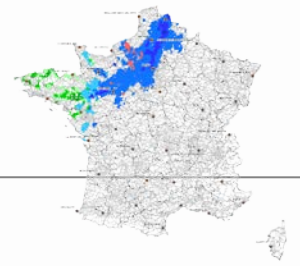


OPTIMA

Road weather informations dedicated to road sections

Odile Coudert, Ludovic Bouilloud
Pôle Route, Météo-France, Toulouse





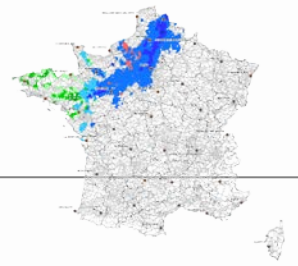
Optima's general presentation

The forecasted parameters visualisation

The road weather risk interface in Optima

The following of a snow event in France

Conclusions

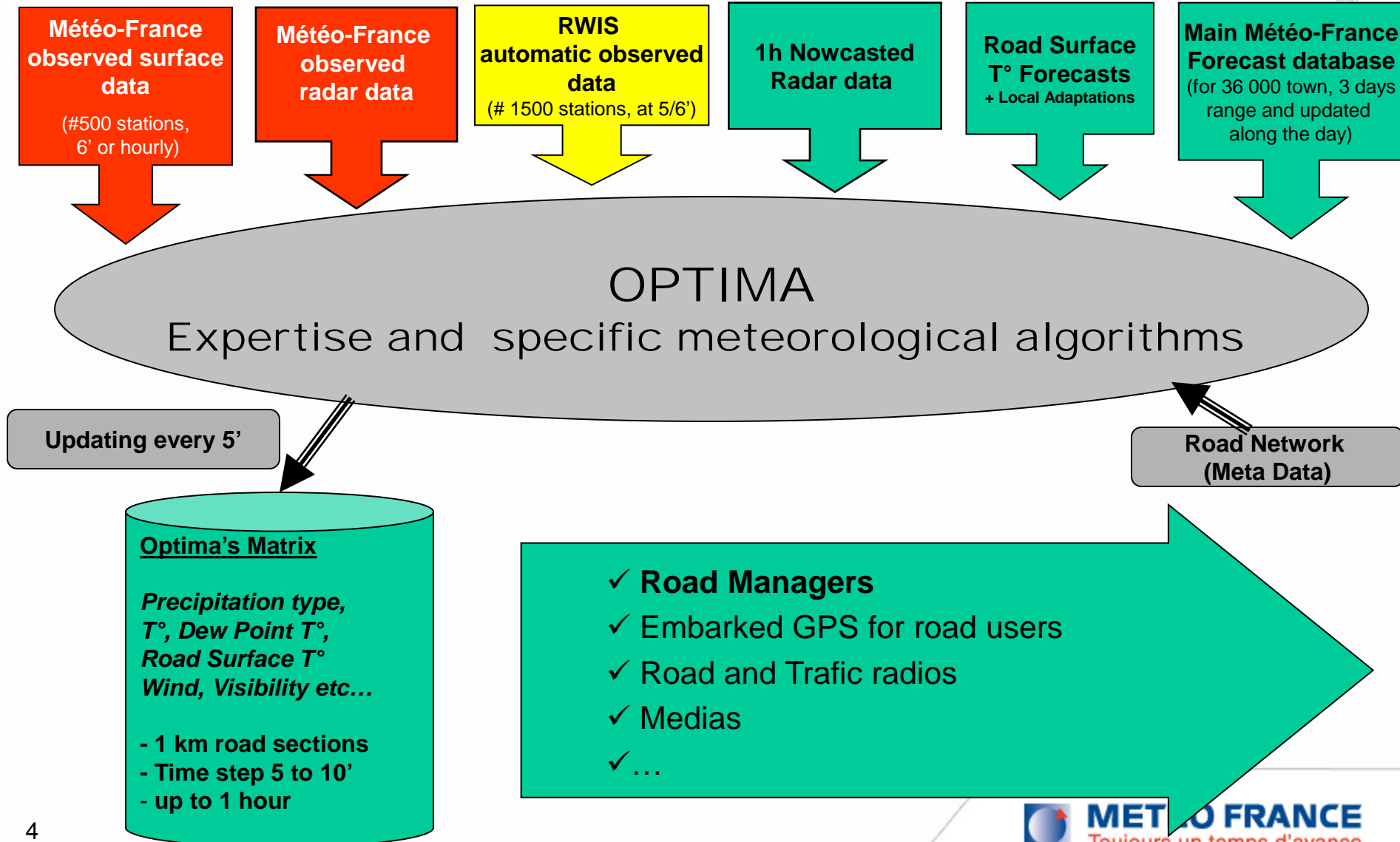
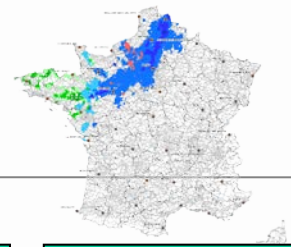


OPTIMA (Road weather informations dedicated to road sections), is a global approach of data fusion and specific road weather algorithms implementation, to obtain the best road weather information, according to the state of art, at 1 km resolution, on the road network.

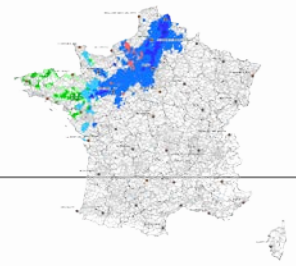
OPTIMA is a 1h nowcasting application of data fusion: link between in-situ reality and forecast

In 2012, 500 000 km of the french road network are covered.

OPTIMA : Synthetic diagram



Forecasted parameters in OPTIMA



Precipitation : Freezing Rain, Snow, Sleet, Hail, Rain, Drizzle.

Precipitation intensity: light, moderate or heavy.

Snow : Snow quality (density, water content...) and snow potential (i.e. potential height on the ground without accounting for melting effects)

Air and dew point Temperature

Road Surface Temperature

Altitude of the Rain/Snow transition

Wind and squalls

Visibility

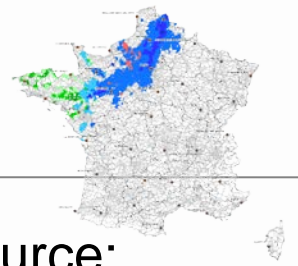
Thunderstorms

Road surface condition

Snow height

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

Optima : the treatments

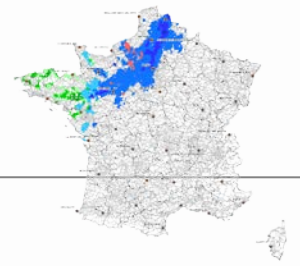


First step : Forecast initialization with the best available data source:

- Extrapolated radar data for precipitations
- Numerical model prediction for road surface temperature
- Meteo-France forecasts data base for other parameters

Second step : Precipitation type discrimination with specific algorithm

Last step : Forcecast updating with available observations
(Specific algorithms for each parameter)



Optima's general presentation

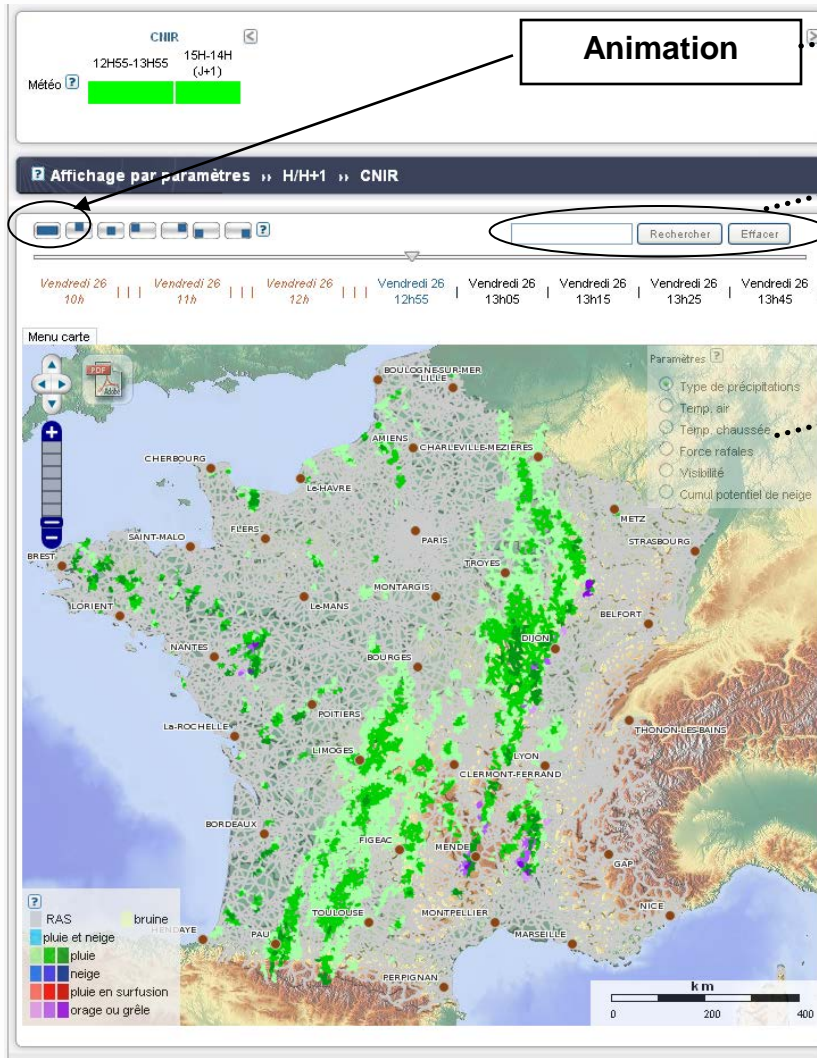
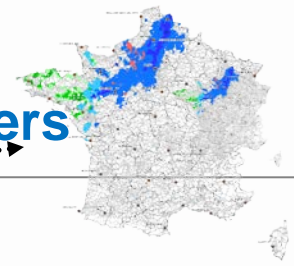
The forecasted parameters visualisation

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Optima : Visualisation of forecasted parameters

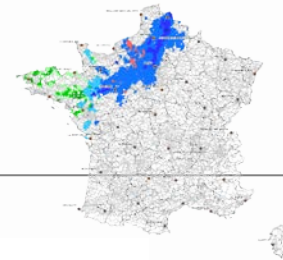


Animation

To look for or underline a specific road

- Allow the user to follow the real time and nowcasted precipitation type.
- Or other considered parameters : Tair, RST, squalls, visibility and snow potential.
- Synthetic information by colourisation of road sections.
- Global information on France and possibility of zooming selected areas
- 3 hours of past observations and 1 hour of forecasted data.
- More **detailed informations** on each road section for all forecasted time-step :
 - Tooltip (detailed text information)
 - Syntetic arrays
 - Temperatures (Ta,Td,Ts) evolution graphical representation

Detailed informations



Array

		11:00	11:15	11:30	11:45	12:00	12:15	12:30	13:00	13:15	13:30	13:45	14:00	14:05	14:10	14:15	14:20	14:25
Précipitations		///	///	///	RAS	///	///	RAS	///	///	///	///	Gr _f	Gr _f	Gr _f	///	///	///
Intensité des précipitations	Sup. à 7.2 mm/h	Entre 2.4 et 7.2 mm/h	Entre 2.4 et 7.2 mm/h	-	Sup. à 7.2 mm/h	Entre 2.4 et 7.2 mm/h	-	Entre 2.4 et 7.2 mm/h	Sup. à 7.2 mm/h	Sup. à 7.2 mm/h	Sup. à 7.2 mm/h	Sup. à 7.2 mm/h	-	-	-	Sup. à 7.2 mm/h	Sup. à 7.2 mm/h	Sup. à 7.2 mm/h
Température de chaussée	20.3 *	20.3 *	20.3 *	20.3 *	20.3 *	20.3 *	20.1 *	20.1 *	20.1 *	20.1 *	20.1 *	20.1 *	20.1 *	20.1 *	20.1 *	20.1 *	20 *	20 *
Température de l'air	15.3 *	16.9 *	16 *	16.9 *	16.8 *	17.1 *	17.5 *	16 *	17.4 *	17.4 *	18.1 *	18.3 *	18.3 *	18.3 *	18.3 *	18.3 *	18.3 *	18.3 *
Température point de rosée	14.1 *	16.3 *	14.8 *	16.4 *	16.3 *	16.6 *	17 *	15 *	16.9 *	16.9 *	17.8 *	17.8 *	17.8 *	17.7 *	17.7 *	17.7 *	17.6 *	17.6 *
Limite Pluie Neige	2400 m	2600 m	2500 m	2600 m	2600 m	2700 m	2700 m	2500 m	2700 m	2700 m	2800 m	2900 m	2900 m	2900 m	2900 m	2900 m	2900 m	2900 m
Vent	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h	Sud - 18 km/h
Rafales	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Visibilité	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m	>200 m

Graph



Graph

Affichage par paramètres » H/H+1 » CNIR

Vendredi 26 10h, Vendredi 26 11h, Vendredi 26 12h, Vendredi 26 12h55, Vendredi 26 13h05, Vendredi 26 13h15, Vendredi 26 13h25, Vendredi 26 13h45

Menu carte

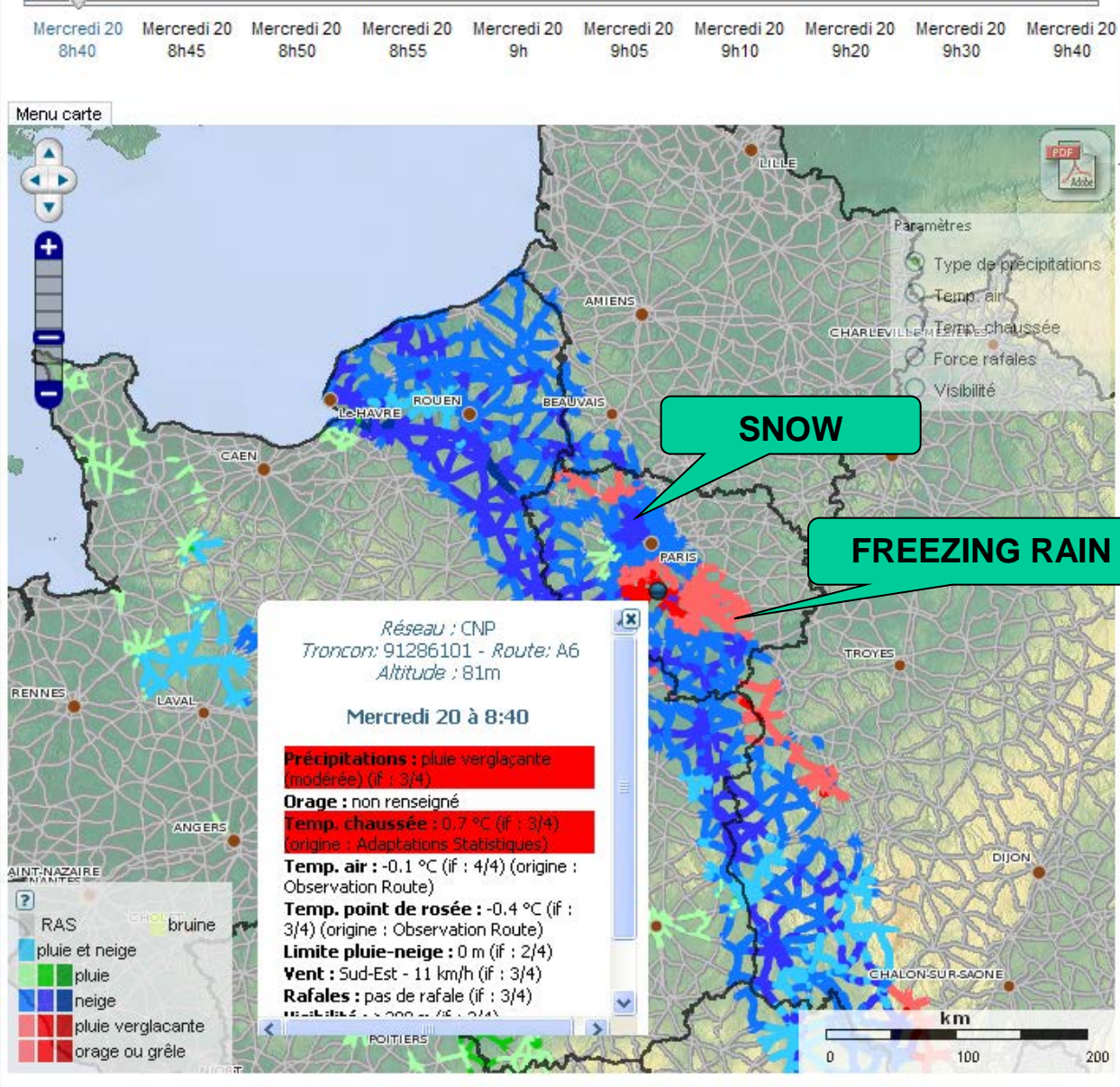
Réseau : CNIR
Tronçon: 21677103 - Router: D33
Altitude : 395m

Vendredi 26 à 12:55

Précipitations : pluie (forte) (f : 4/4)
Orage modéré (f : 2/4)
Temp. chaussée : 18.7 °C (f : 1/4)
Temp. air : 14.7 °C (f : 3/4) (origine : Observation M.F)
Temp. point de rosée : 14.7 °C (f : 2/4) (origine : Observation M.F)
Limite pluie-neige : 2500 m (f : 2/4)
Vent : Ouest - 18 km/h (f : 3/4)
Rafales : pas de rafale (f : 3/4)
Visibilité : >200 m (f : 2/4)

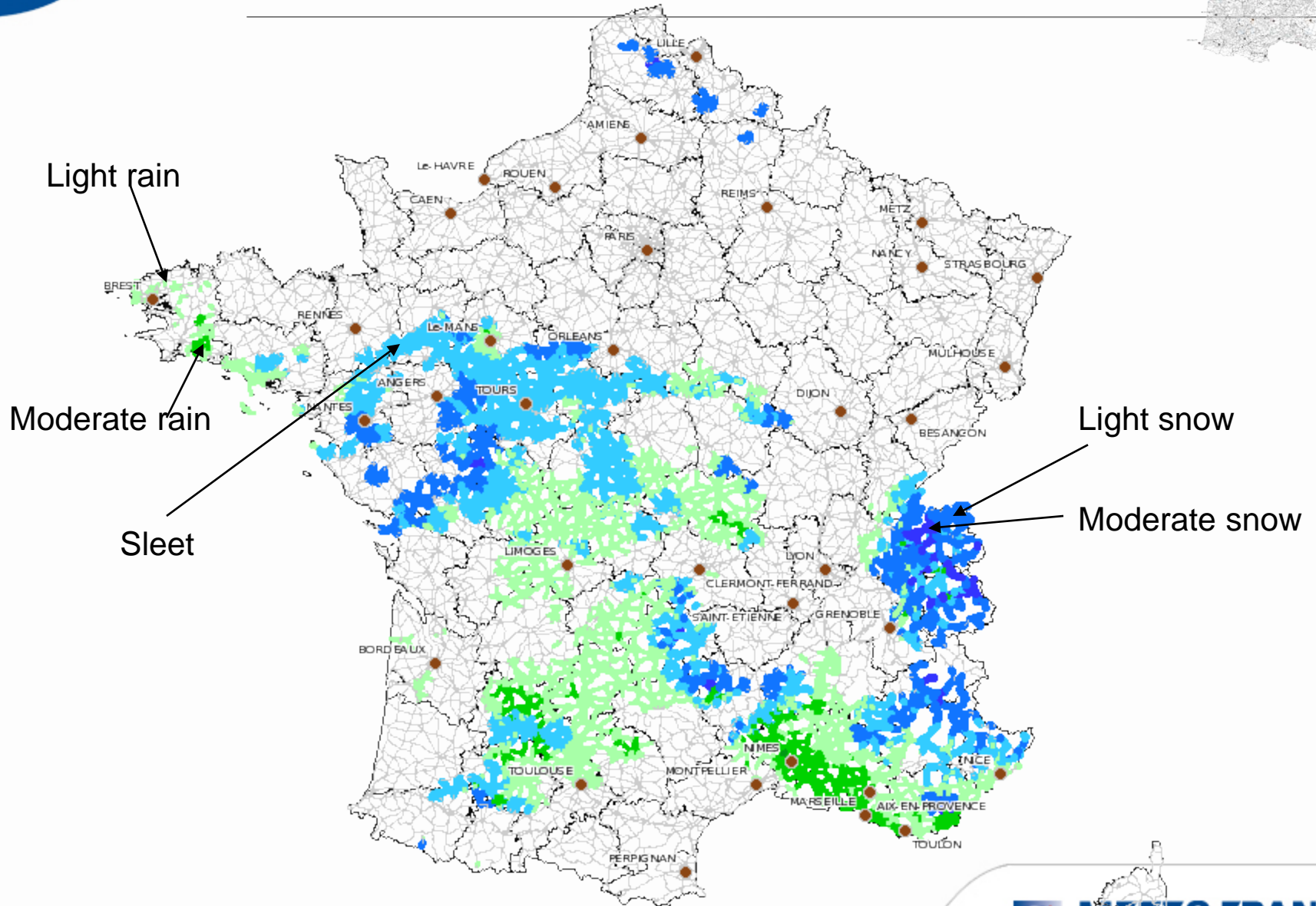
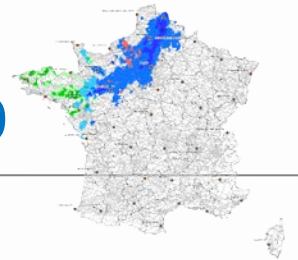
Atmogramme - Graph

Tooltip

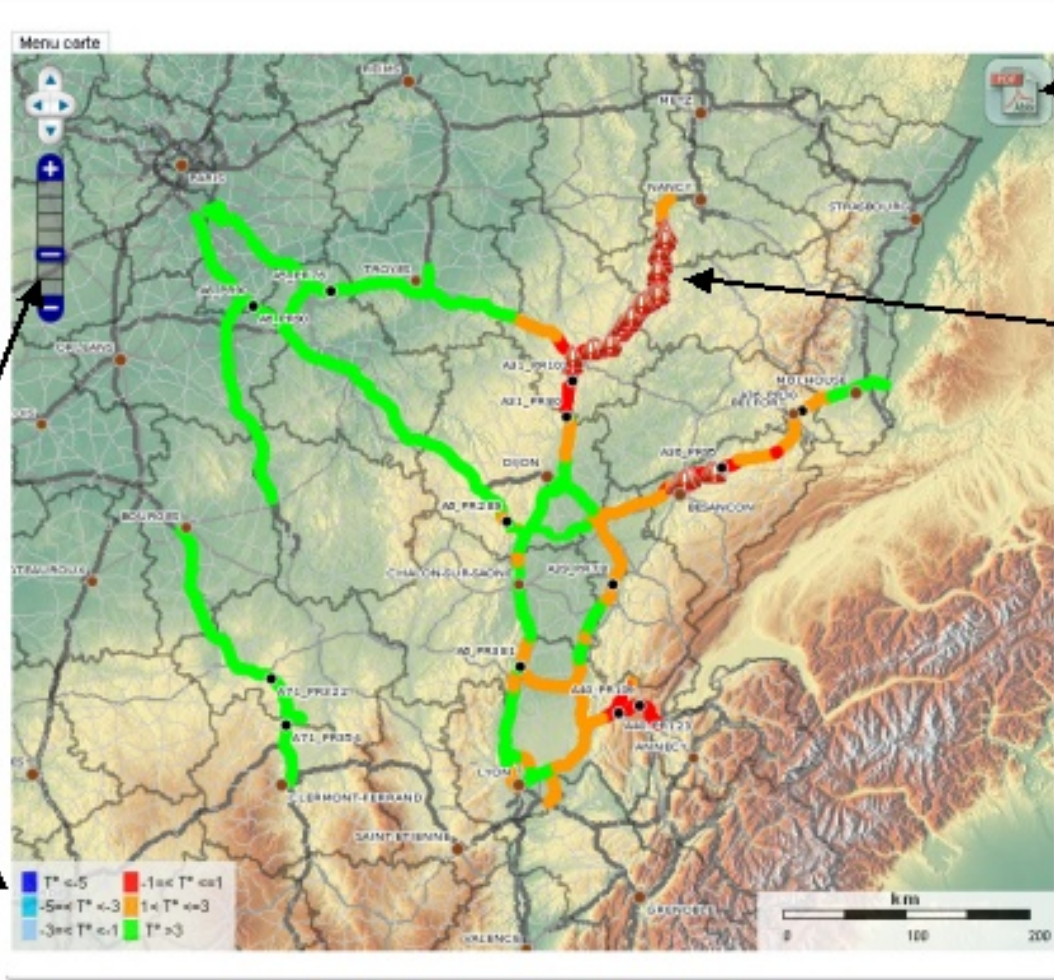
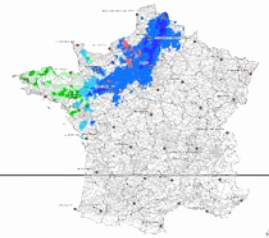


Example : a snow and freezing-rain event crossing over Paris and north west of France (20th January 2010)

Precipitation intensity : 21/12/2009 – 13H10



Road surface temperature



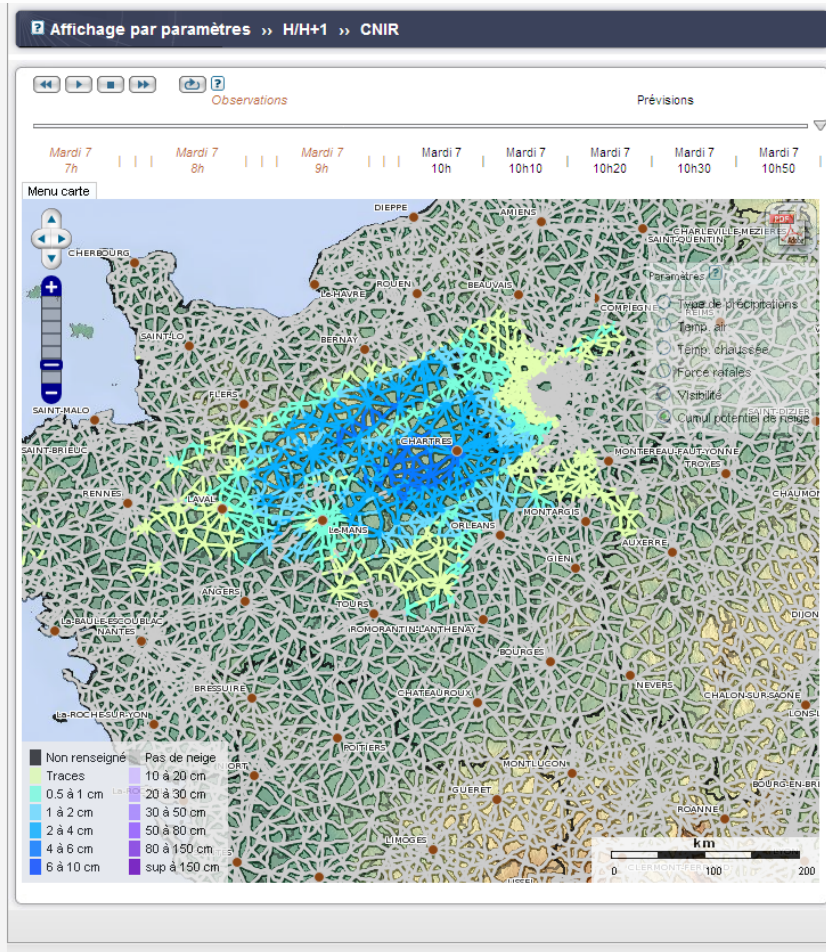
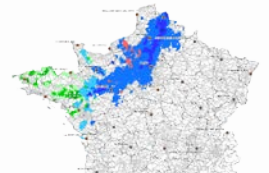
ZOOM

Legend

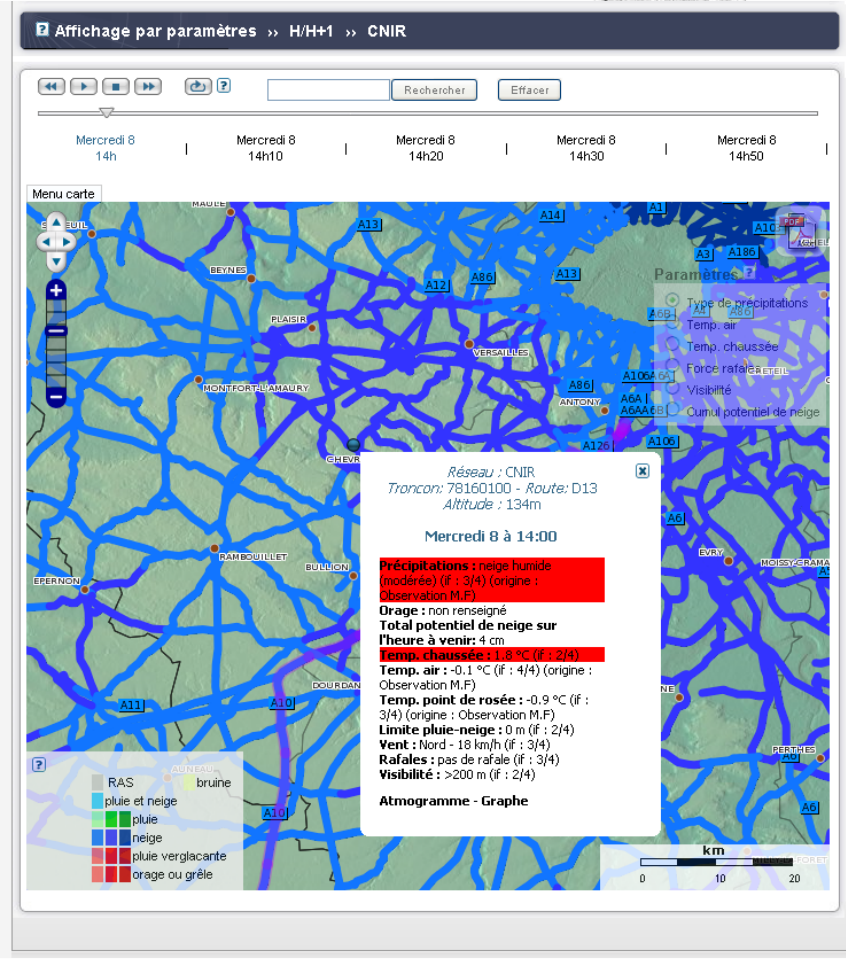
.pdf

Pictogram for the 0°C crossing

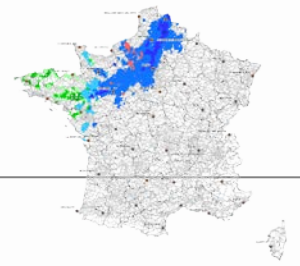
Snow potential accumulation



Approximately 4 cm of snow potential is expected in the South-West of Chartres for the next hour (2010, December 7th from 10H to 11H)



Forecast of 4 cm in one hour in the south of Paris – December 8th, 2010 at 02h00 pm : High traffic jam => Difficulties



Optima's general presentation

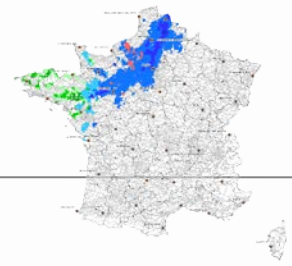
The visualisation of the forecasted parameters

The road weather risk interface in Optima

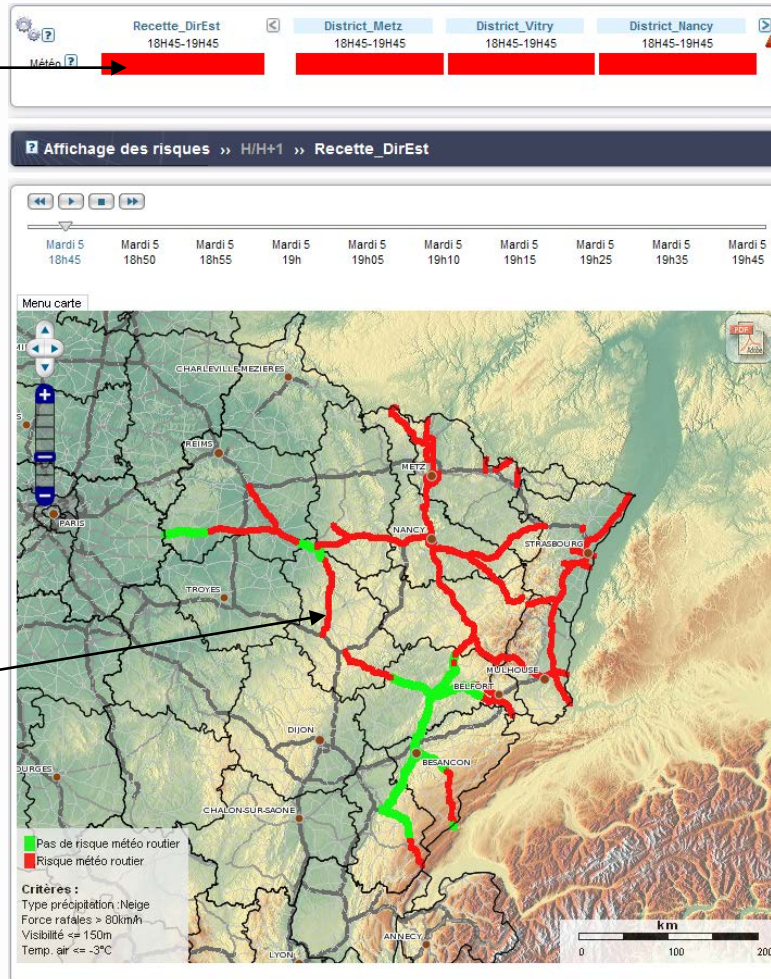
The follow-up of a snow event in France

Conclusion

Optima : road weather risk



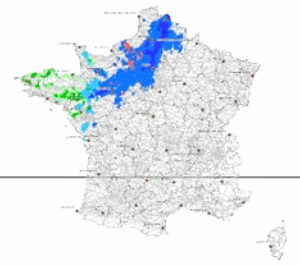
The alerts for each network and sub networks



Risk :

- Green : no risk
- Red : risk

The « alert criteria » is defined by the road manager : 1 or several parameters (with AND or OR combination), possibility of chose the threshold for each parameter....



Optima's general presentation

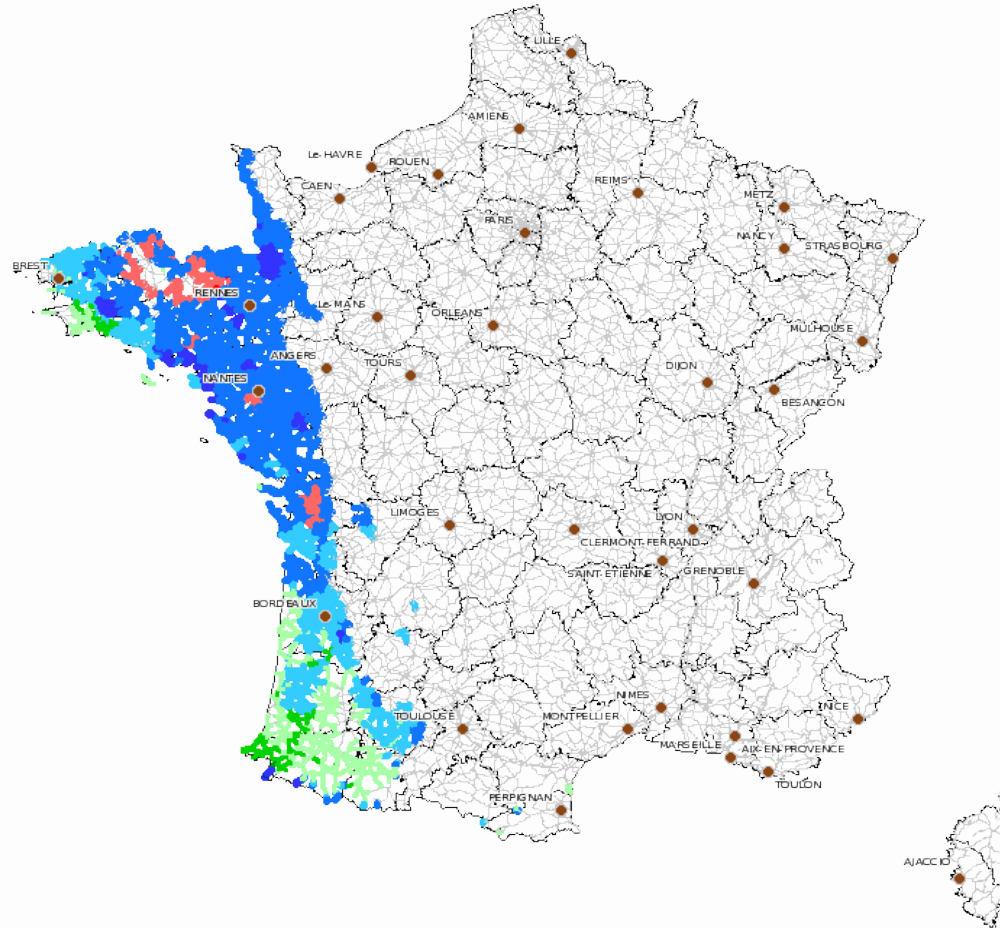
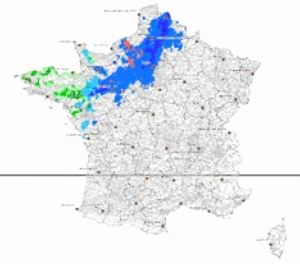
The visualisation of the forecasted parameters

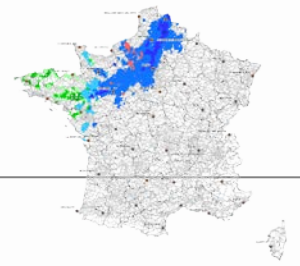
The road weather risk interface in Optima

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

Conclusion

Animation of the meteorological situation from 12 January 14h20 to 13 January 2h20 (2010)





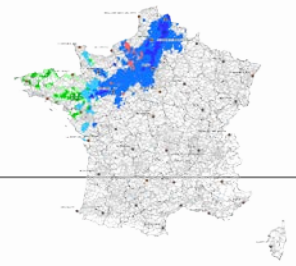
Optima's general presentation

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Conclusion



- Additional meta data integration (slope, bridges...) and algorithms improvements according to post-event analysis
- 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
- Road mobil meteorological data integration
- Improvement of forecasted parameters following advances in research (slipperiness, coupling with trafic...)

Snow situation : 7 and 8th of march 2010

