



# Addressing high levels of air pollution in France - March 2014

Laurence ROUÏL - INERIS

Eléonore TRIGANO- French Ministry of the Environment and Sustainable Development



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de l'écologie,  
du Développement  
durable  
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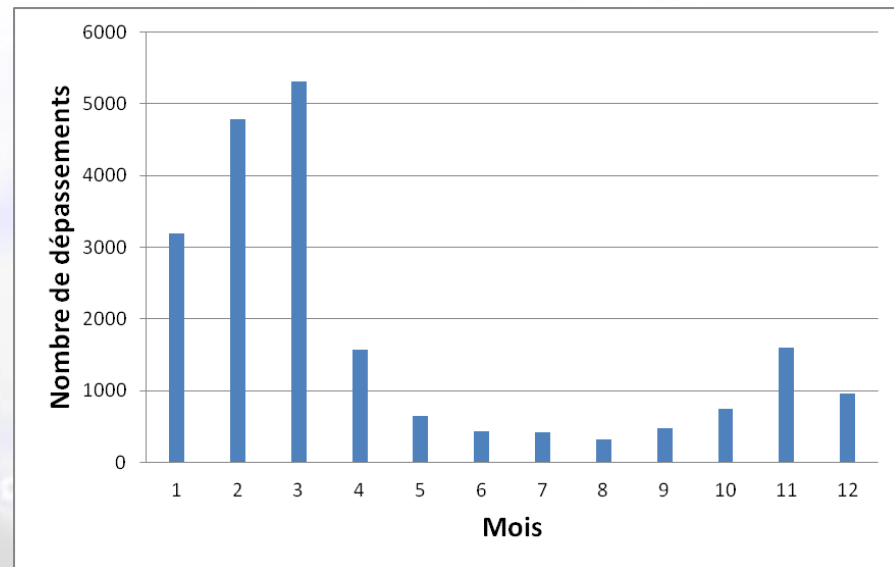
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# An exceptional event ...

- Because of its **geographical coverage** : France and several countries in Europe
- Because of its **duration**: more than one week,
- Because of its **intensity**: daily averages of PM10 exceeding  $80 \mu\text{g}/\text{m}^3$  in several French cities

- However March is usually concerned by high PM levels in France
- Those episodes are characterized by high ammonium nitrate concentrations in PM fine fraction

*Number of situations when the  $50 \mu\text{g}/\text{m}^3$  threshold was exceeded in France from 2009 to 2012*



# March 2014 PM episode in France



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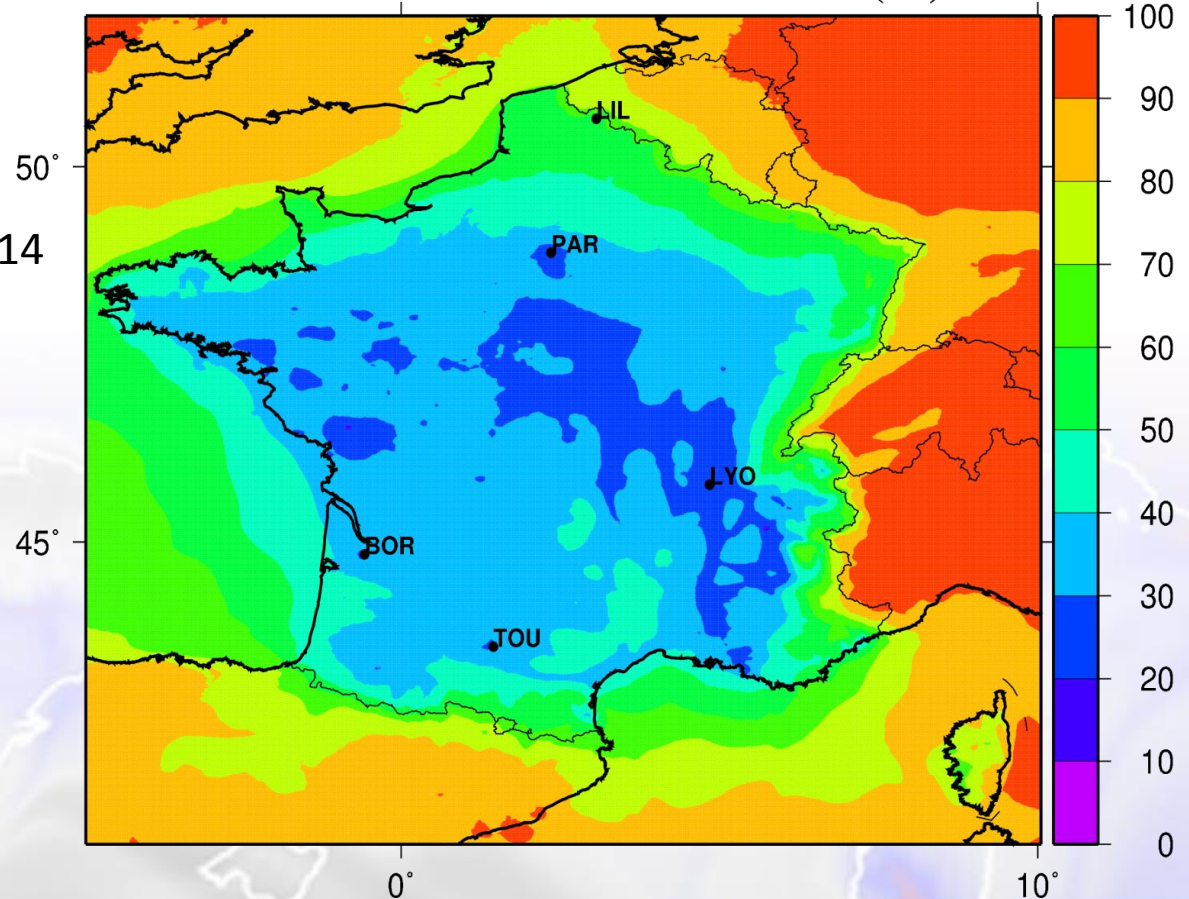
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# Quite large influence of transboundary air pollution

PM10 – Contribution extérieure (%)



Foreign contribution  
(% of PM mass)

From the 7th to 14th March 2014

11 -12 March : Air mass fluxes  
from the East part of Europe  
influencing PM concentrations  
in France



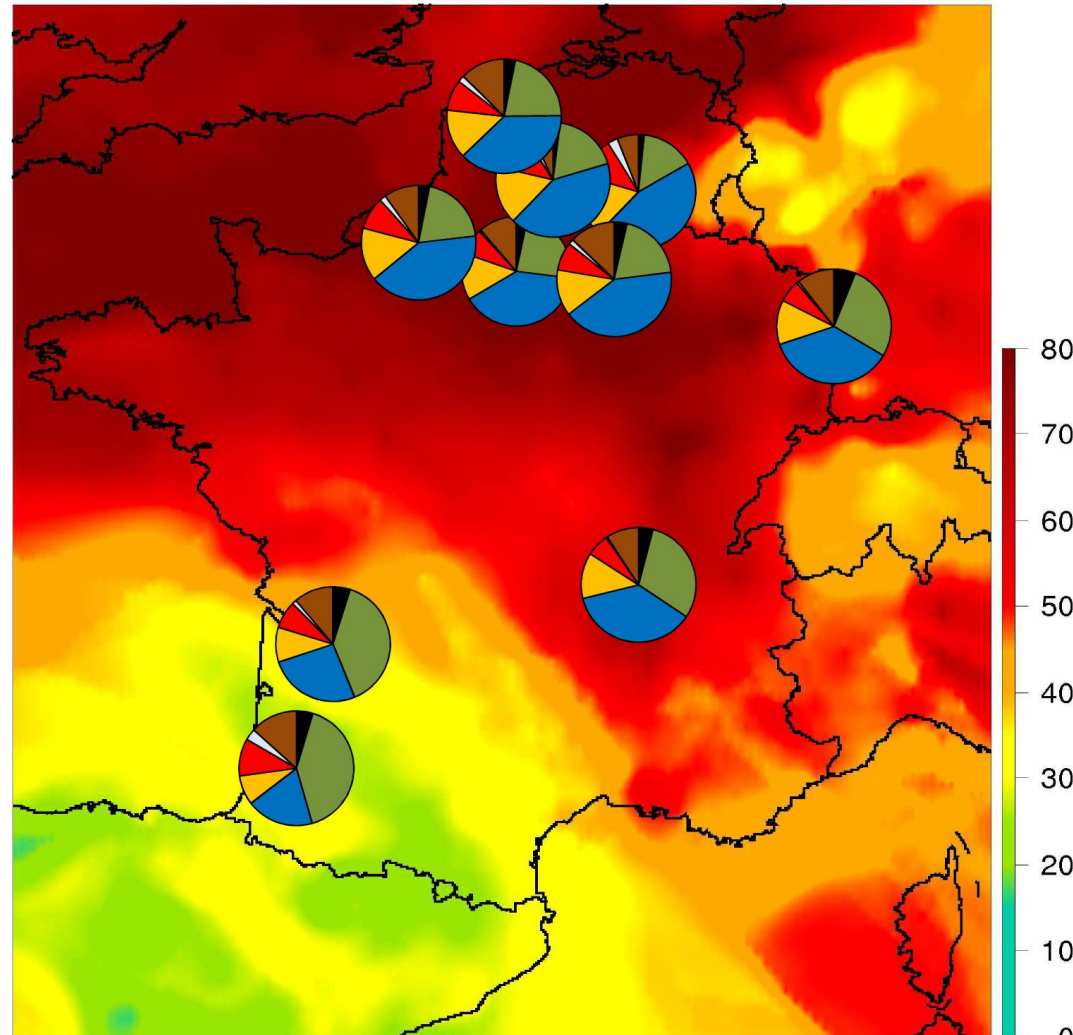
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# Chemical characterisation of PMs during the episode: the CARA program

Répartition des espèces chimiques majeures au sein des  $PM_{10}$ , moyenne du 11 au 15 mars 2014

PREV'AIR

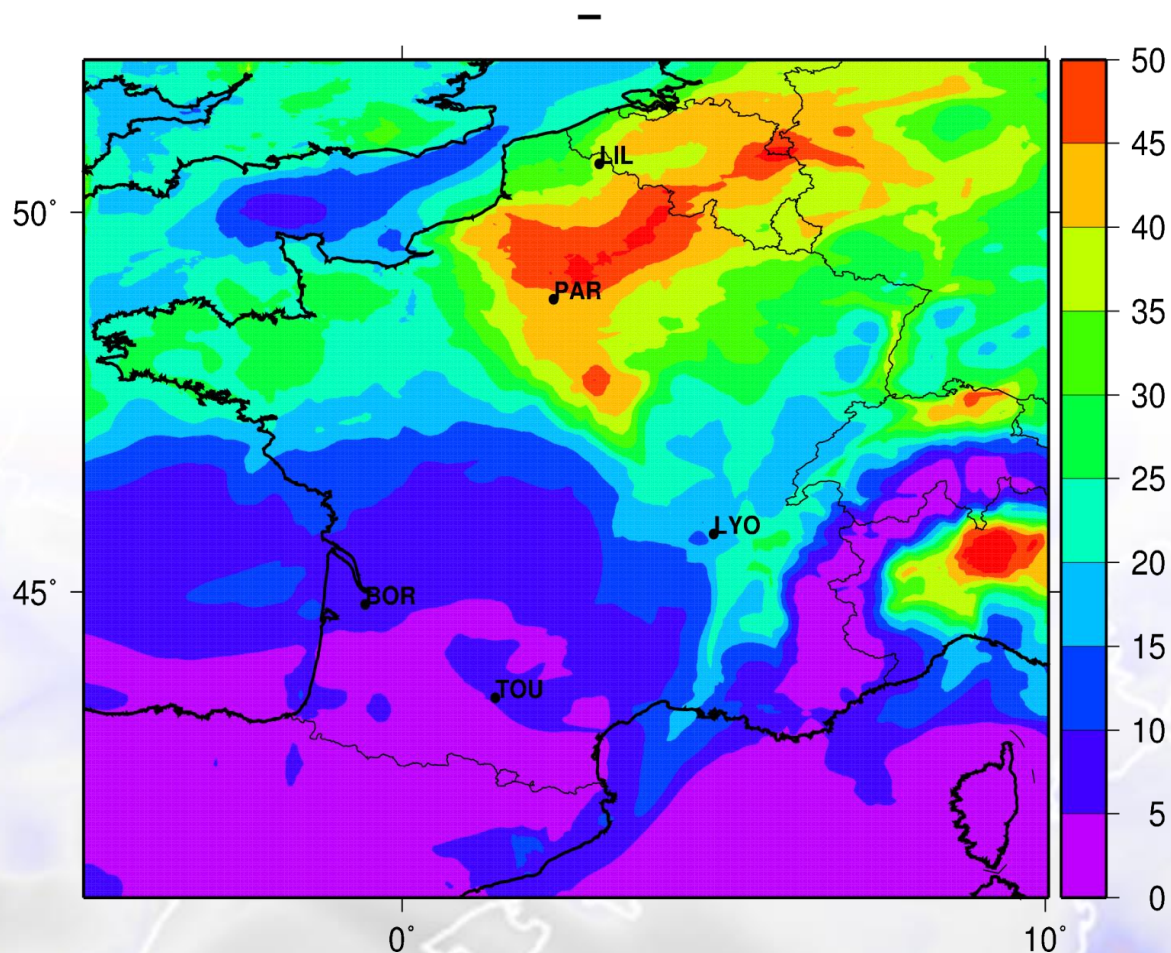
Fond: carte analysée PM10 Prev'Air du 13 mars 2014



- poussières minérales
- sels marins
- sulfate
- ammonium
- nitrate
- matière organique
- carbone suie



# Evaluation of ammonium nitrate concentrations ( $\mu\text{g}/\text{m}^3$ ) 14th March 2014



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# « Emergency » control measures adopted in France

Measures adopted in various activity sectors:

- **Road transport :**

- speed limits (6 regions)
- reinforcement of controls (4 regions)
- city access forbidden for heavy duty vehicles (Ile de France)

- **Industry:**

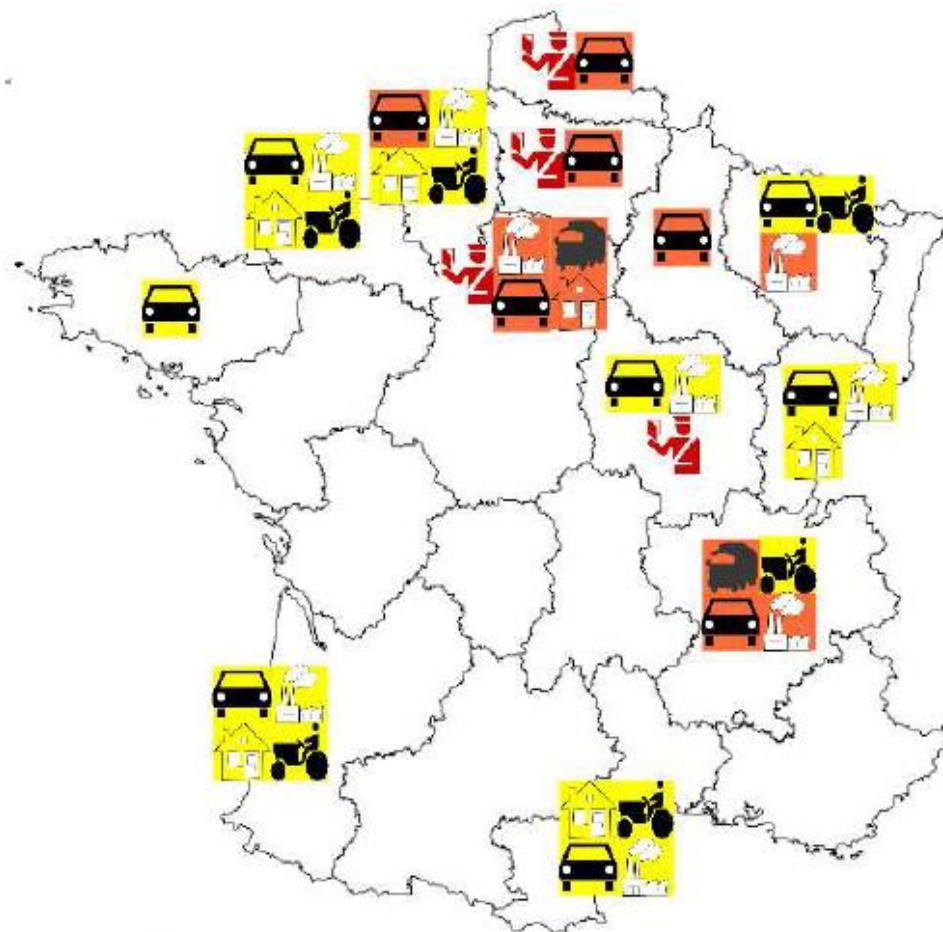
- Voluntary reduction of activities (3 regions)

- **Residential heating**

- recommendations for limiting wood burning (5 regions)

- **Agriculture:**

- Warning messages to encourage limitation of fertilizers spreading (5 regions)



Recommandations/préscriptions transport routier / contrôles renforcés



Recommandations secteur agricole



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# An important role played by local authorities

- Free access to public transports : Ajaccio, Bordeaux, Caen, Dijon, Grenoble, Lyon, Metz, Nancy, Paris, reims, Rouen, Saint-Etienne, Tours
- Free residential parking (3 agglomerations)
- Restricted use of municipalities' vehicles
- In Paris area: **alternate driving scheme on the 17<sup>th</sup> March.**  
Impact estimated by AIRPARIF:
  - **NOx emissions** reduced by 20% inside the city (about -10% outside)
  - **PM10 emissions** reduced by 15% inside the city (about -5 to 8% outside)
    - **PM10 concentrations reduced by 2% (urban background) to 12 % (near busy roads)**



# Impacts of NOx and NH3 emission reduction strategies on ammonium nitrate concentrations

- Concentrations reduced by 5 to 15 % depending on the location
- Higher rates in the South of France but concentrations were lower

**Nit.Amm. – Reduction (%) pour -30% NOx & NH3**

