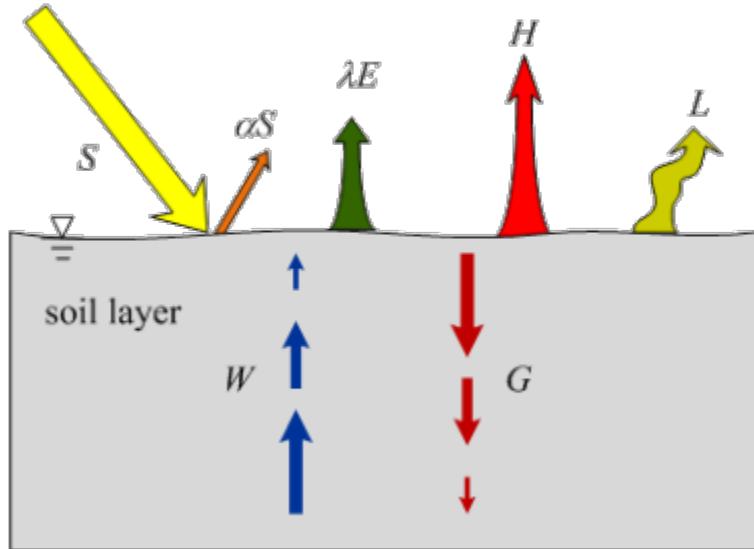
The region: El Berguedà

- Frequent thermal inversions
- High variety of roads
 - Trunk roads at the main valley
 - Small roads connecting mountain towns



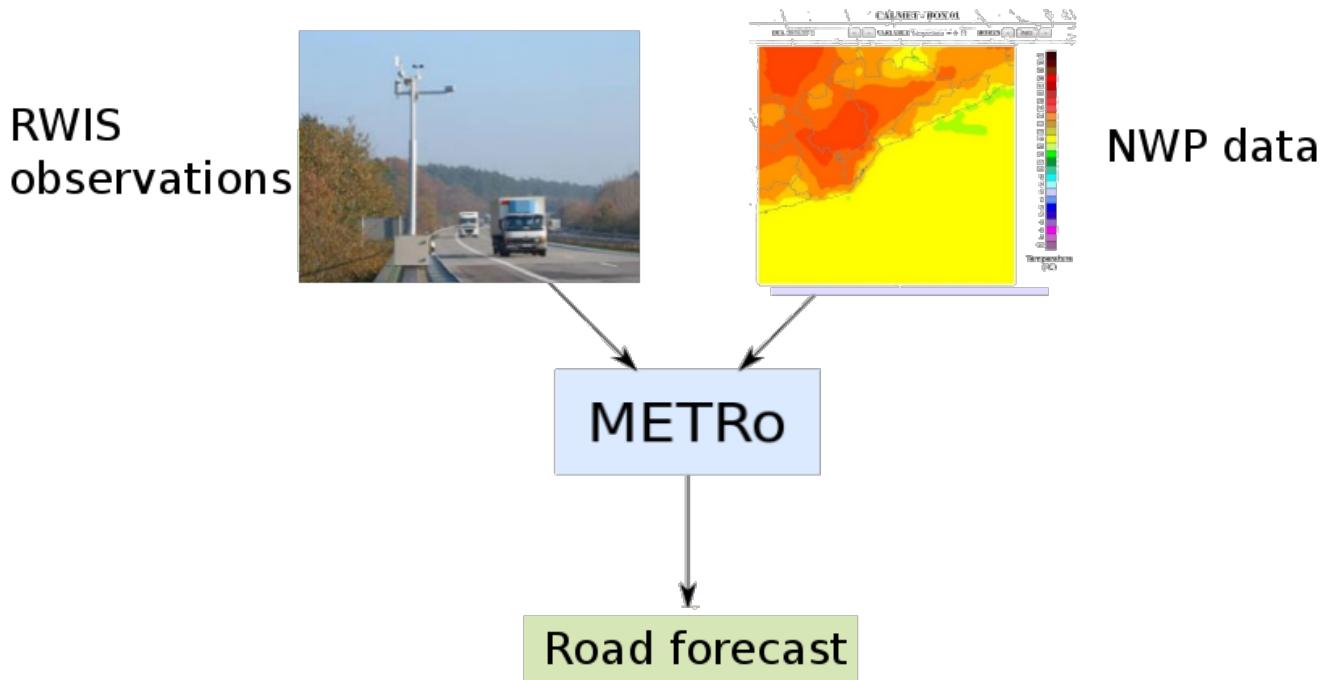
Usual solution

METRo model



- Energy balance
- Road conductivity
- Presence of precipitation

METRo model inputs



As many RWIS stations as points to forecast

Complex terrain means lots of points

Budget problem

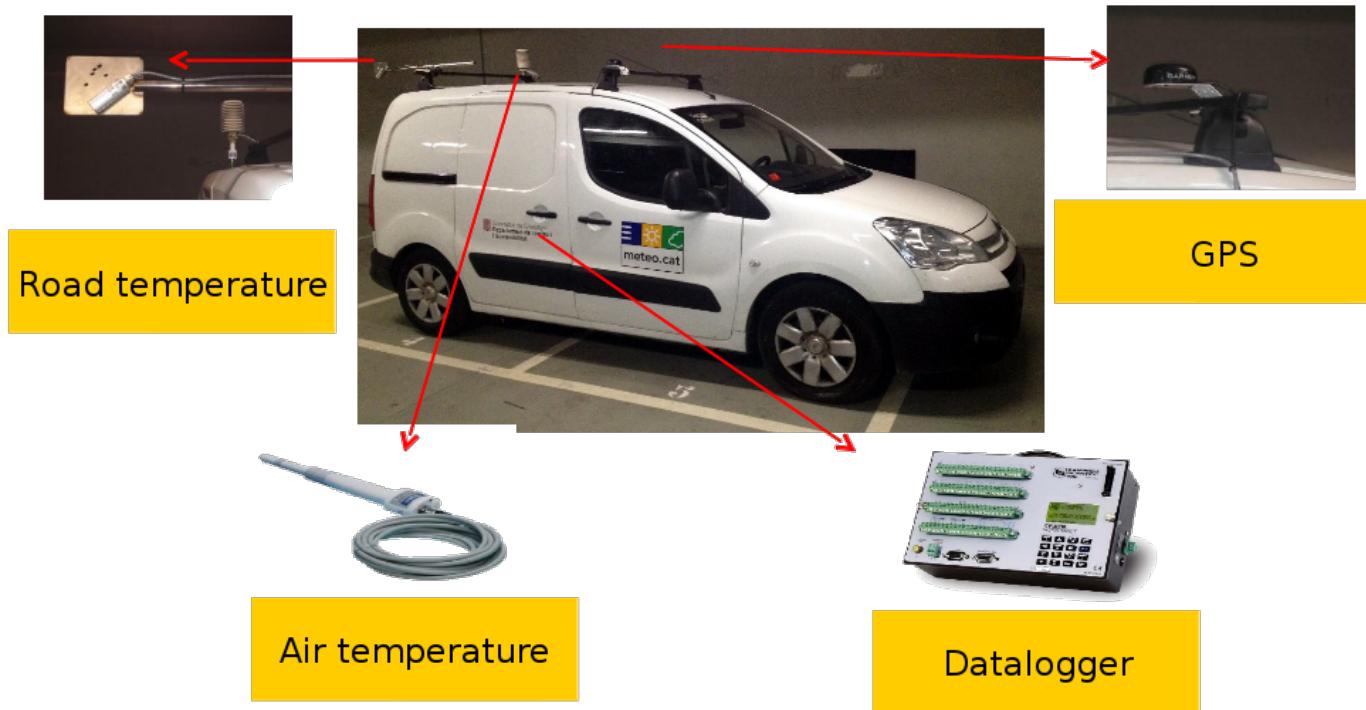
Our solution: 4 RWIS + "Virtual stations"

Calculating the RWIS variables from available data

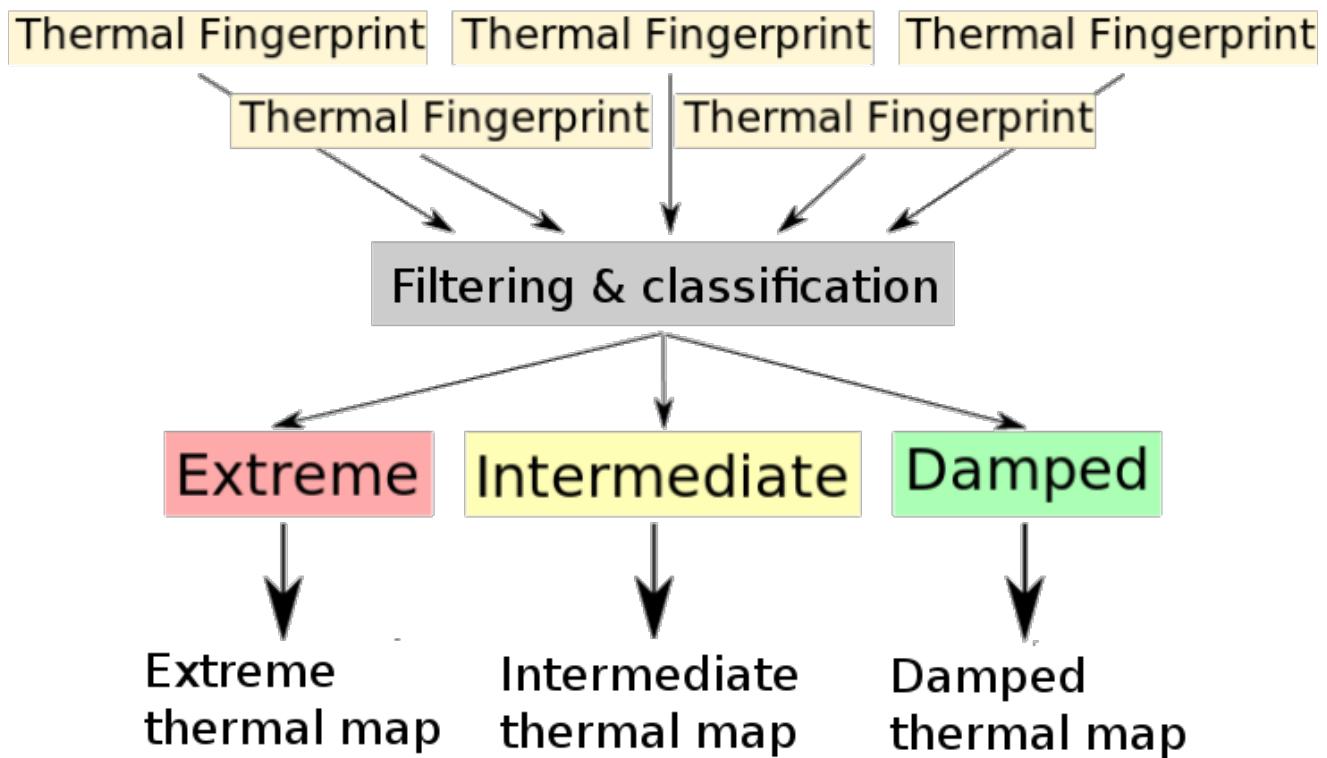
- Air temperature and dew point: Station data interpolation with residues
- Presence of precipitation using the weather radar data
- Wind taken from the CALMET downscaling model
- Road temperature and condition from the actual RWIS + thermal mapping

Enough data to calculate as many points as necessary

Thermal mapping equipment

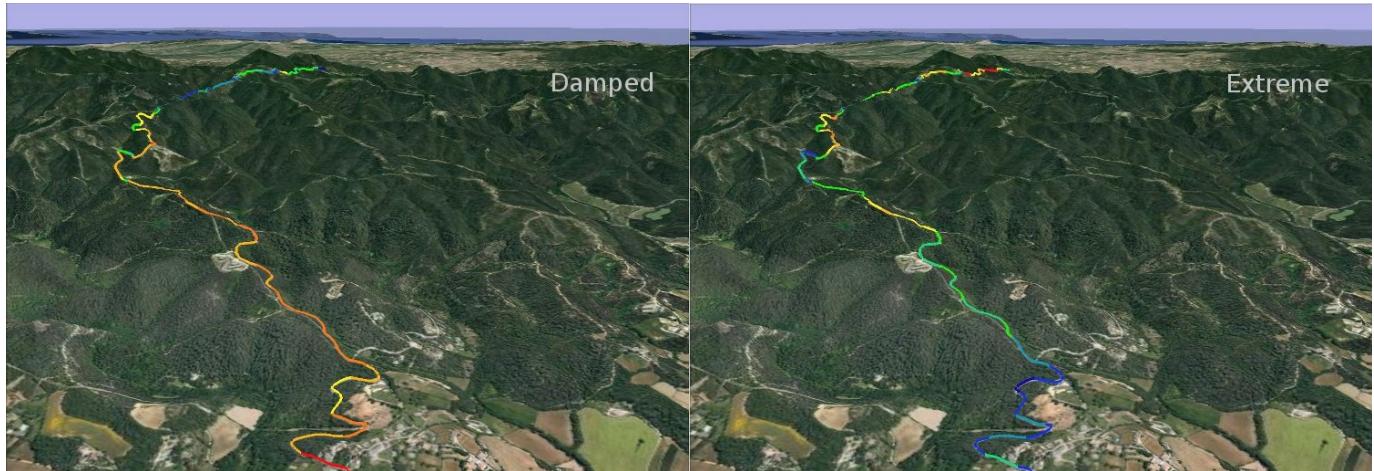


Thermal mapping creation



Based on the Pasquill-Gifford index

Changes depending on the situation



Technologies used

- Generating the data: Python
- Database: PostgreSQL with PostGIS
- Web server: NodeJS
- Web page: AngularJS
- Mapping: OpenLayers 3

The actual
page