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XIII INTERNATIONAL WINTER ROAD CONGRESS

QUÉBEC, FEBRUARY 8 TO 11, 2010

WORLD ROAD ASSOCIATION
MONDIALE DE LA ROUTE
AIPCR PIARC

Québec

SUSTAINABLE WINTER SERVICE FOR ROAD USERS

Optima : Road weather informations dedicated to road sections

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METEO FRANCE
Toujours un temps d'avance

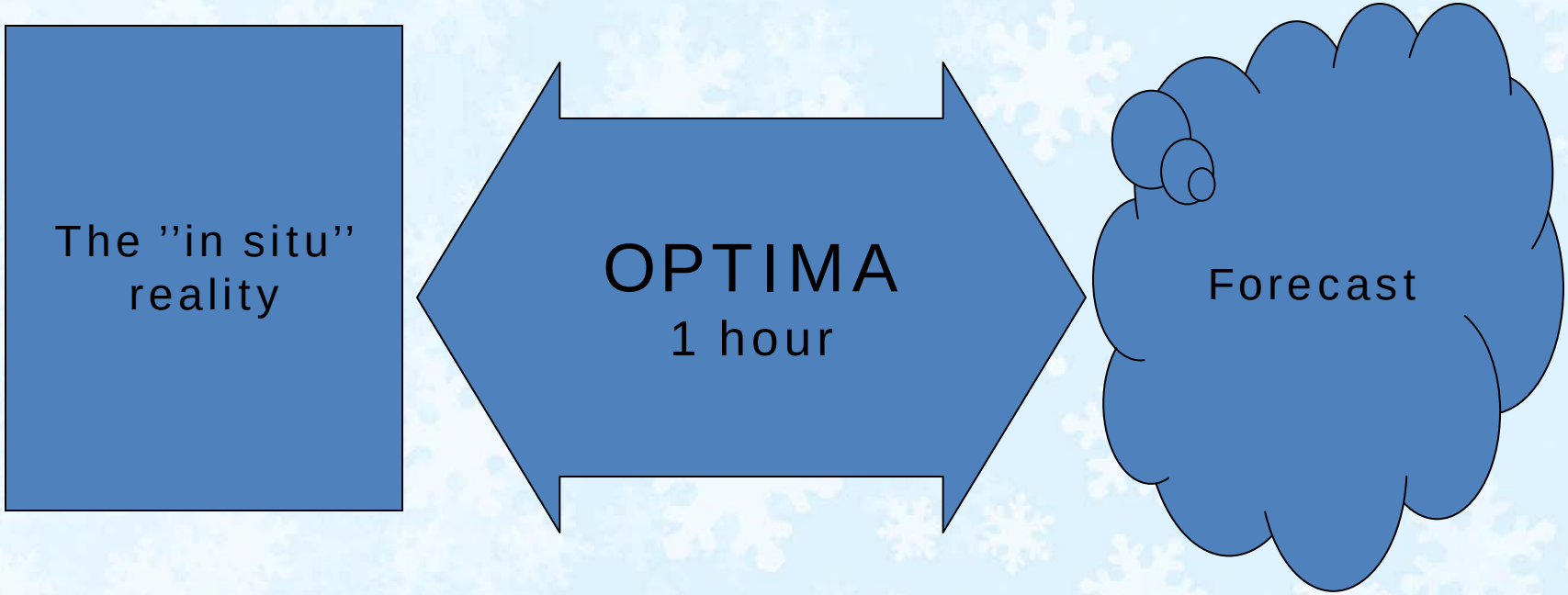
1. Optima's general presentation
2. The visualisation of the forecasted parameters
3. The road weather risk interface in Optima
4. The follow-up of a snow event on France
5. Conclusions

OPTIMA

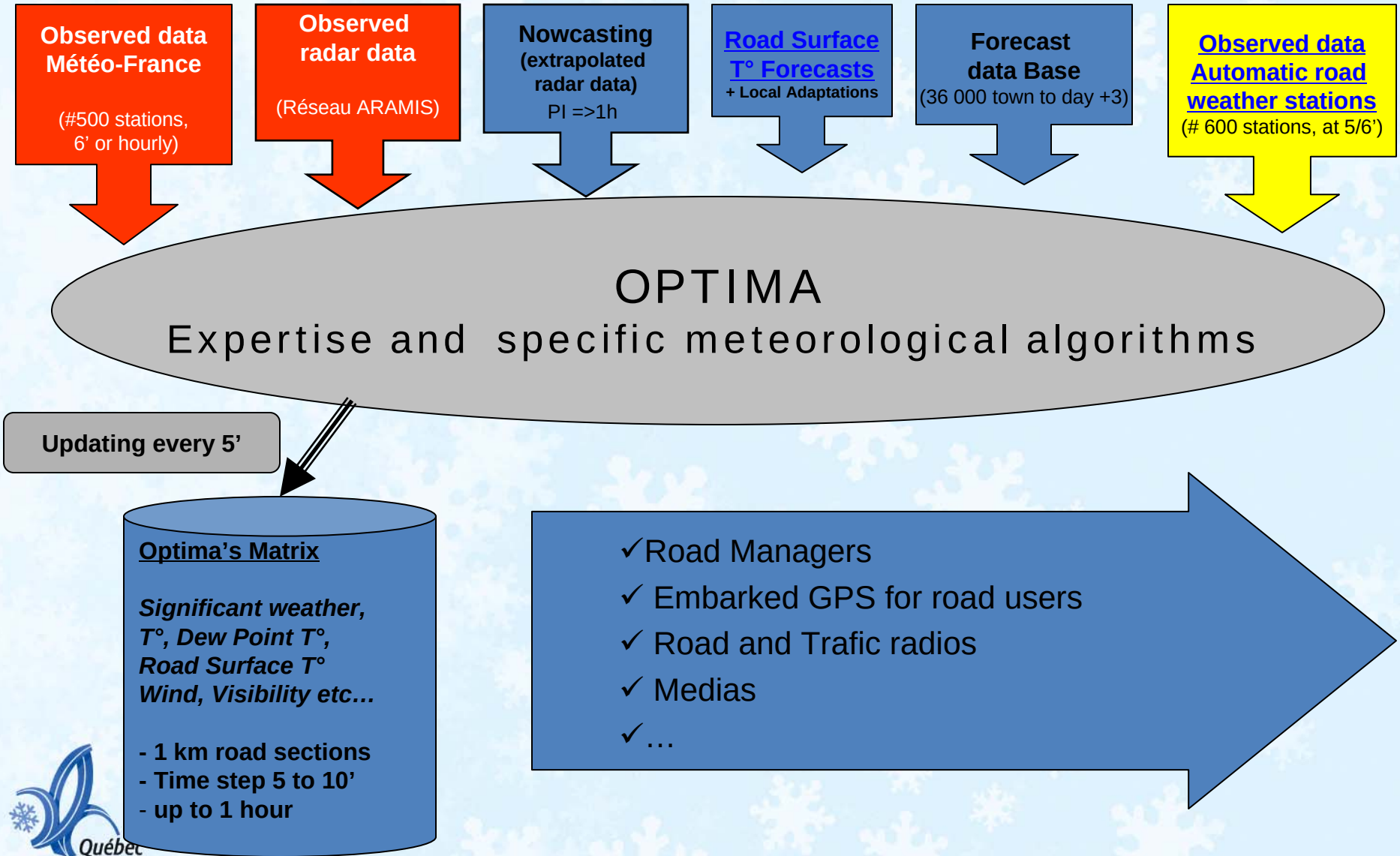
- **OPTIMA (Road weather informations dedicated to road sections), is a global approach of data fusion and specific road weather algorithms implementation, to obtain the best road weather information, according to the state of art, at 1 km resolution, on the road network.**

- **In 2009, 120 000 km of the french road network are covered**.

OPTIMA : link between reality and forecast



OPTIMA : Synthetic diagram



Forecasted parameters in Optima

- **Precipitations** : Freezing Rain, Snow, Sleet, Hail,Rain, Drizzle.
- **Intensity of the precipitations**: light, moderate or heavy.
- **Air and dew point Temperature**
- **Road Surface Temperature**
- **Altitude of the Rain/Snow transition**
- **Wind and squalls**
- **Visibility**
- **Thunderstorms**
- *Road surface condition*
- *Snow height*

At each parameter is associated a fiability index according to the quality, and the amount, of input sources.

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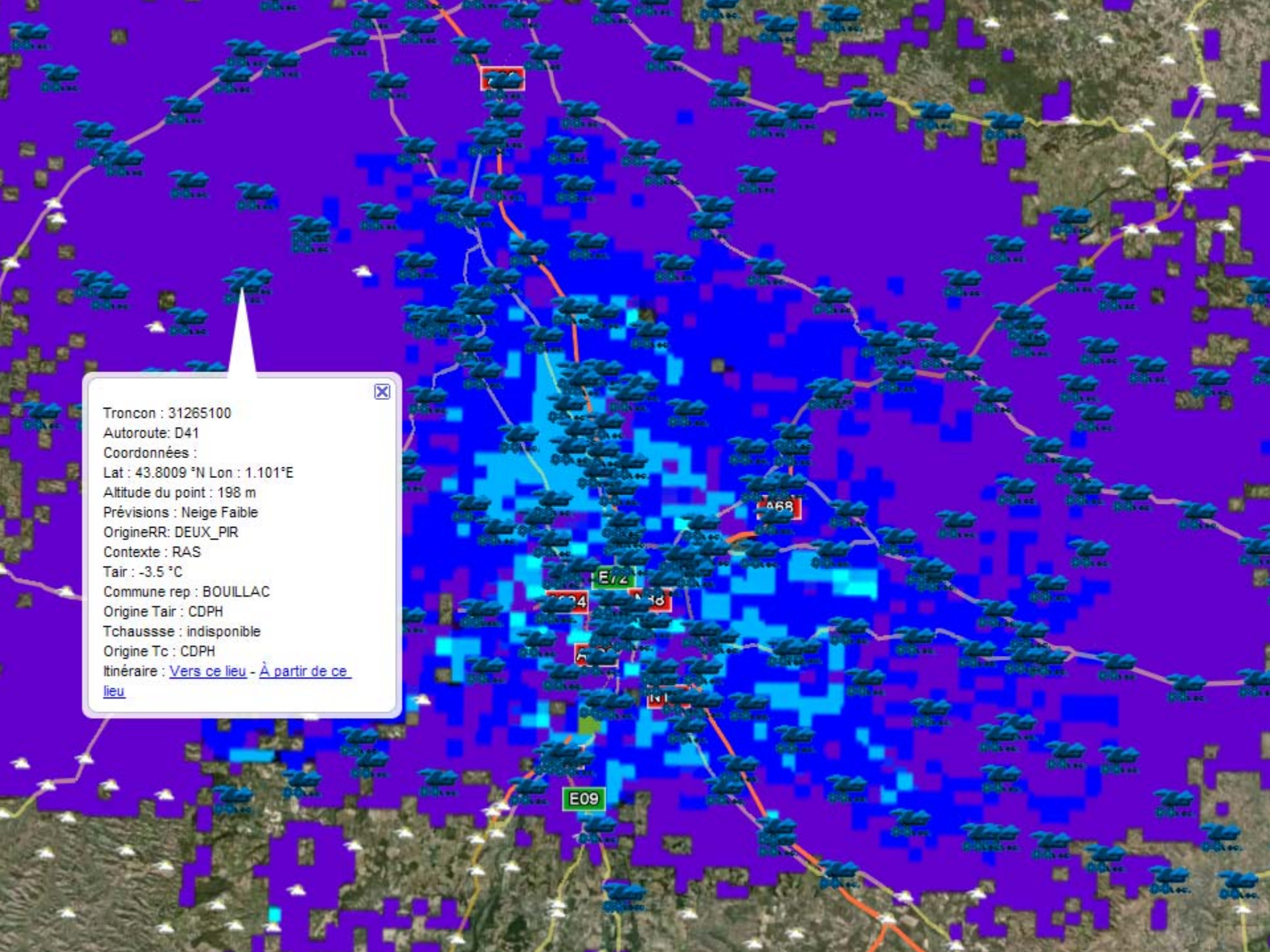
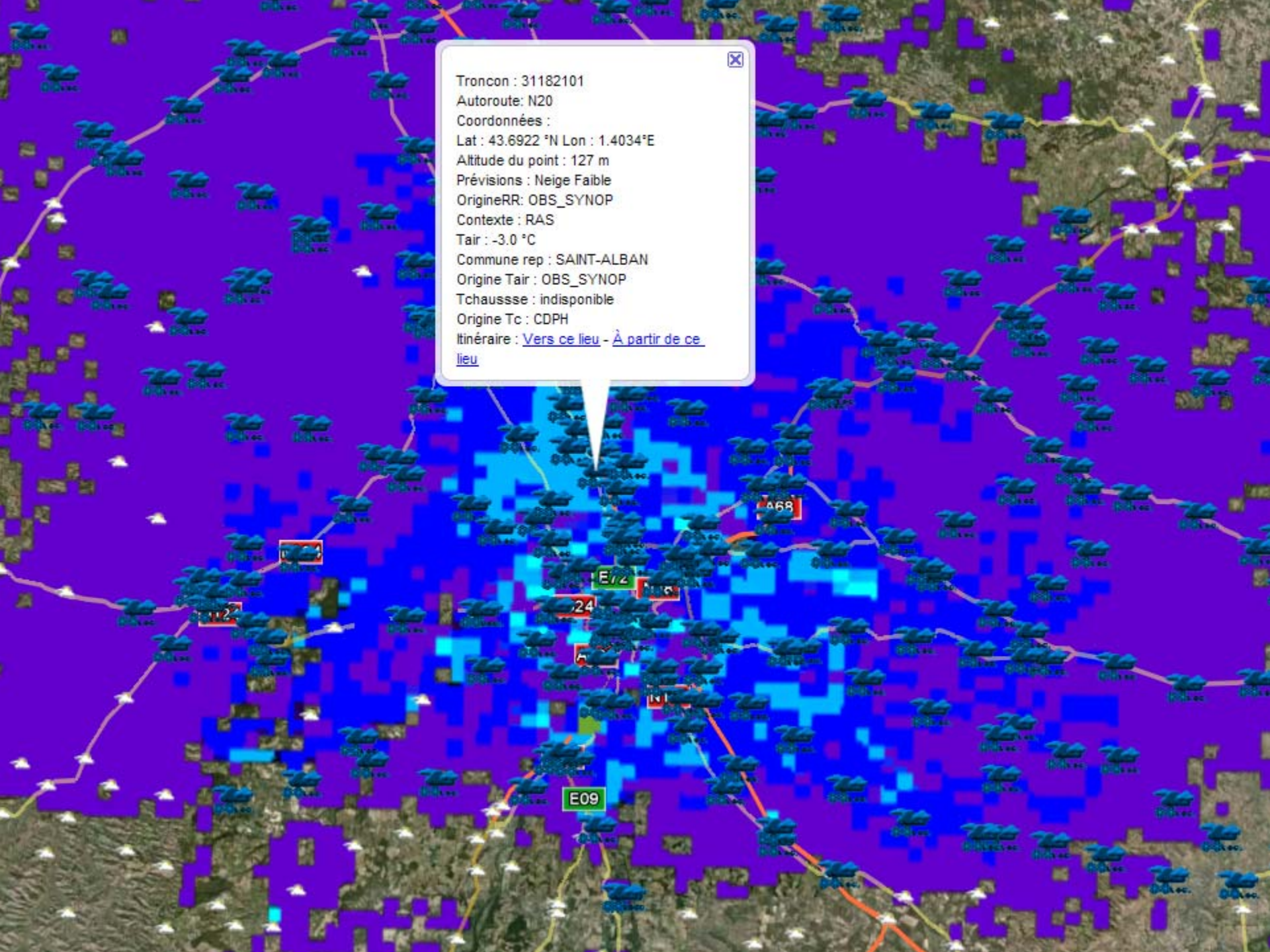
Observed and forecasted data fusion


Troncon : 31265100
Autoroute: D41
Coordonnées :
Lat : 43.8009 °N Lon : 1.101°E
Altitude du point : 198 m
Prévisions : Neige Faible
OrigineRR: DEUX_PIR
Contexte : RAS
Tair : -3.5 °C
Commune rep : BOUILLAC
Origine Tair : CDPH
Tchaussse : indisponible
Origine Tc : CDPH
Itinéraire : Vers ce lieu - À partir de ce lieu
E09


Troncon : 31182101
Autoroute: N20
Coordonnées :
Lat : 43.6922 °N Lon : 1.4034°E
Altitude du point : 127 m
Prévisions : Neige Faible
OrigineRR: OBS_SYNOP
Contexte : RAS
Tair : -3.0 °C
Commune rep : SAINT-ALBAN
Origine Tair : OBS_SYNOP
Tchaussse : indisponible
Origine Tc : CDPH
Itinéraire : Vers ce lieu - À partir de ce lieu
A68
E09

Optima : the treatments

- **First step** : Initialization of the forecasts with the best source of available data :
  - Extrapolated radar data for the precipitations
  - Spécific modelisation for the road surface temperature
  - Meteo-France forecasts data base for the other parameters

- **Second step** : Discrimination between the different types of precipitations:
  - rain and snow according to Tair
  - Freezing rain according to the forecasts appraised by forecasters, the occurrence of precipitations and Tair

- **Last step** : the updating of the forecasts with available observations (Spécific algorithms for each parameters)

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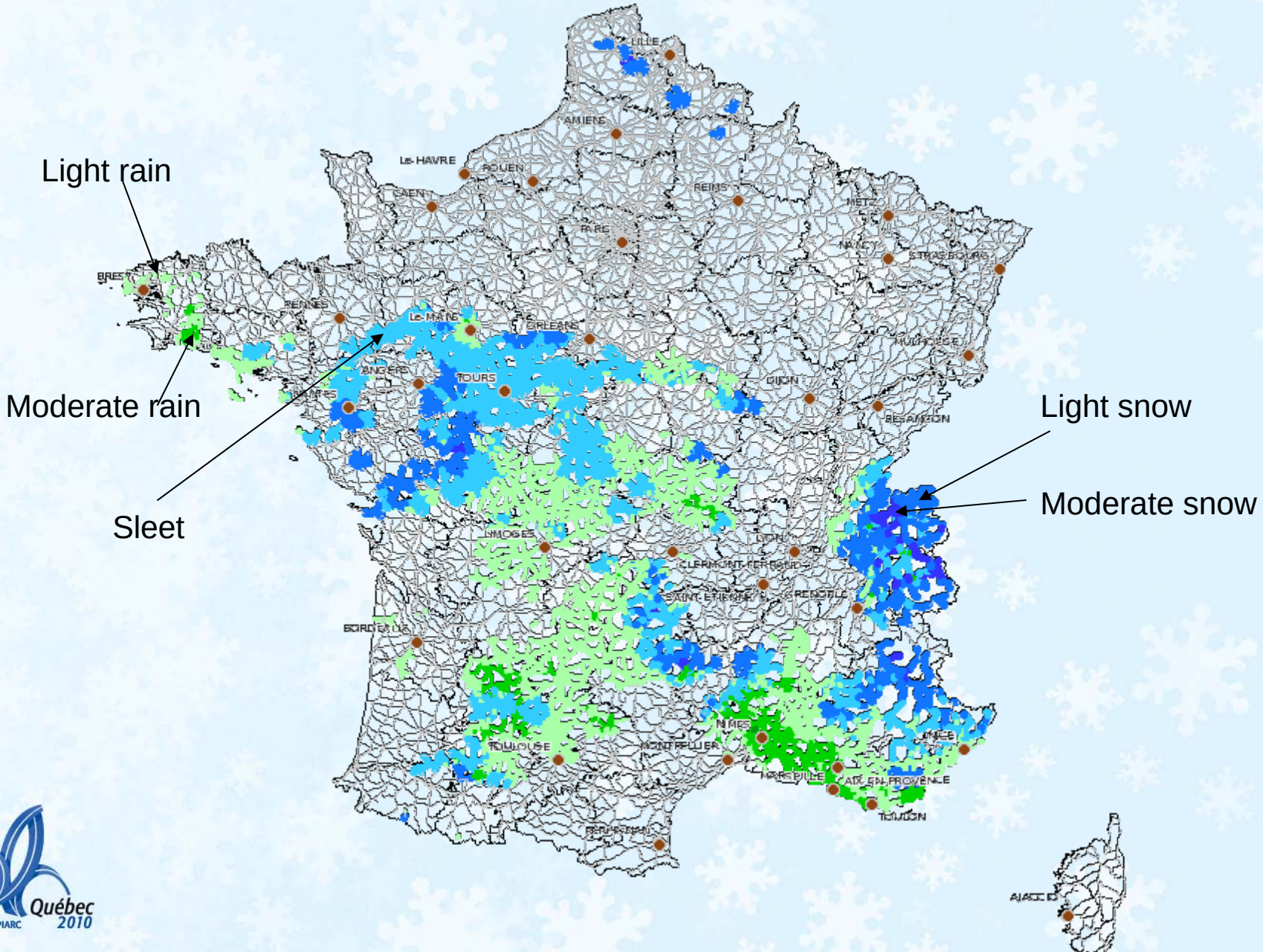
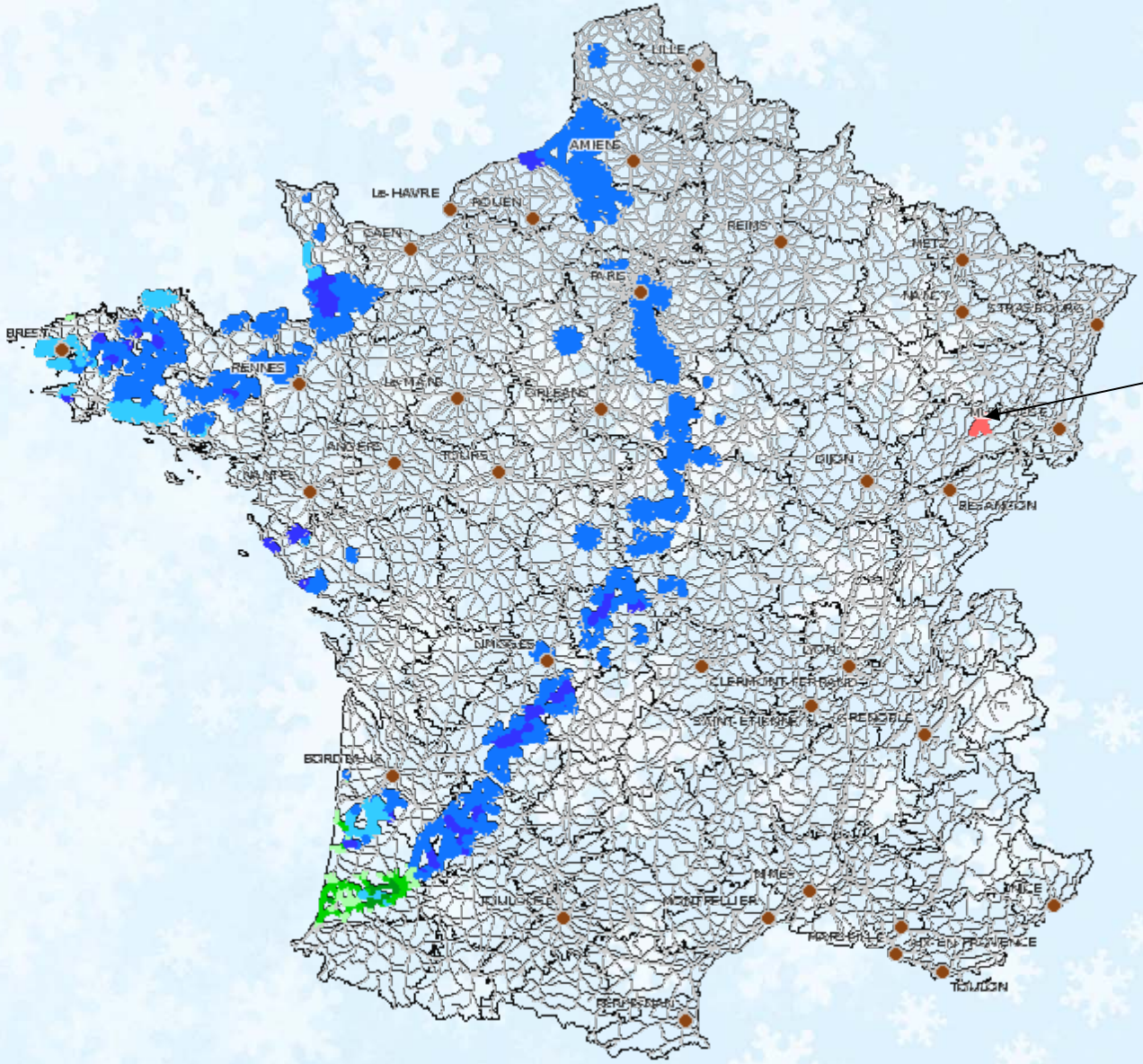
Precipitations : 21/12/2009 – 13H10



Précipitations : 6/01/2010 – 10H50



Freezing drizzle
(Forecasts corrected with an observation)

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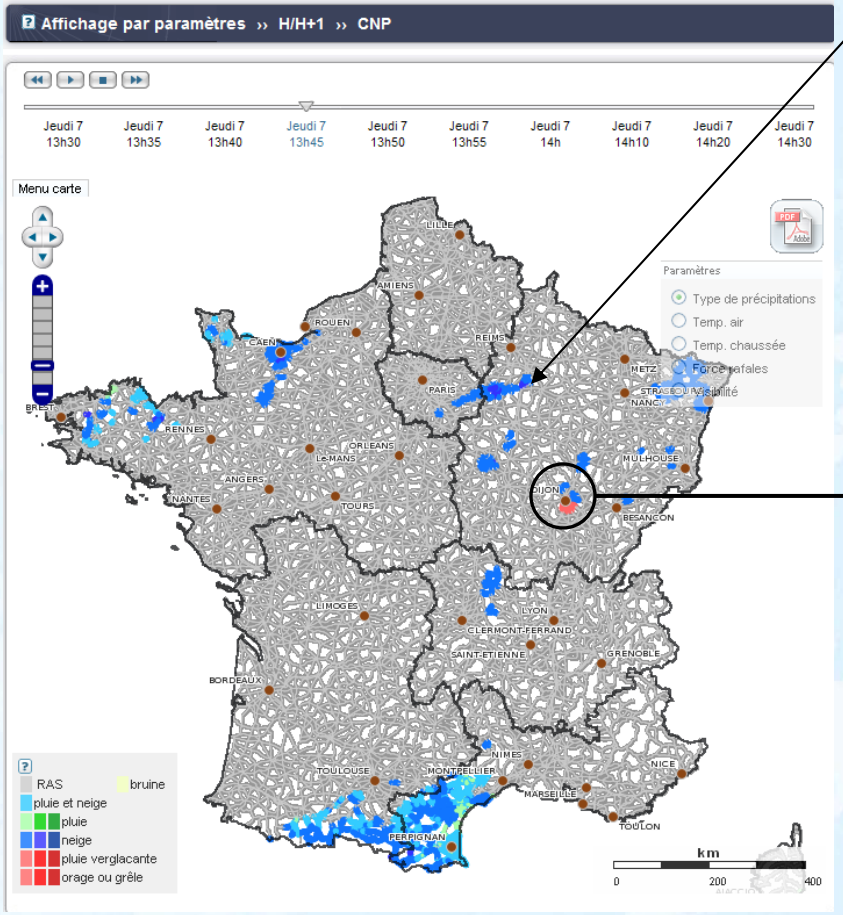
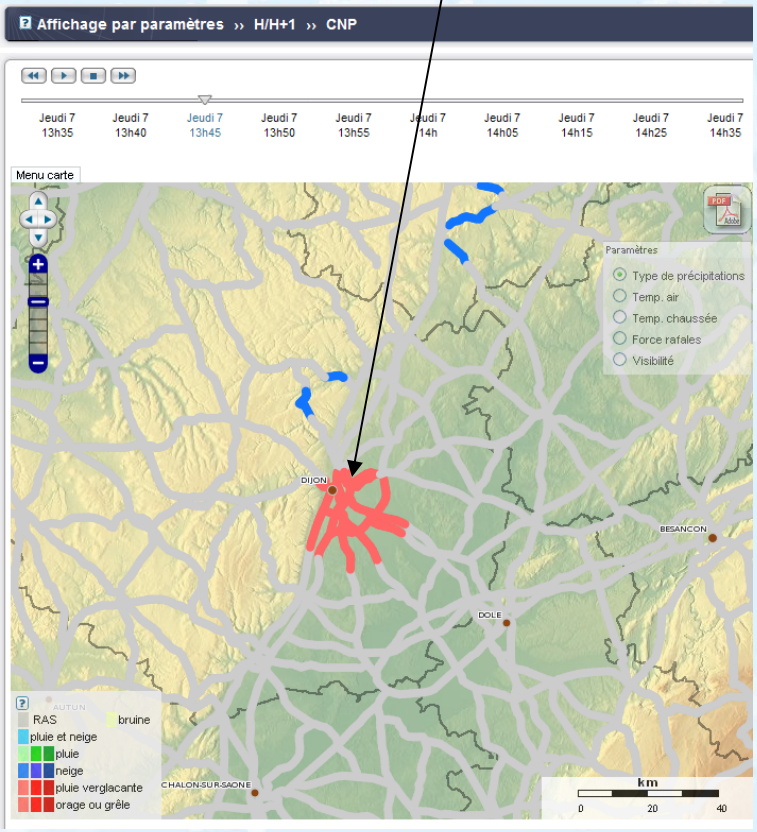
Precipitations : forecast for the 7/01/2010 at 13H45

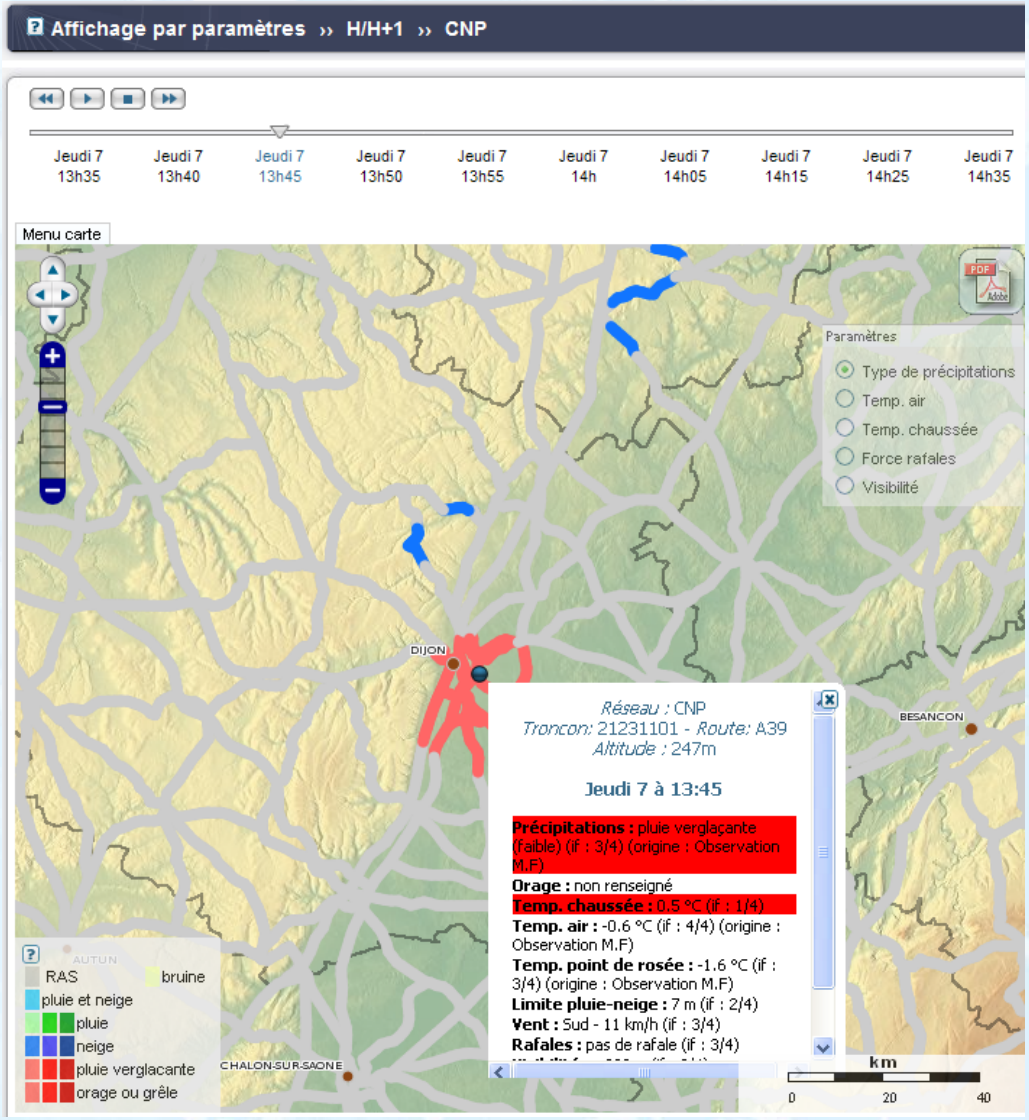
Snow

Freezing rain near Dijon





Freezing rain in Dijon the 07/01/2010 at 13H45



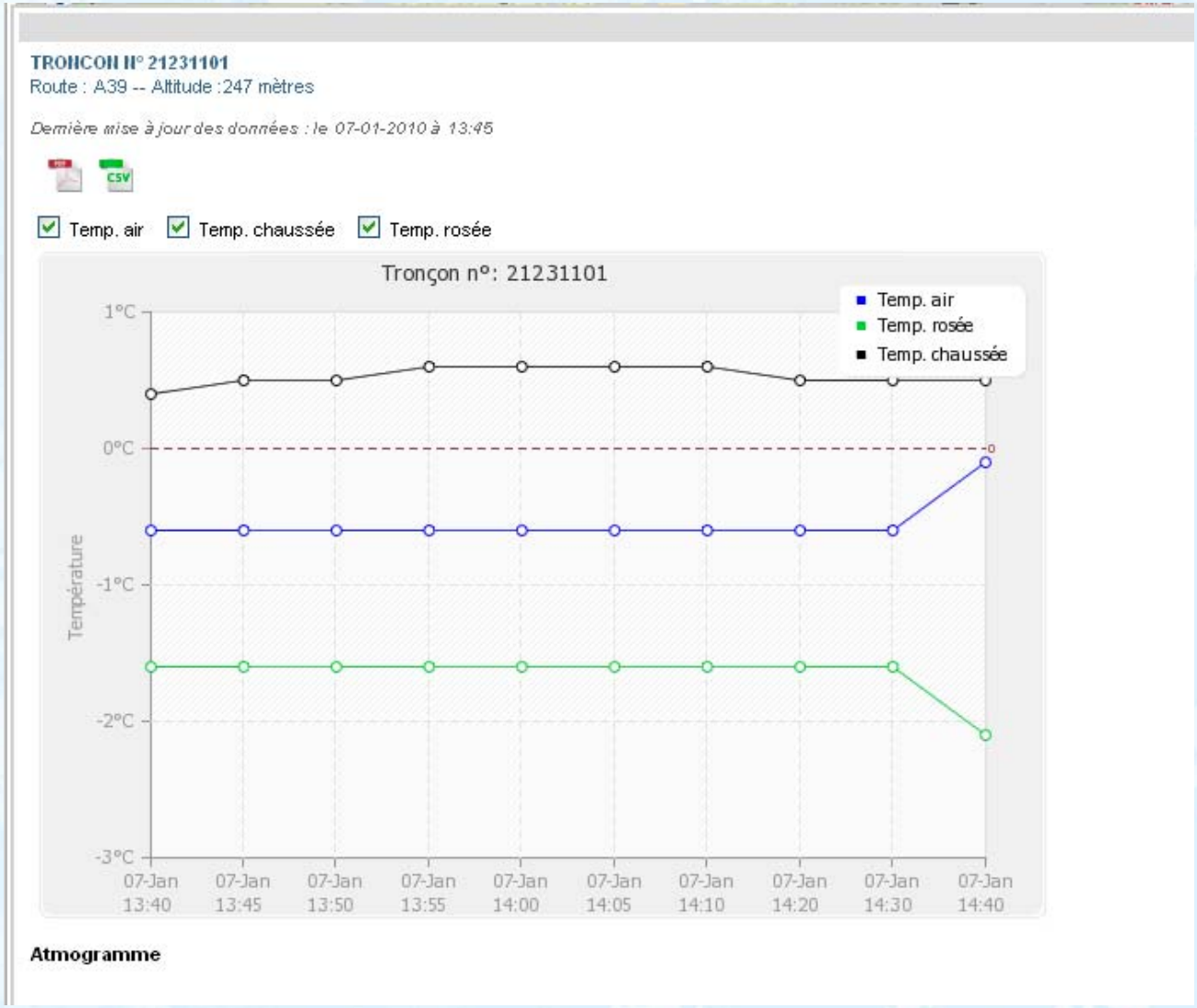
Dijon : forecast between 13H35 and 14H35 the 7th of january 2010

TRONCON N° 21231101
Route : A39 -- Altitude : 247 mètres

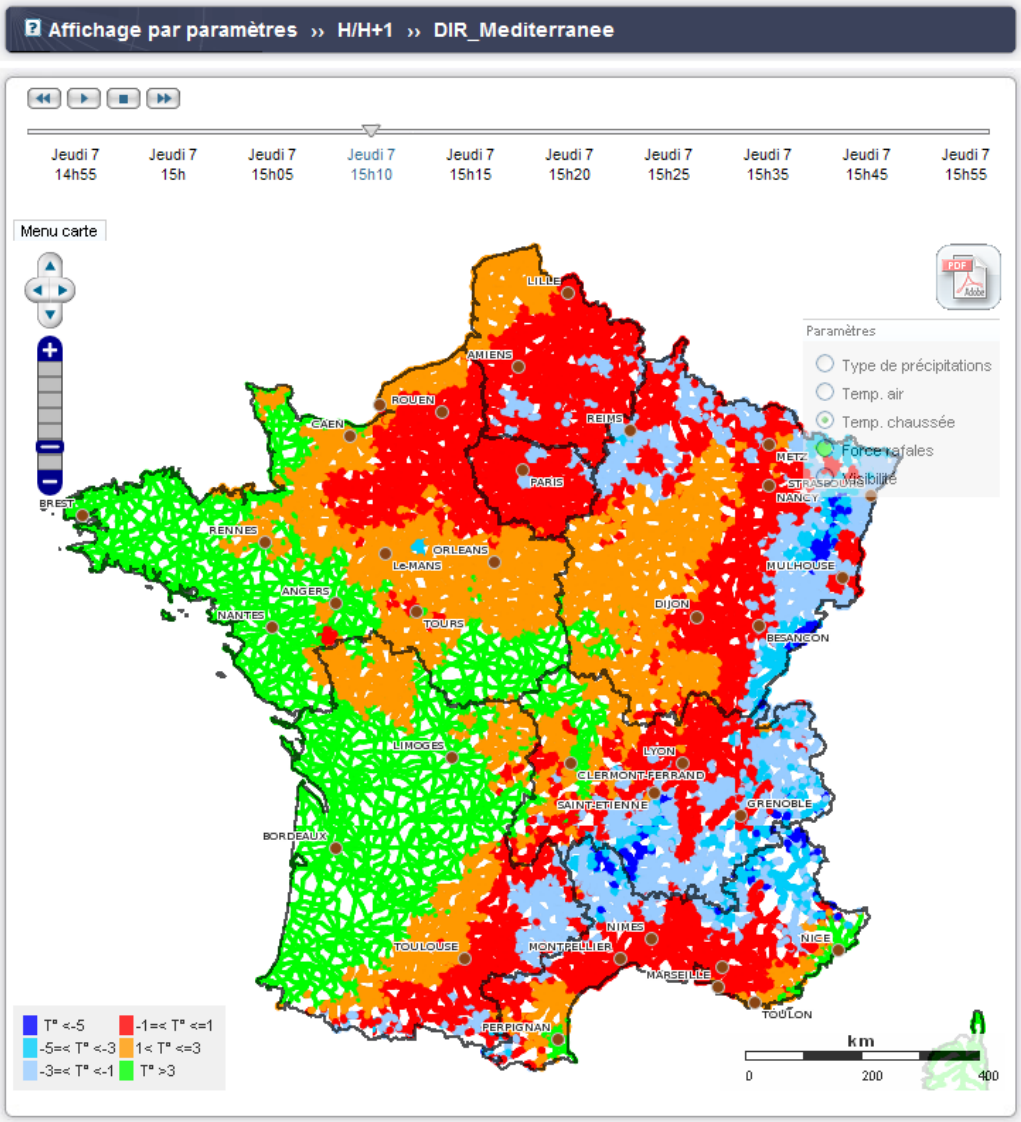
Dernière mise à jour des données : le 07-01-2010 à 13:40

	Jeudi 7									
	13:35	**13:40**	**13:45**	**13:50**	**13:55**	**14:00**	**14:05**	**14:15**	**14:25**	**14:35**
Précipitations										
Température de chaussée	0.4 °	0.4 °	0.5 °	0.5 °	0.6 °	0.6 °	0.6 °	0.6 °	0.5 °	0.5 °
Température de l'air	-0.6 °	-0.6 °	-0.6 °	-0.6 °	-0.6 °	-0.6 °	-0.6 °	-0.6 °	-0.6 °	-0.1 °
Température point de rosée	-1.6 °	-1.6 °	-1.6 °	-1.6 °	-1.6 °	-1.6 °	-1.6 °	-1.6 °	-1.6 °	-1.9 °
Limite Pluie Neige	7	7	7	7	7	7	7	7	7	82
Vent	Sud - 11 km/h	Sud - 11 km/h	Sud - 11 km/h	Sud - 11 km/h	Sud - 11 km/h	Sud - 11 km/h	Sud - 11 km/h	Sud - 11 km/h	Sud - 11 km/h	Sud - 11 km/h
Rafales	-	-	-	-	-	-	-	-	-	-
Visibilité	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m

Dijon : graph of temperatures in Dijon between 13H40 and 14H40 on 07/01/2010



Road surface temperature : the 07/01/2010 at 15H10



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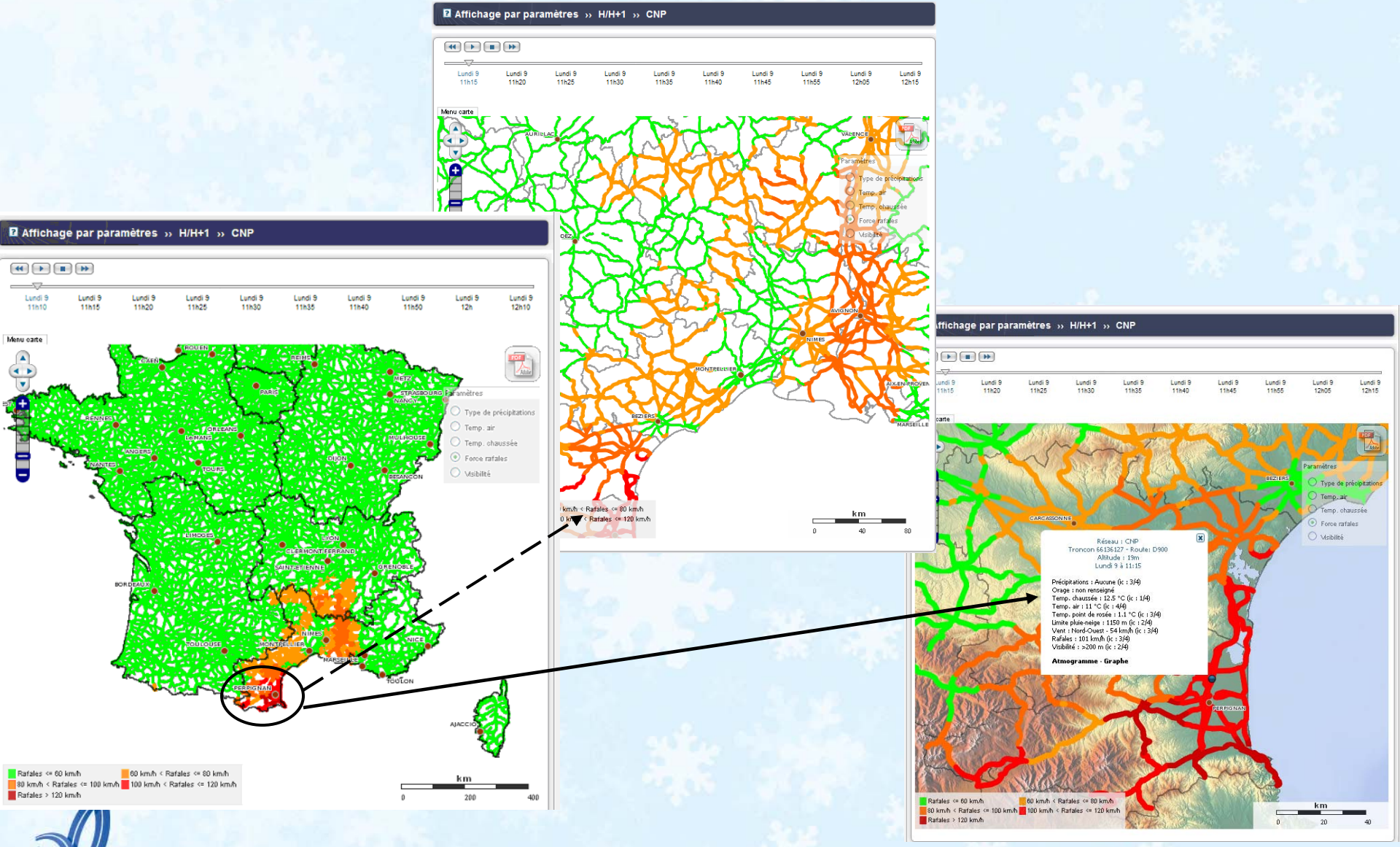
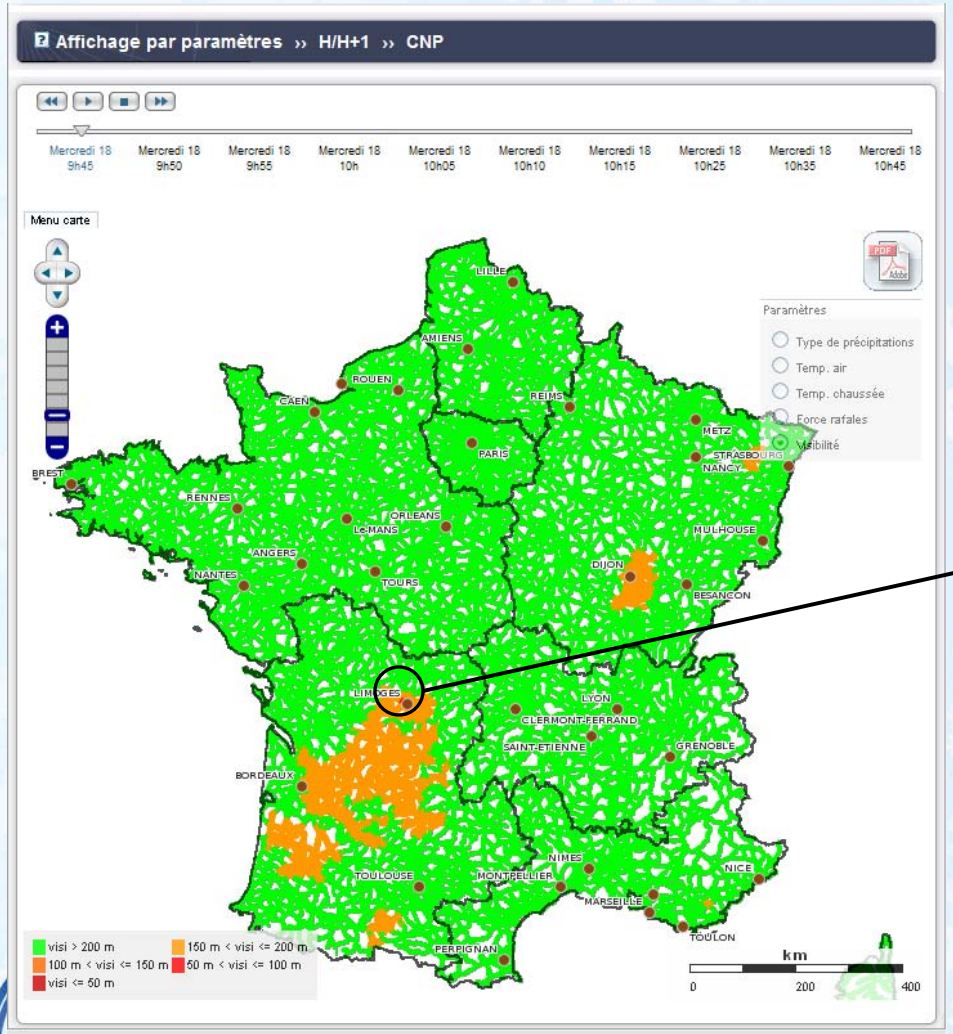
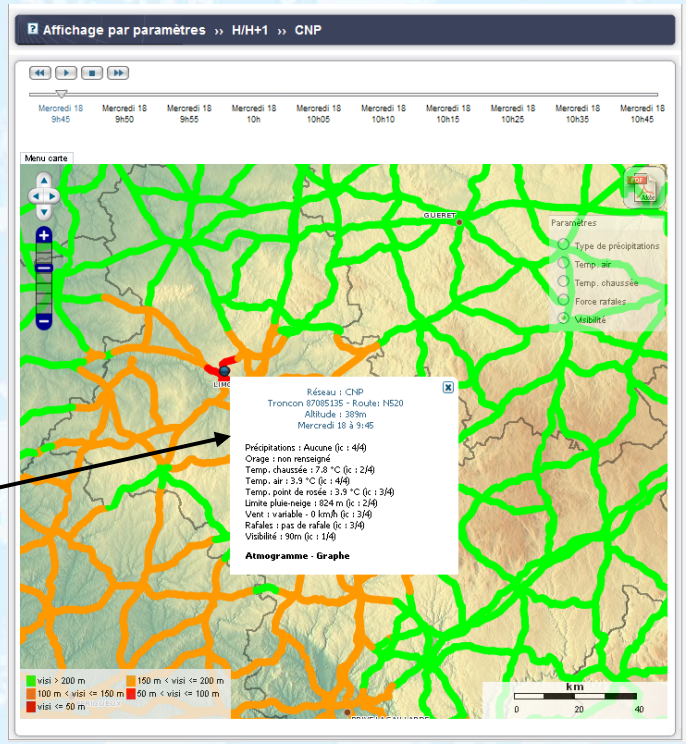
Squalls : 101 km/h near Perpignan



Visibility : 90 m near Limoges





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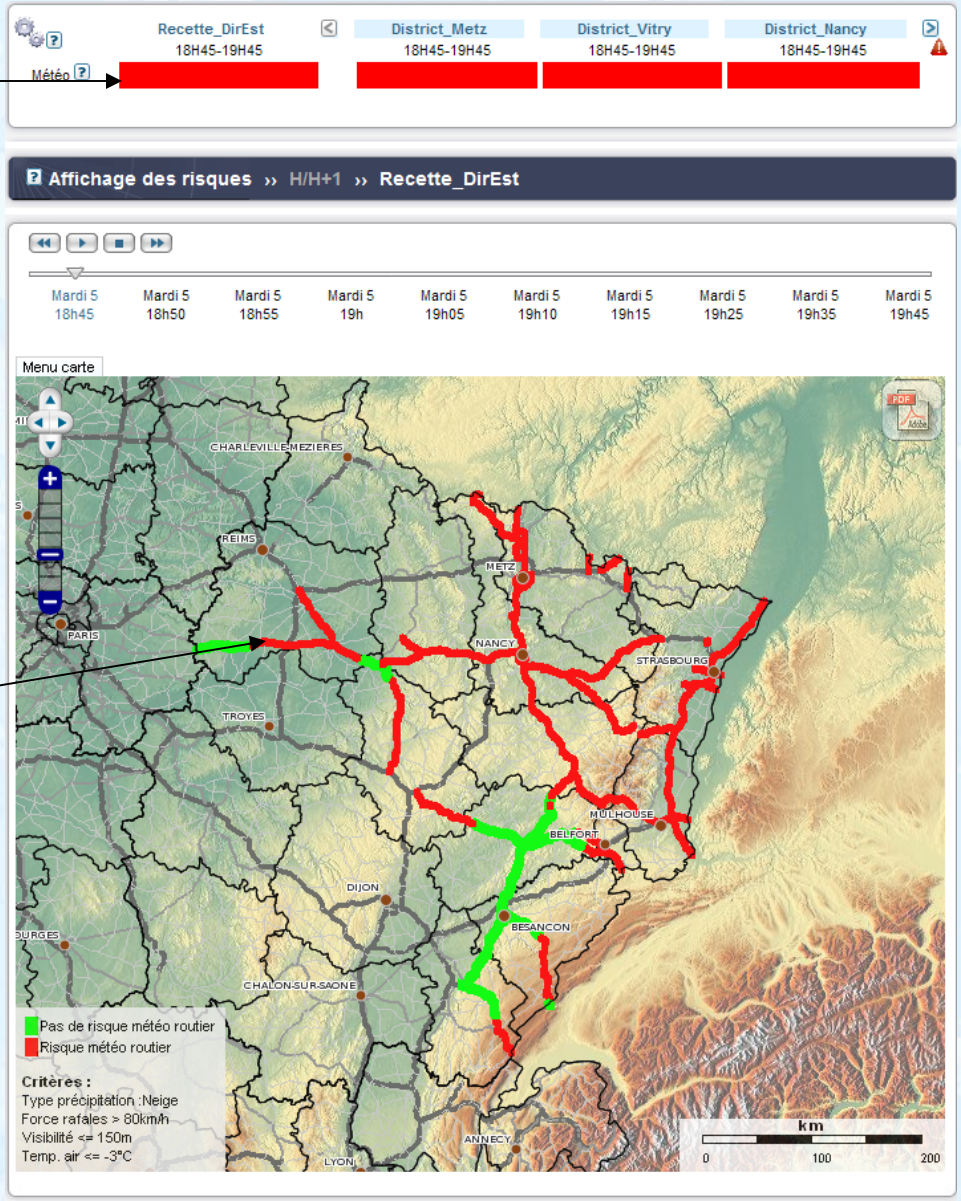
Optima : road weather risk

The alerts for each network



Risk :

- Green : no risk
- Red : risk

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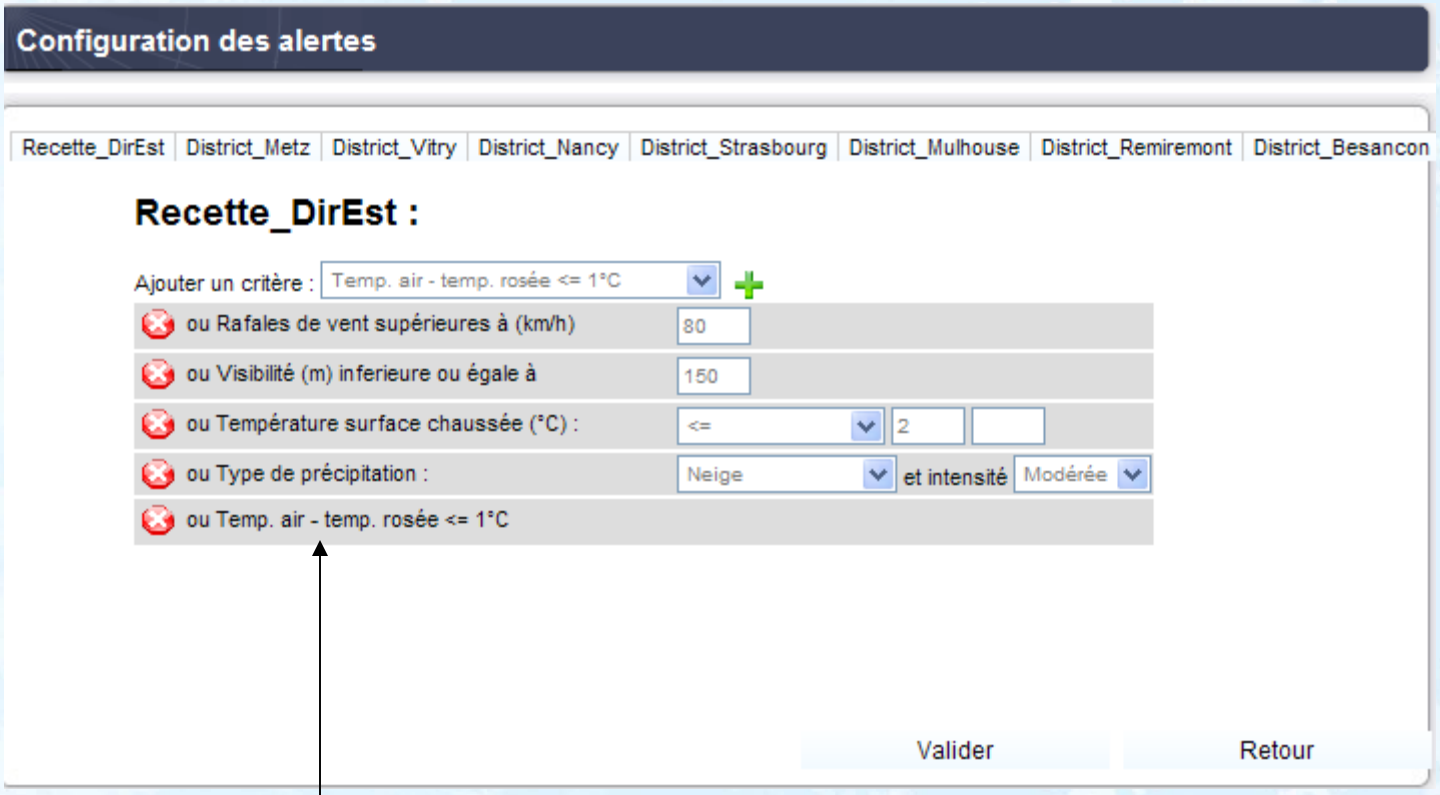
Optima : definition of the criteria of alert



The road manager define his own criteria of alert

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The follow-up of a snow event on France January 12 and 13th, 2010

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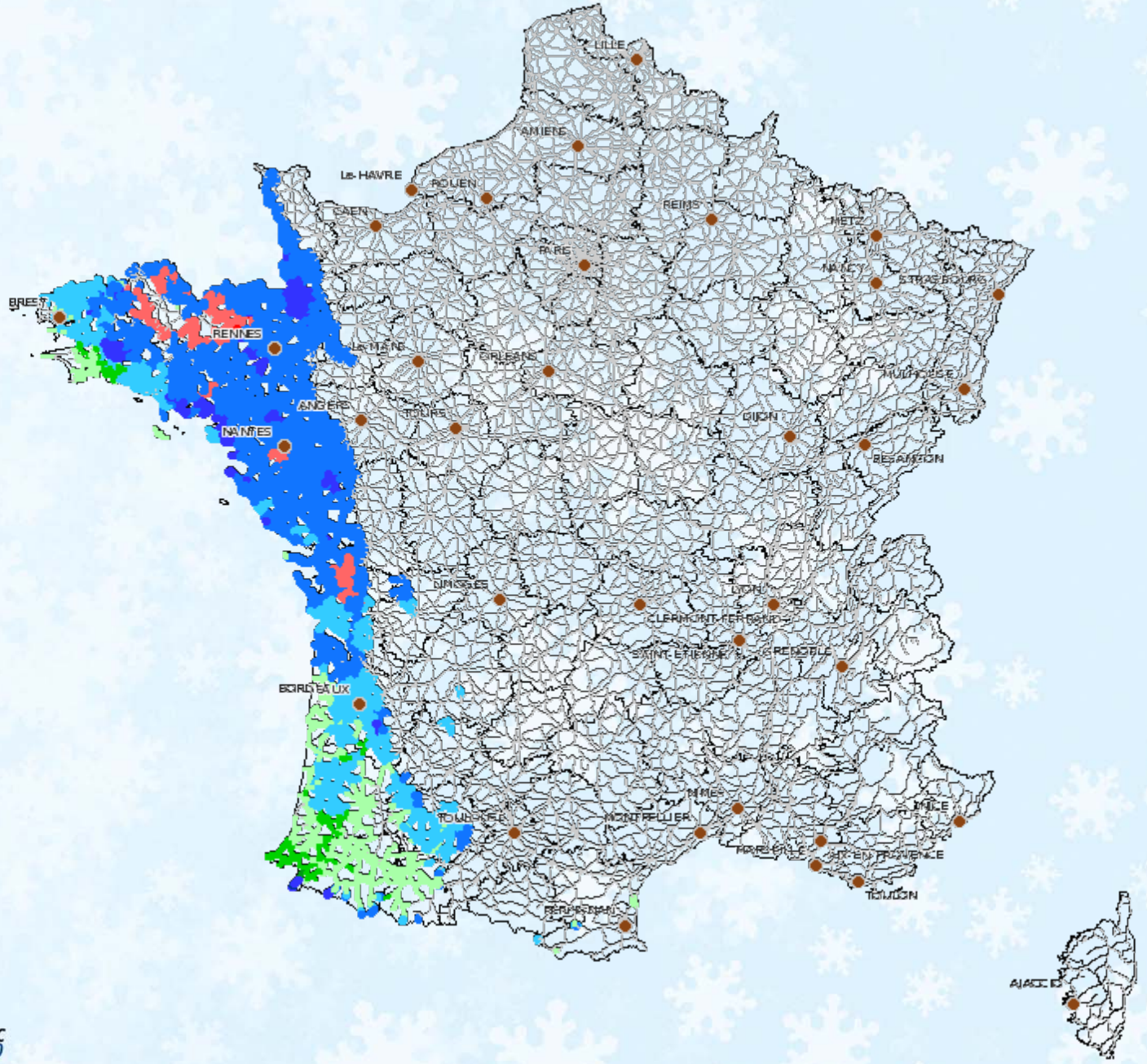
12/01/2010 at 14H20



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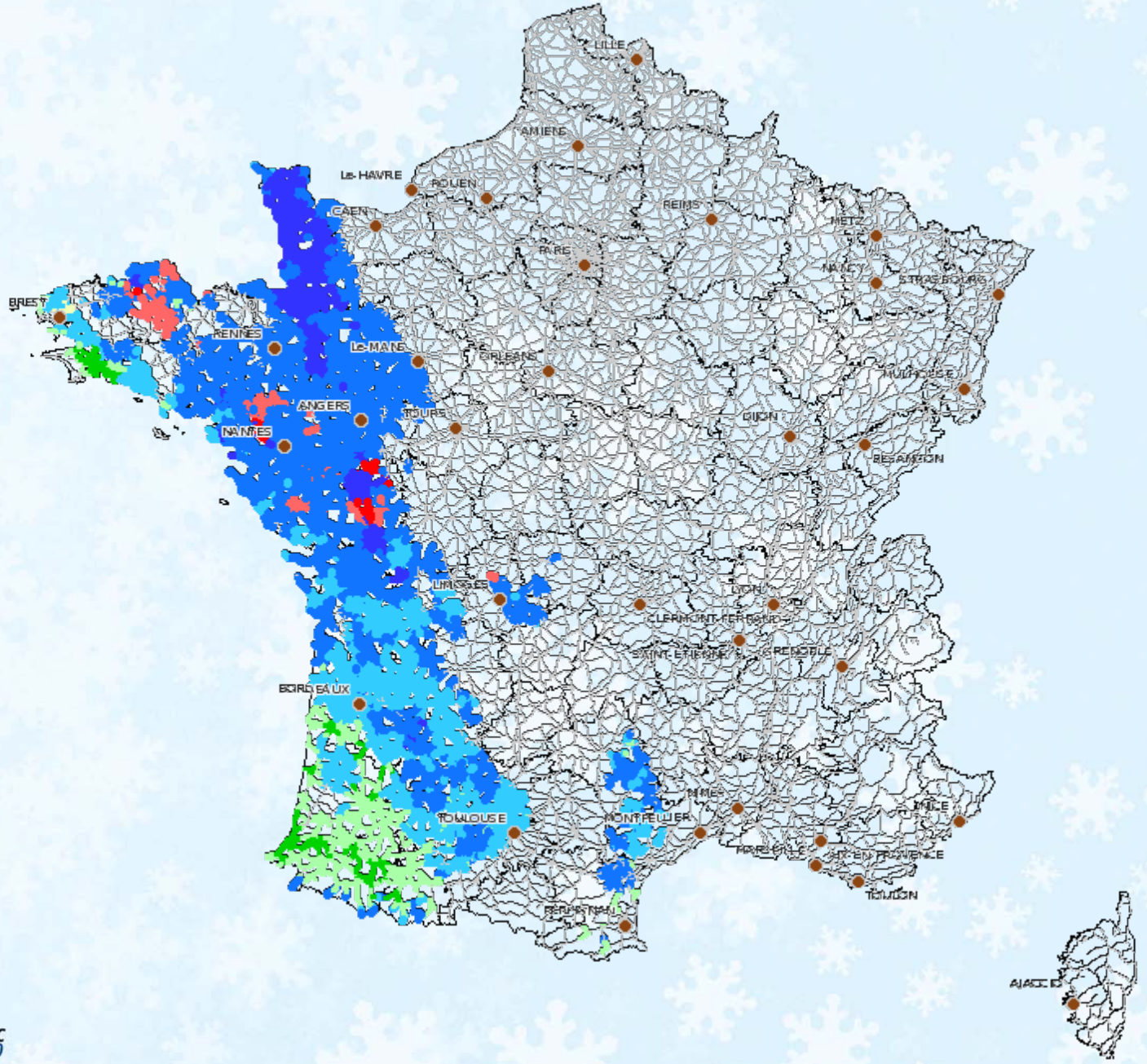
12/01/2010 at 15H20



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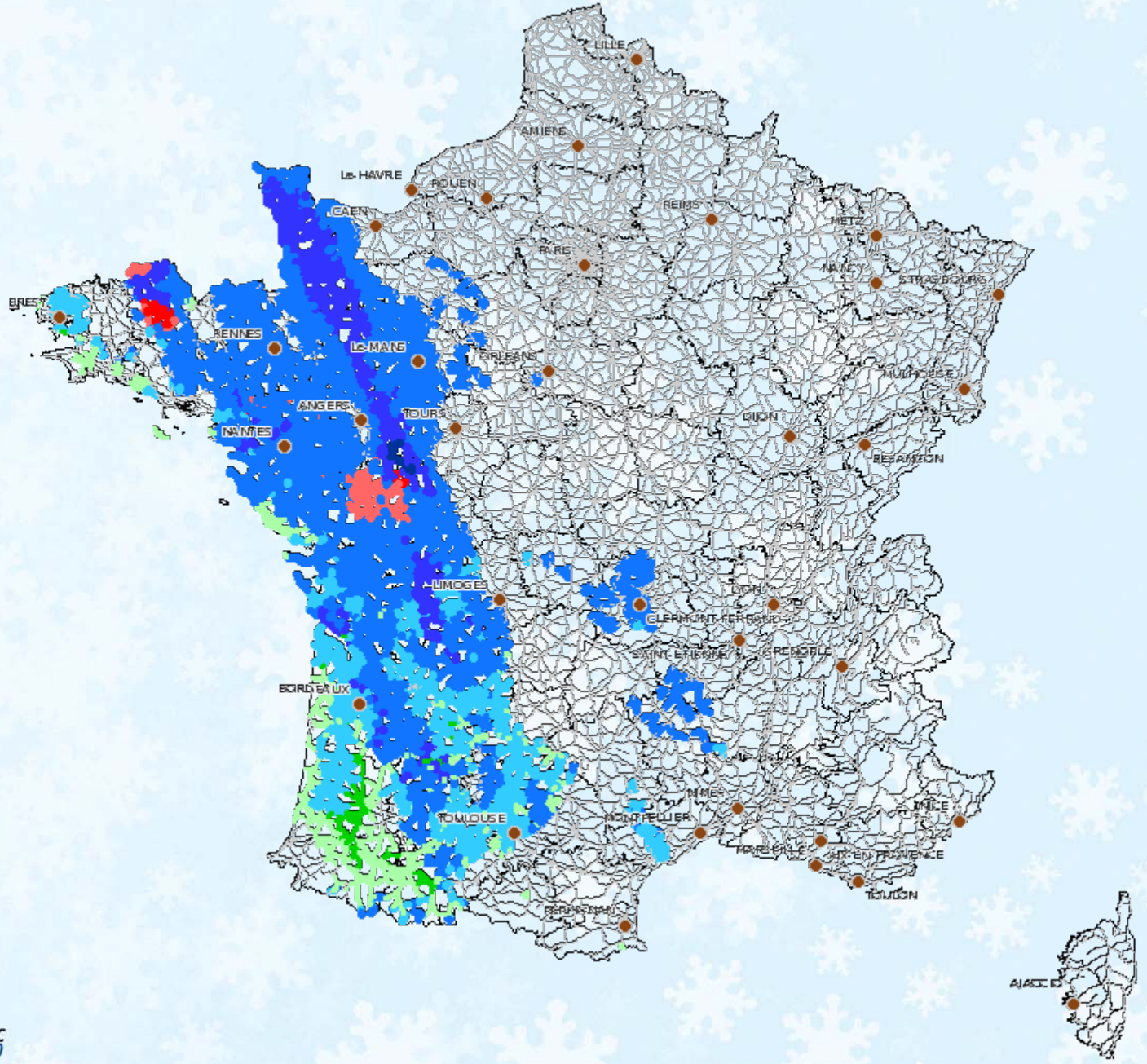

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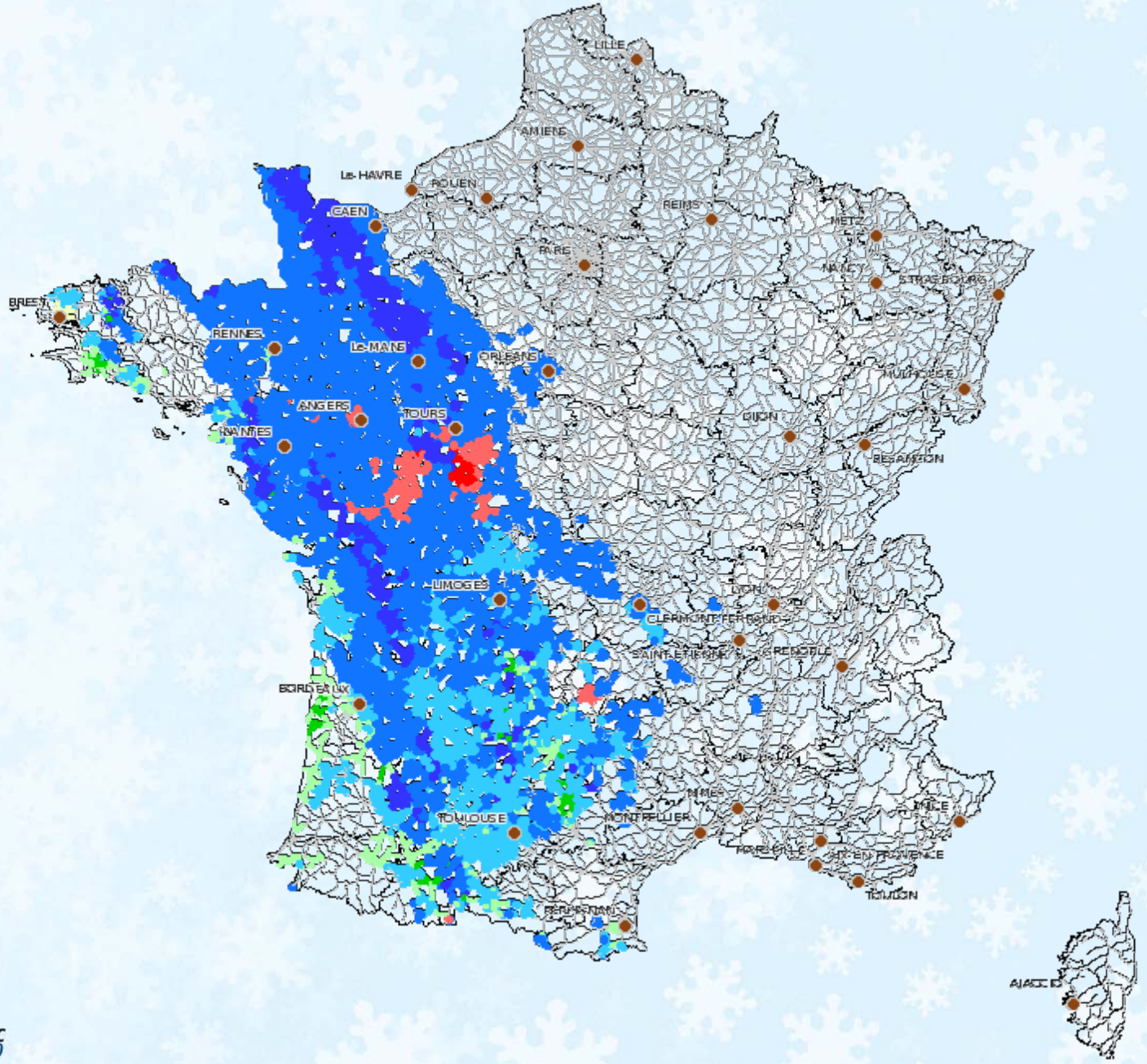
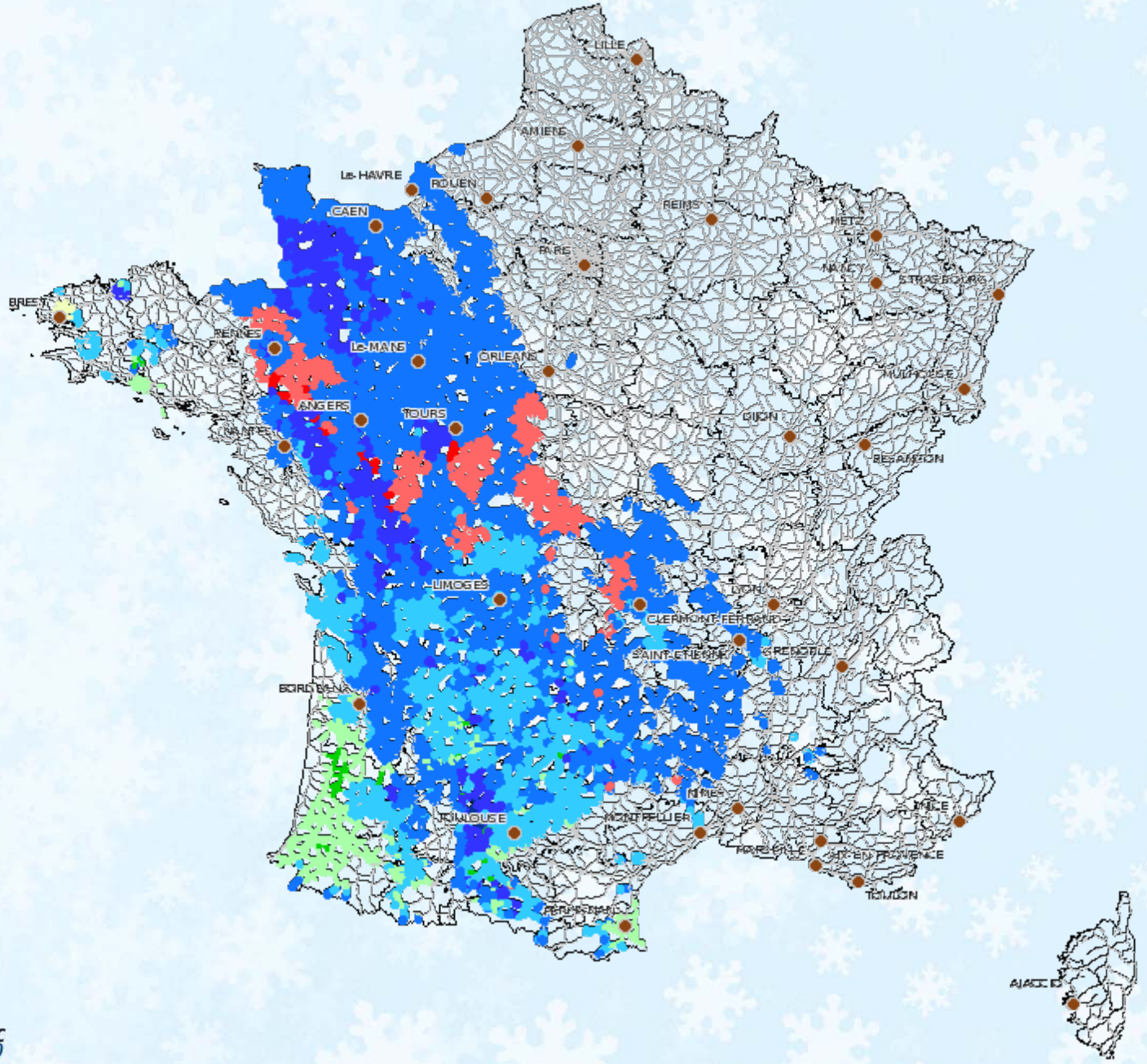
12/01/2010 at 17H20



12/01/2010 at 18H20



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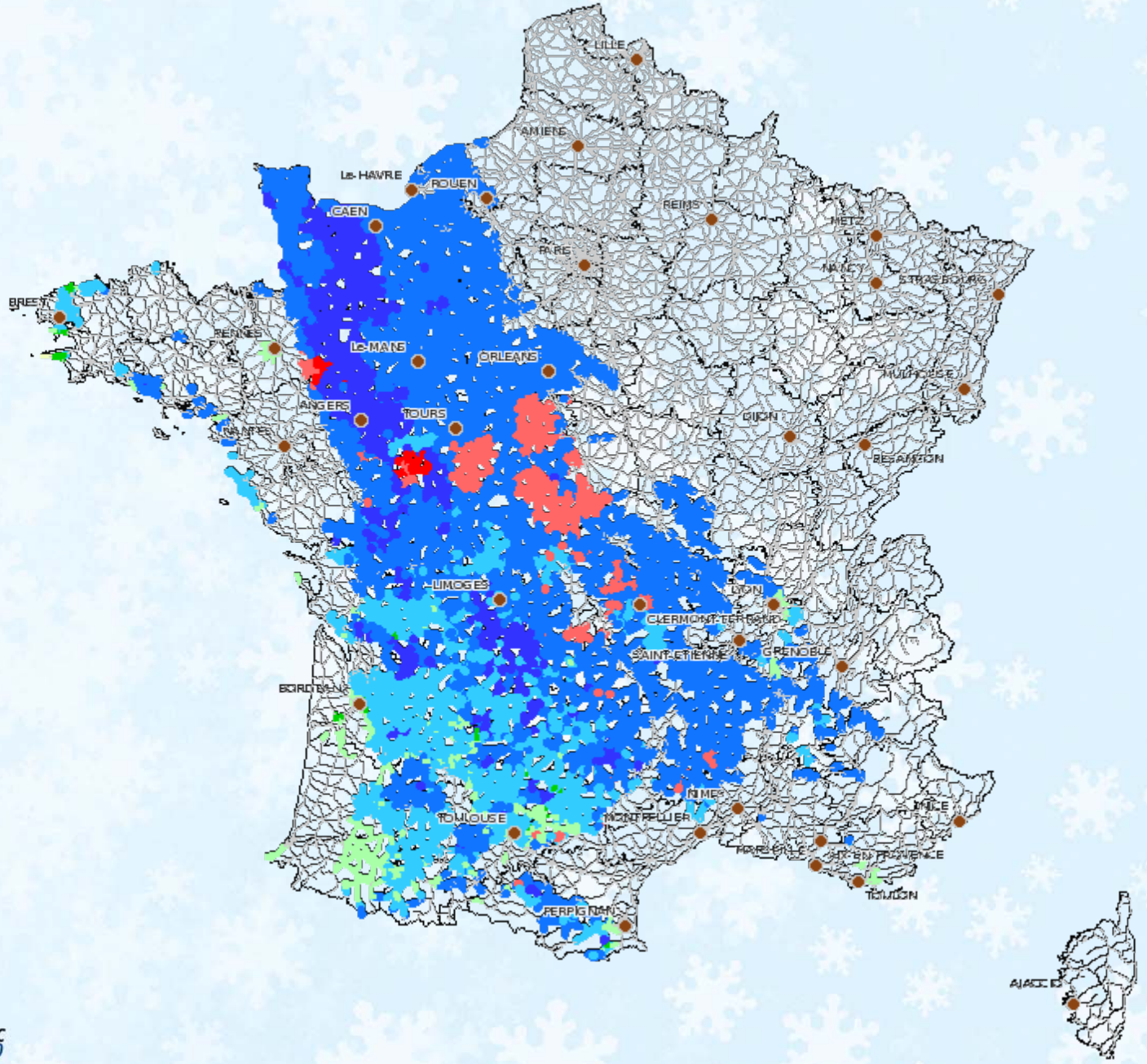
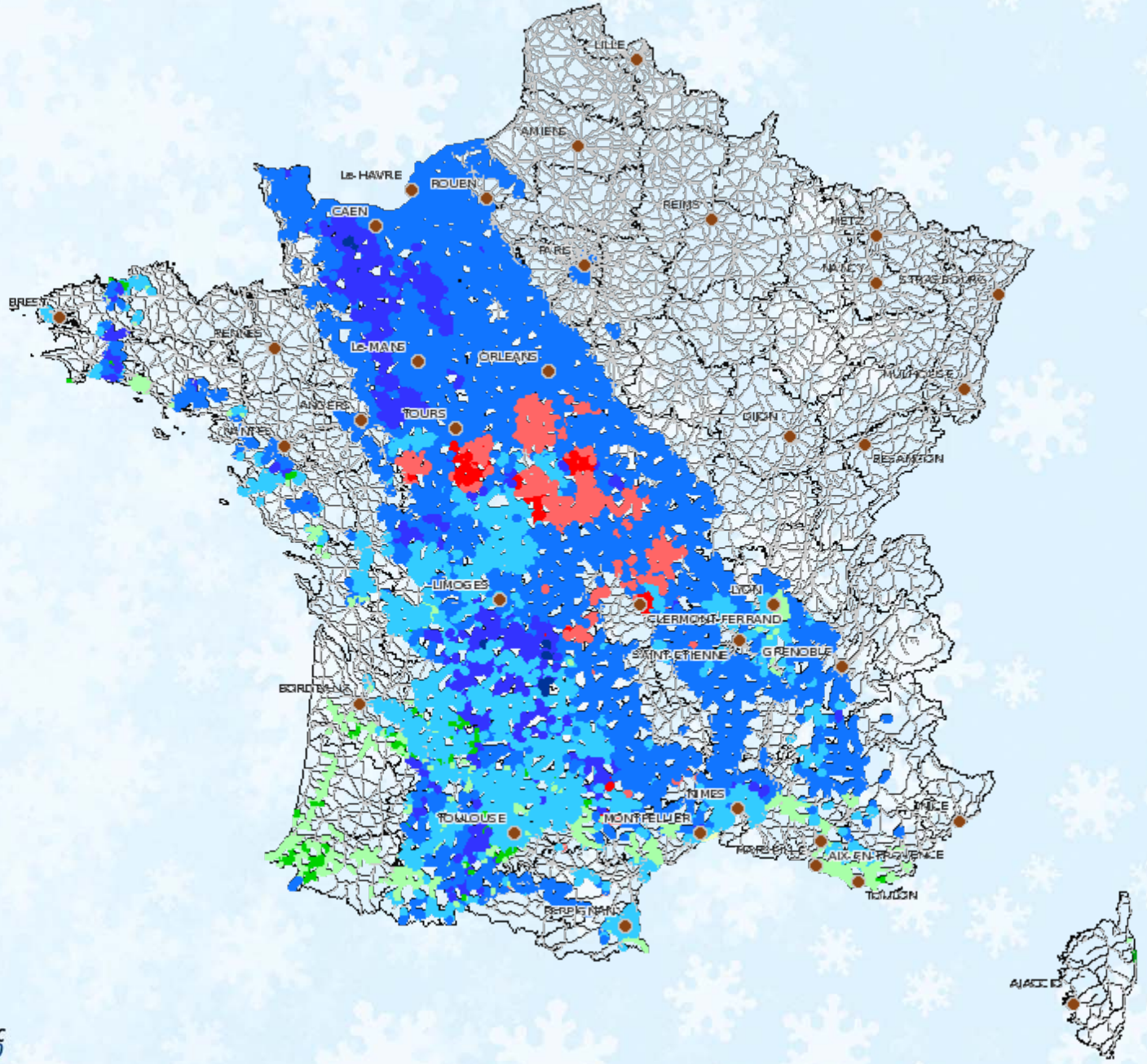
12/01/2010 at 19H20



12/01/2010 at 20H20



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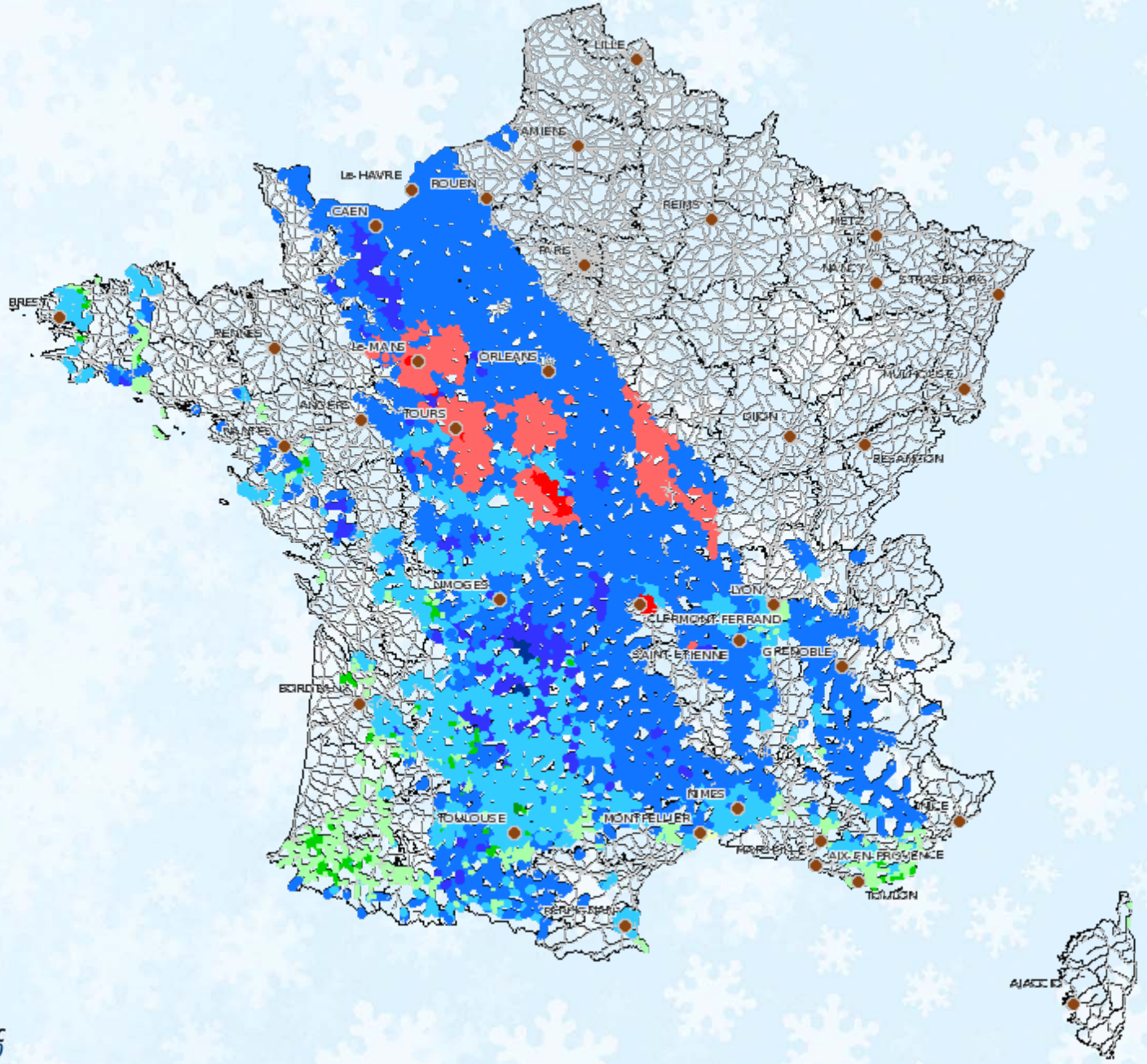
12/01/2010 at 20H50



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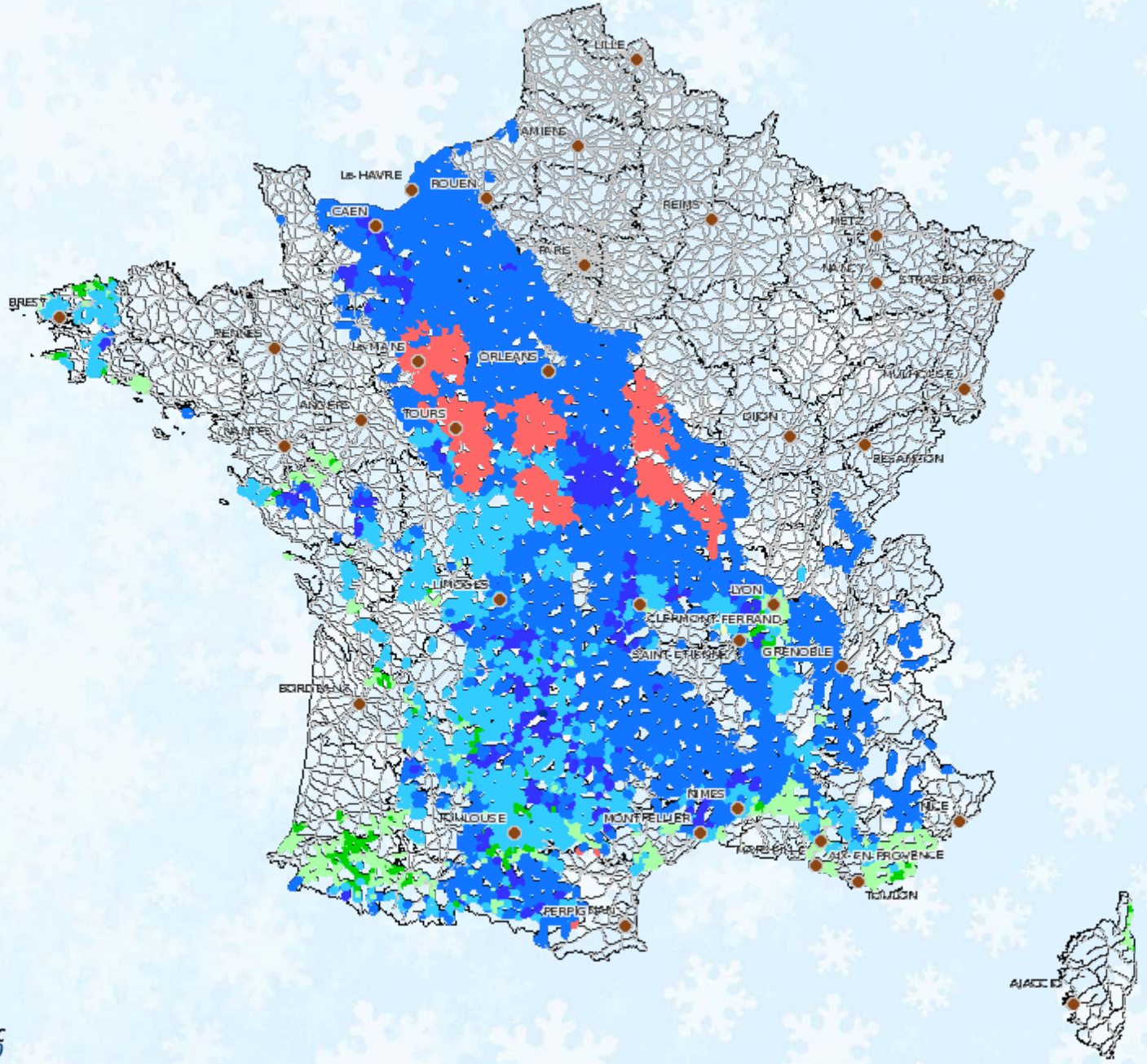
12/01/2010 at 21H20



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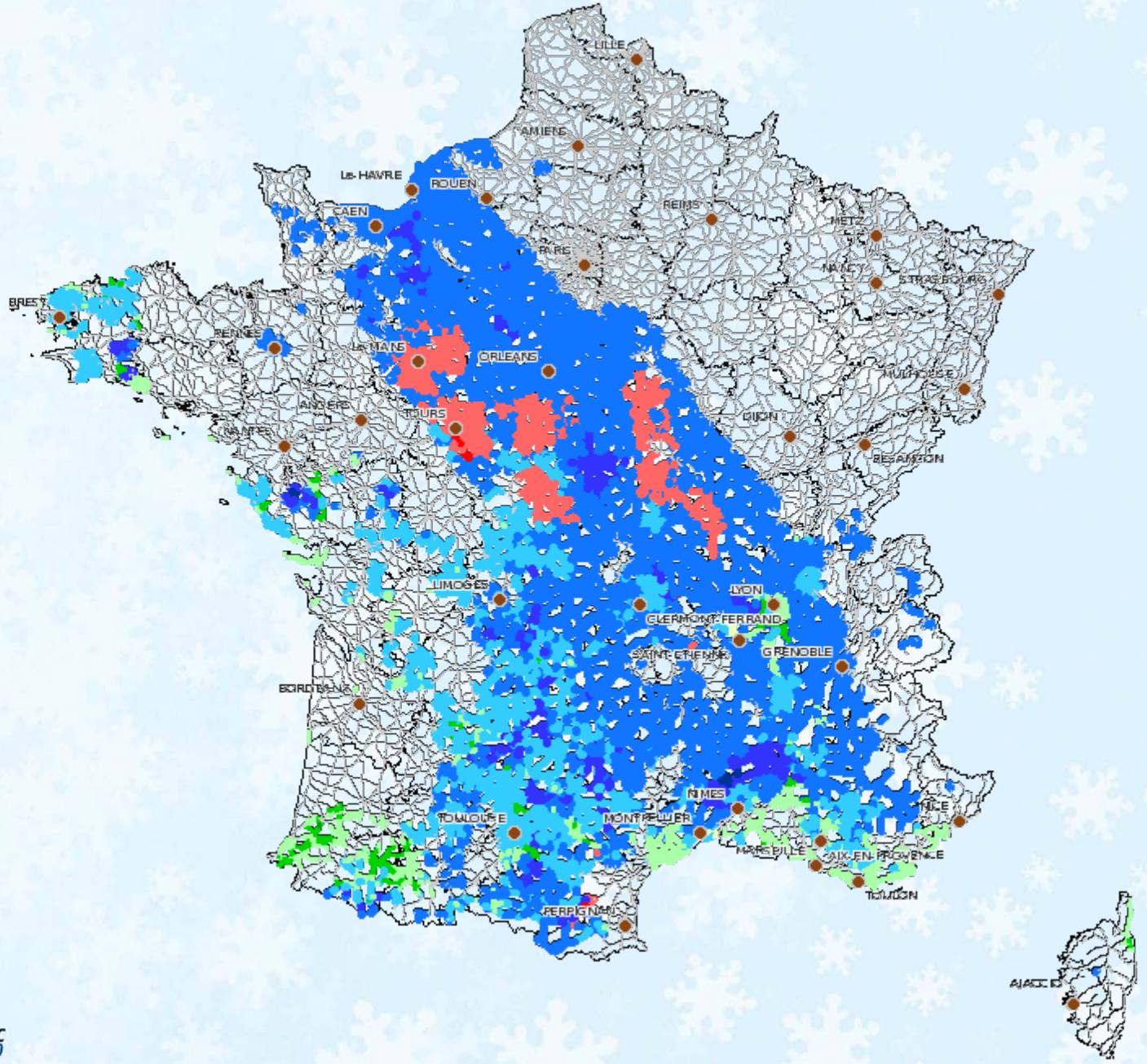
12/01/2010 at 21H50



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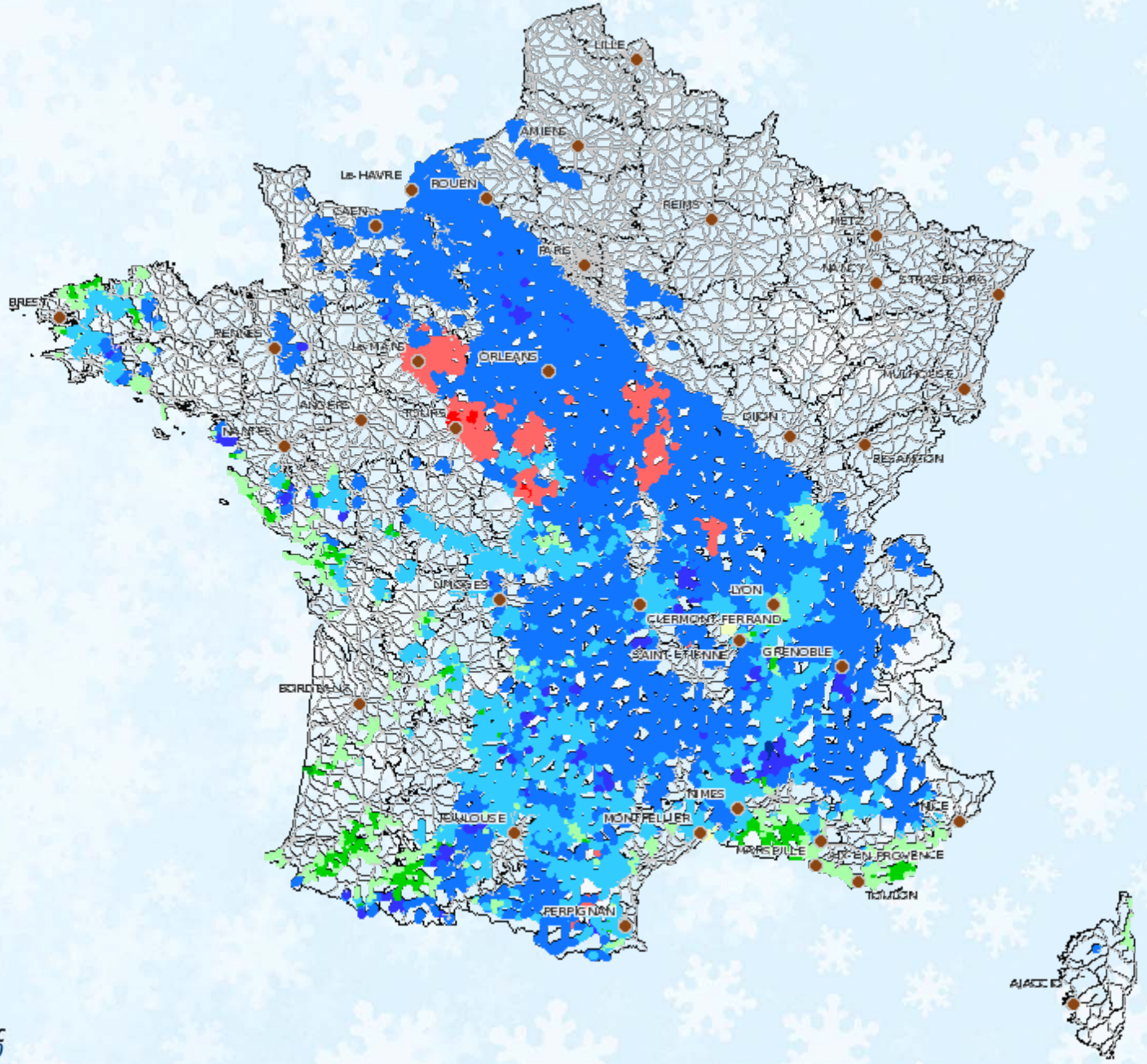
12/01/2010 at 22H20



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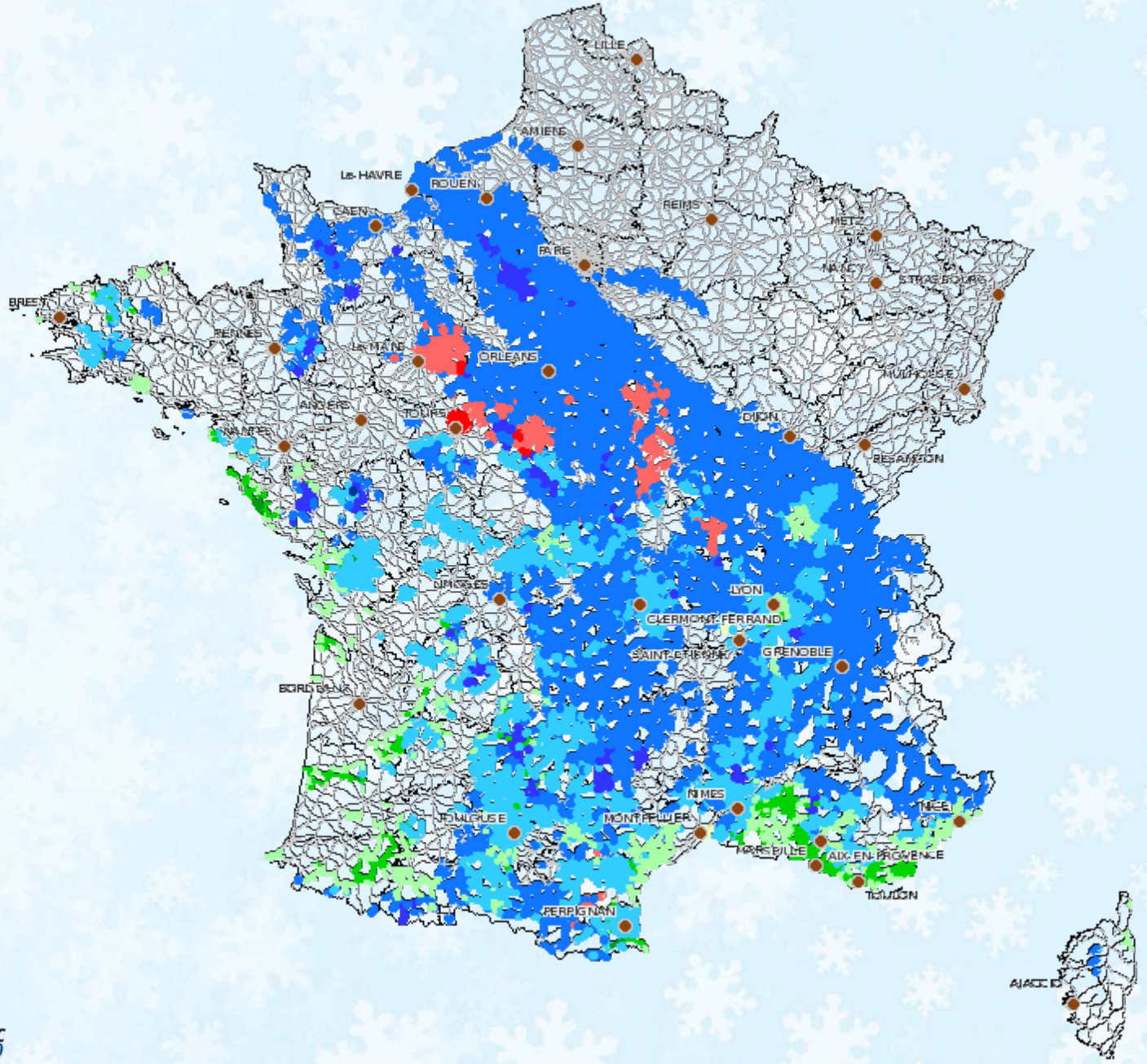

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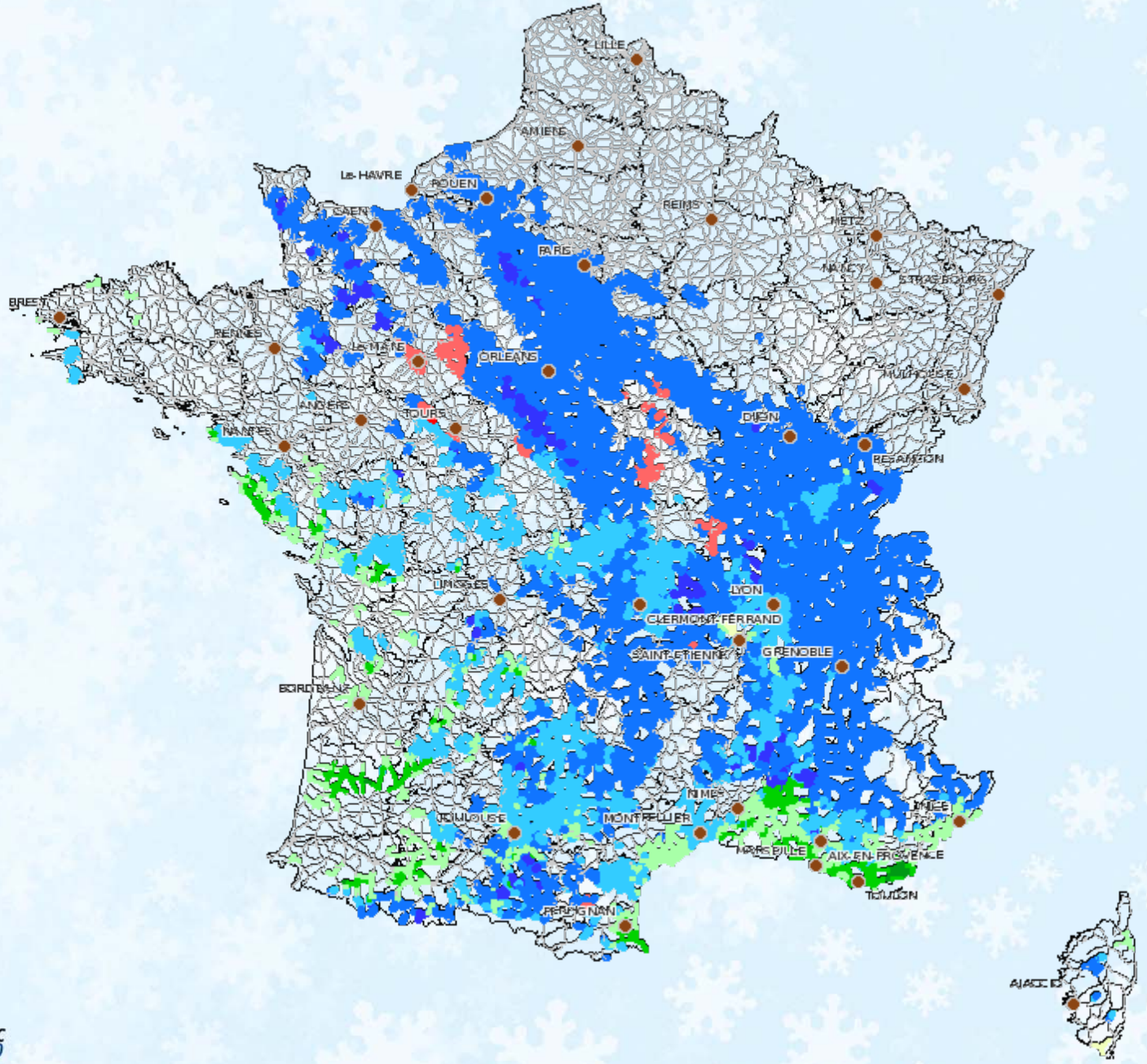
12/01/2010 at 23H20



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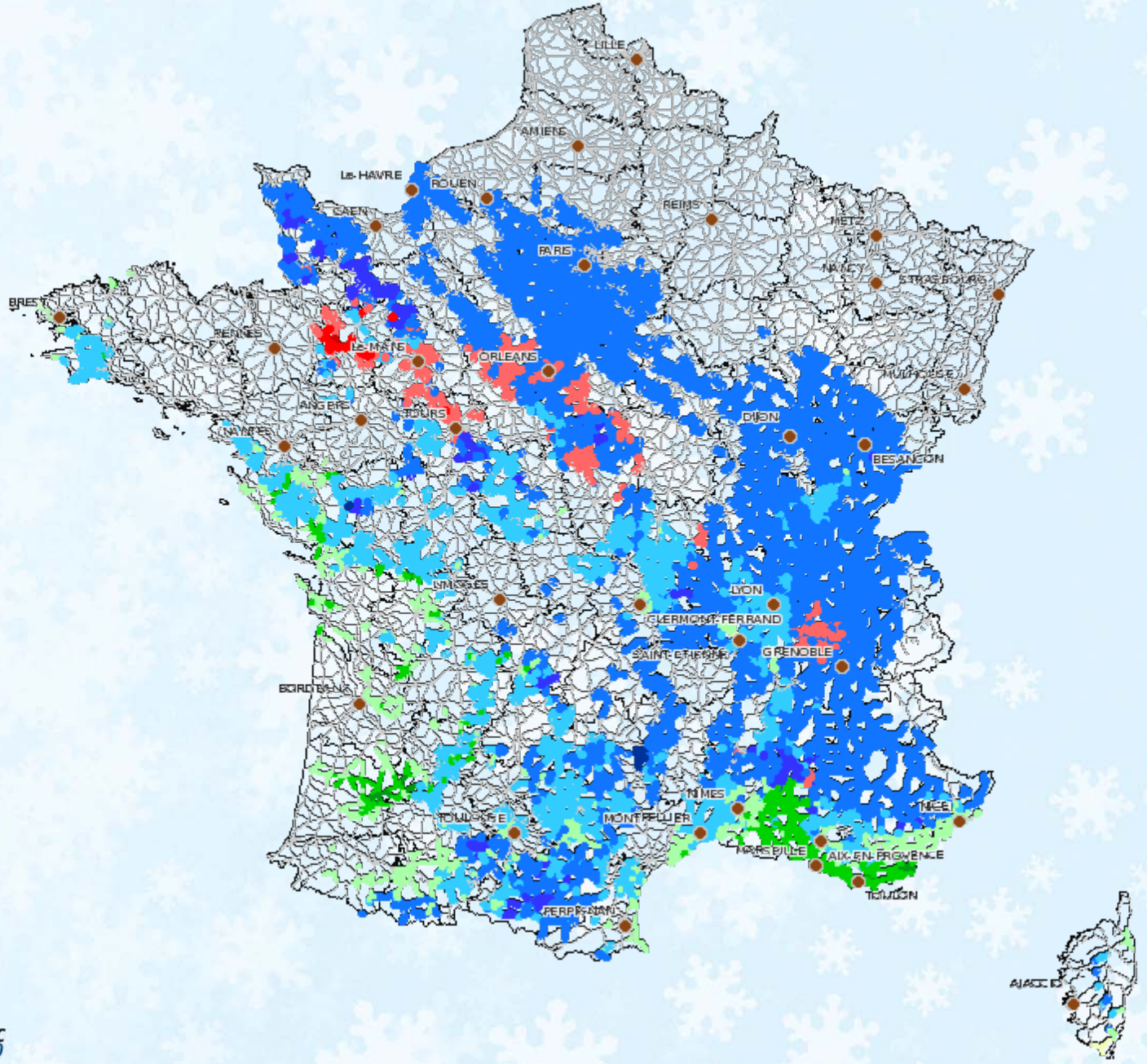
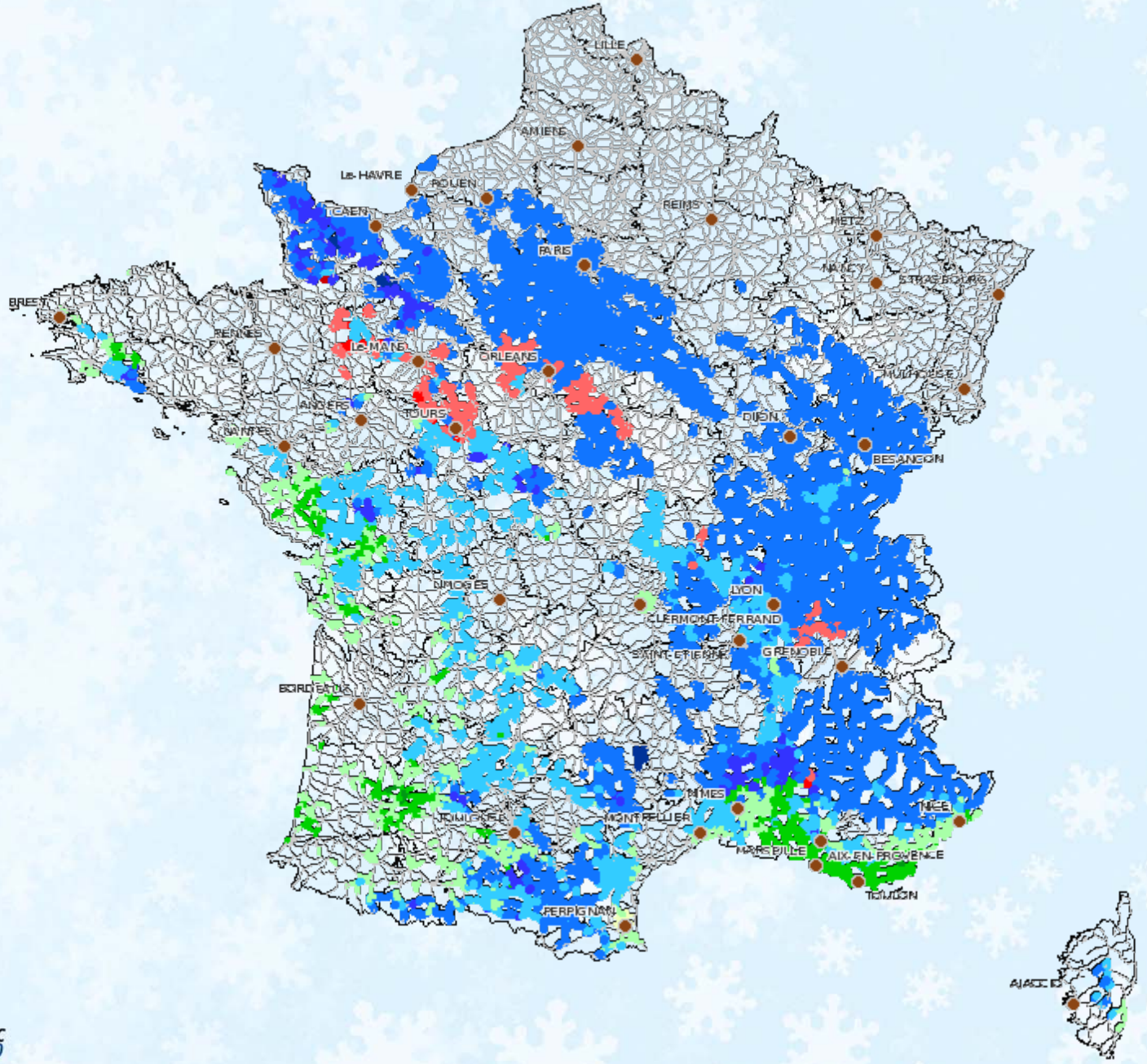
12/01/2010 at 23H50



13/01/2010 at 00H20



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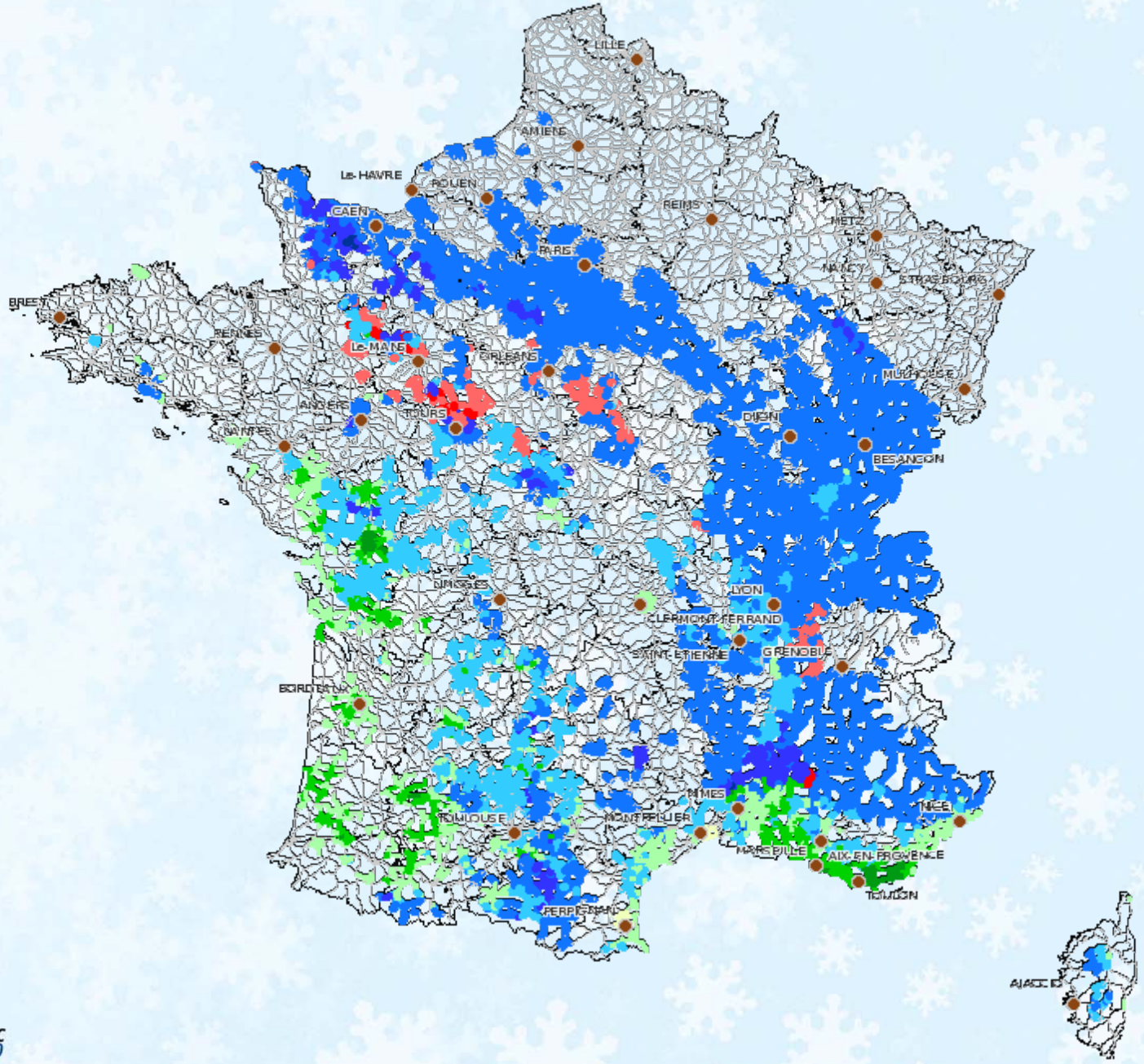
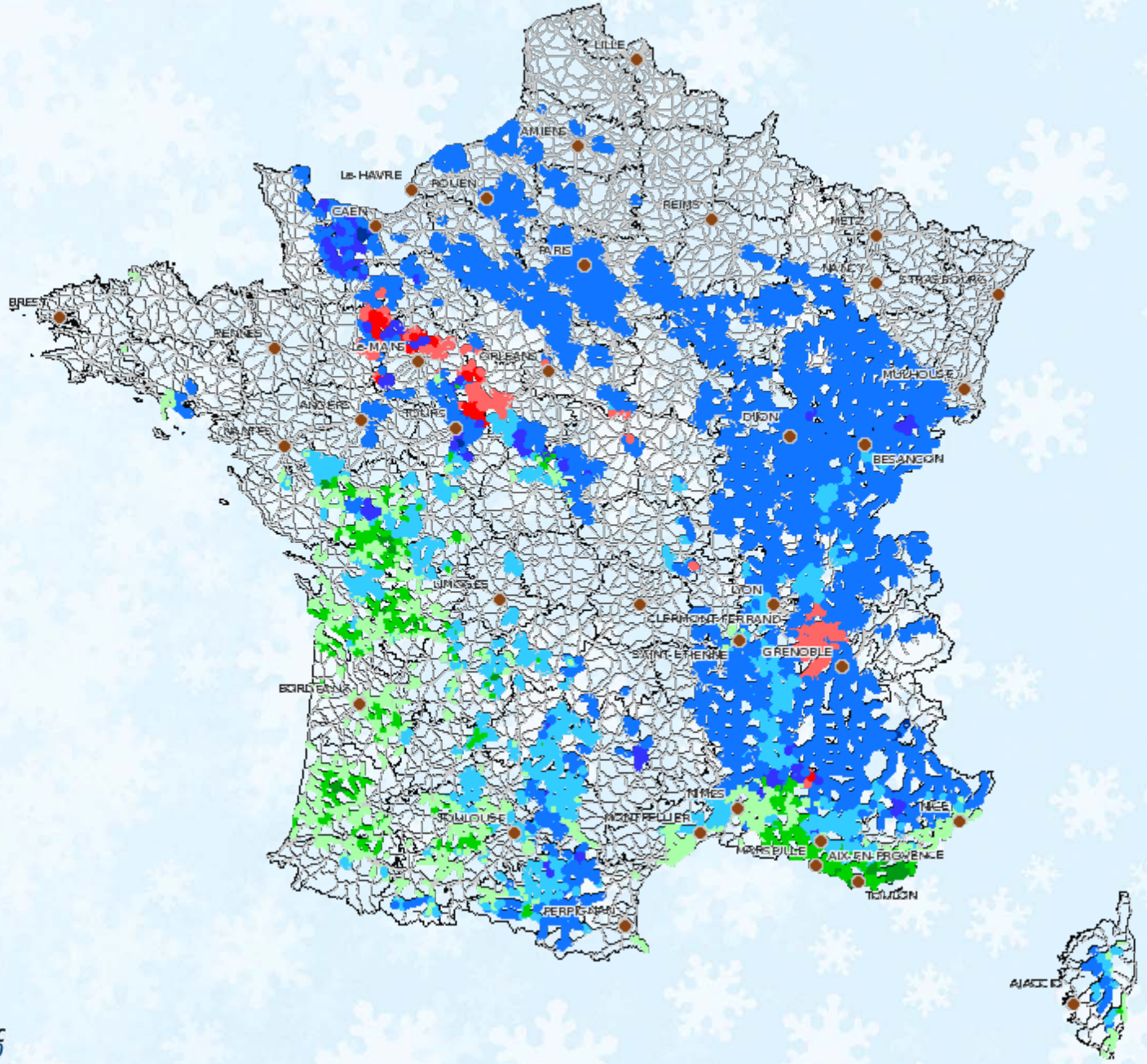


13/01/2010 at 01H20



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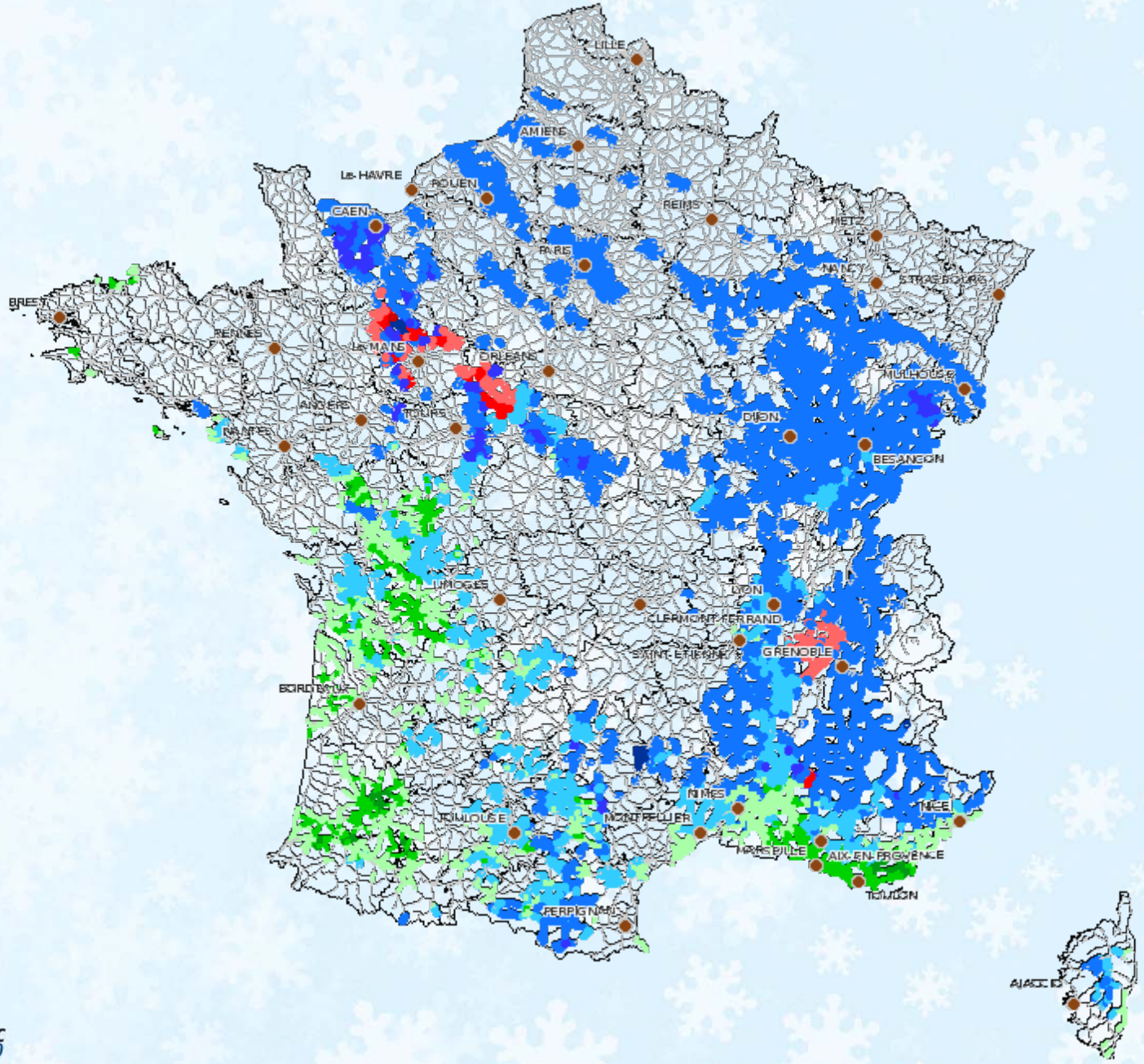

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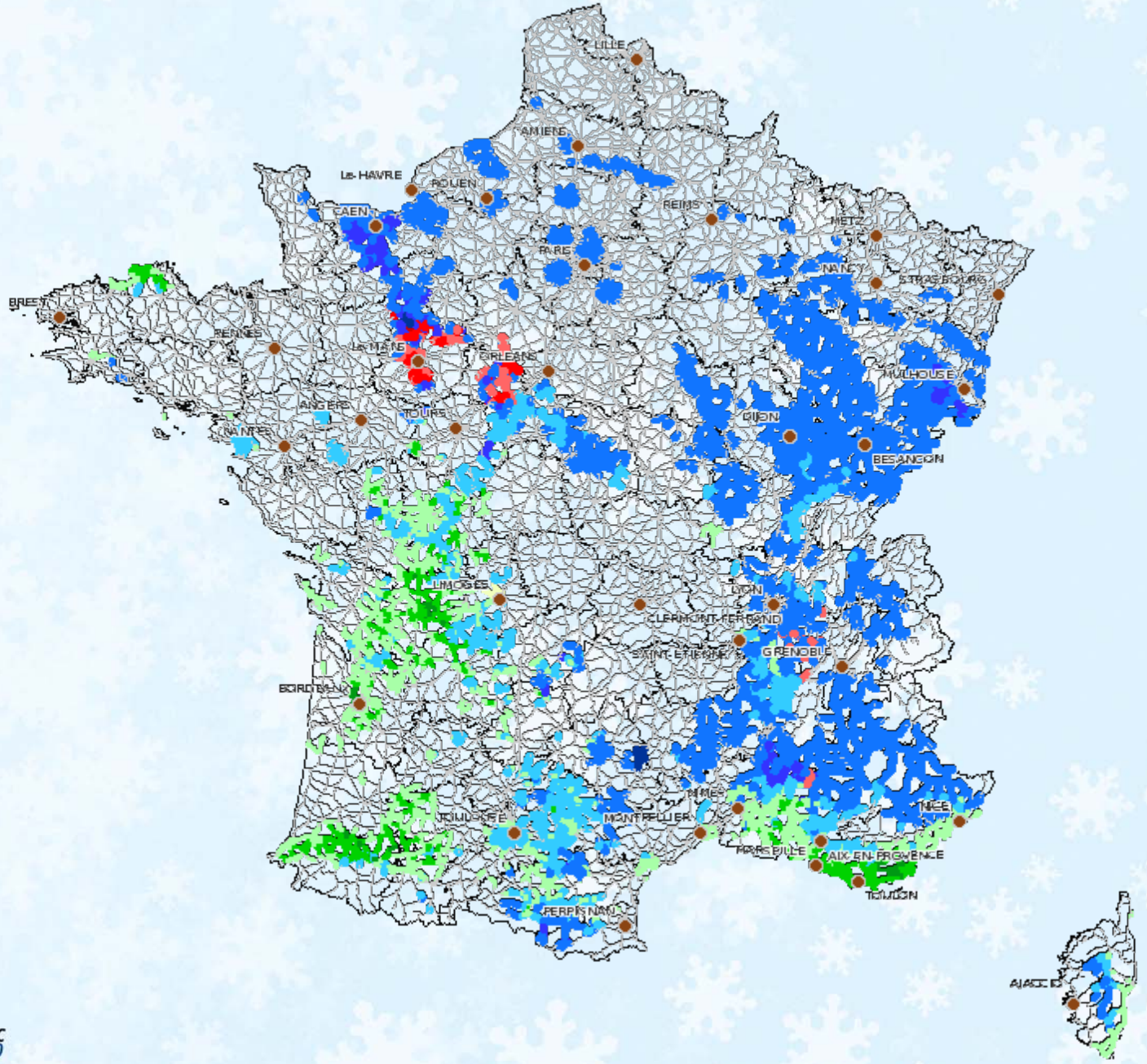

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Optima : conclusions

- 2008 : development of the treatments
- Winter 2008-2009 : evaluation
- 2009 : Production on dedicated extranets for road managers
- Winter 2009-2010 : OPTIMA available for all the major road customers

Optima : prospects

- 2010 :
– Consolidation
– Study of the extension to 500 000 km.

- >2010 :
– Algorithms and meta data improvements (Research with road laboratories) on the forecast of slipperiness
– Extension of the forecast range up to 2 or 3 hours, close to the state of the art
– Consideration of the environmental parameters of the road