

belEUROS : an instrument for ozone policy in Belgium

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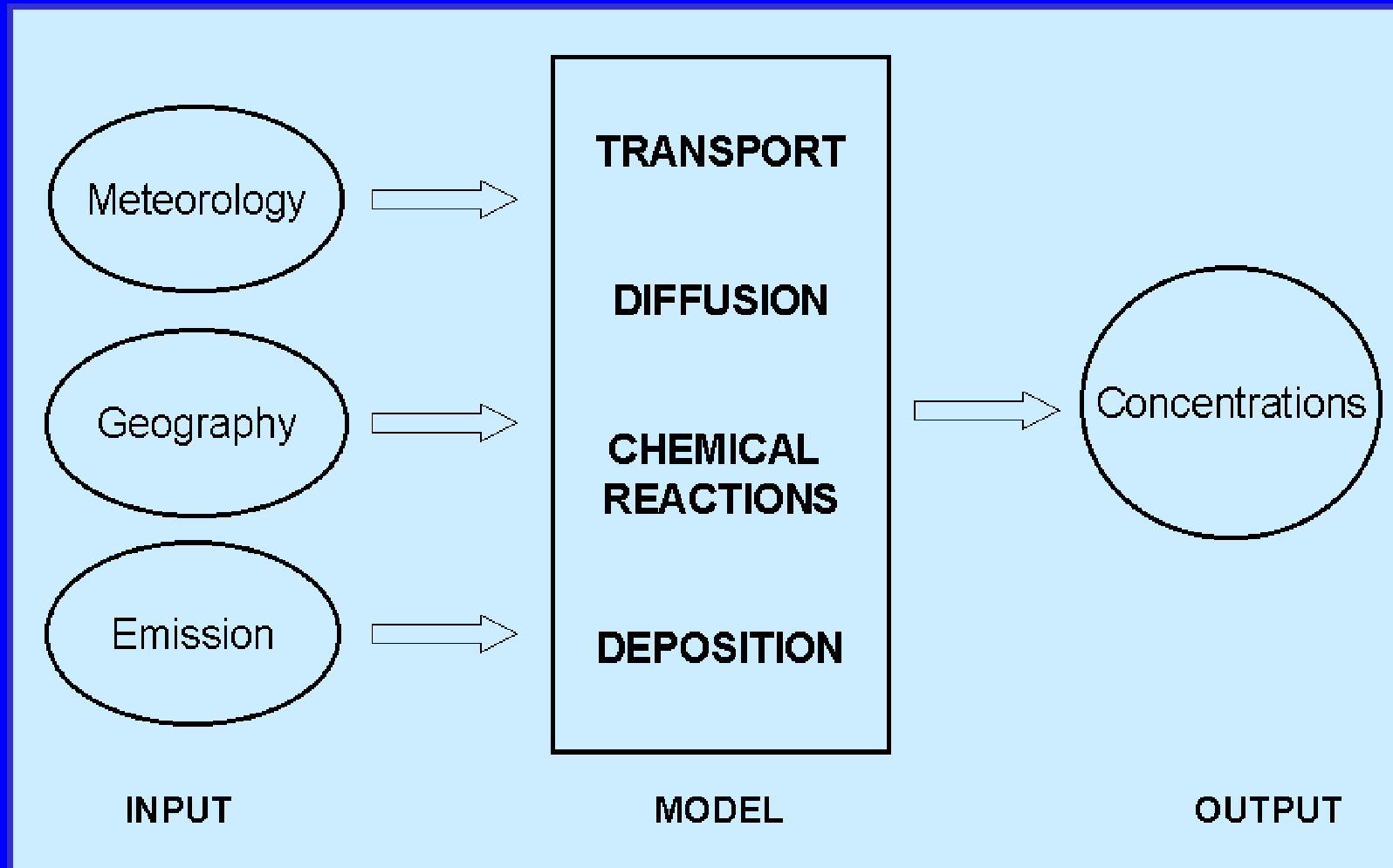
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Tools for policy support

- **Tools to calculate the impact of policy decisions**
 - ***Deterministic Models***
 - Complex input (meteo, emissions, geographical information) + chemistry + physical processes
 - Long CPU
 - >**belEUROS**

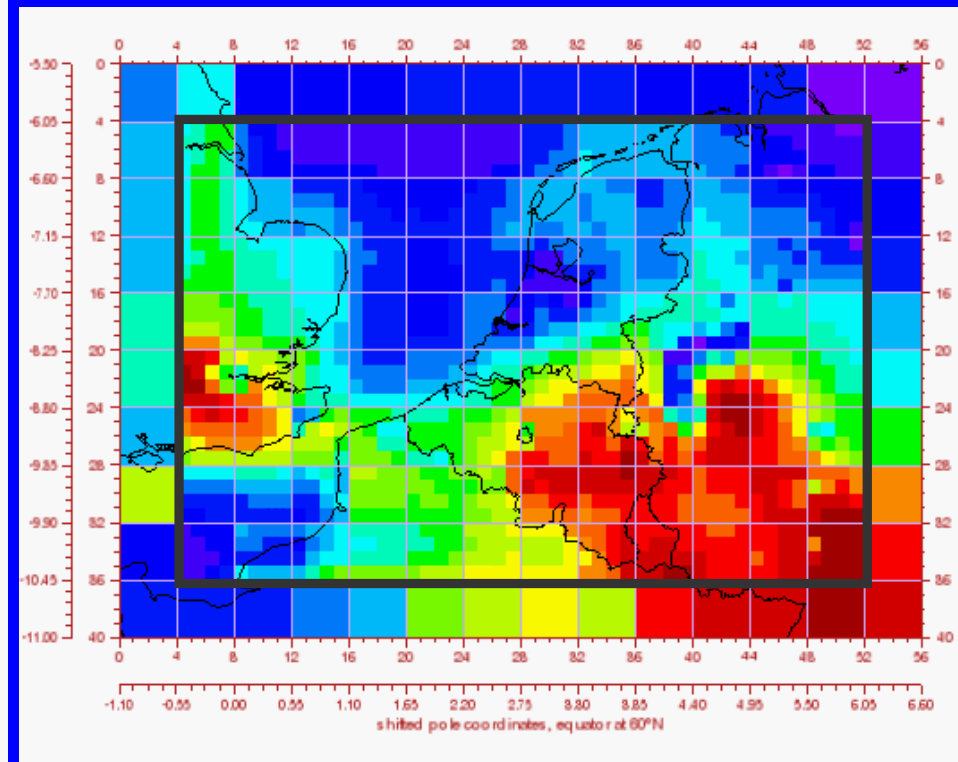
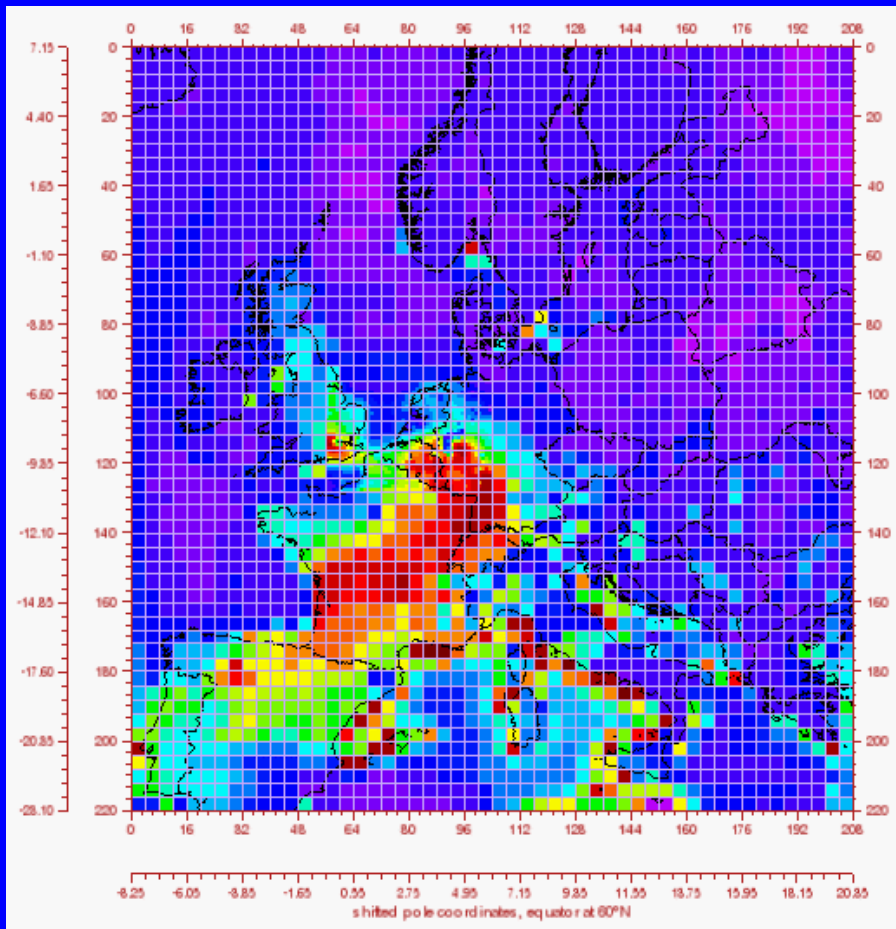
- **Tools for forecasting ozone smog episodes :**
 - ***Statistical Models (or deterministic models)***
 - Simple input (historic ozone database, simple meteo forecasts)
 - short CPU
 - >**SMOGSTOP**

Deterministic Models



EUROS

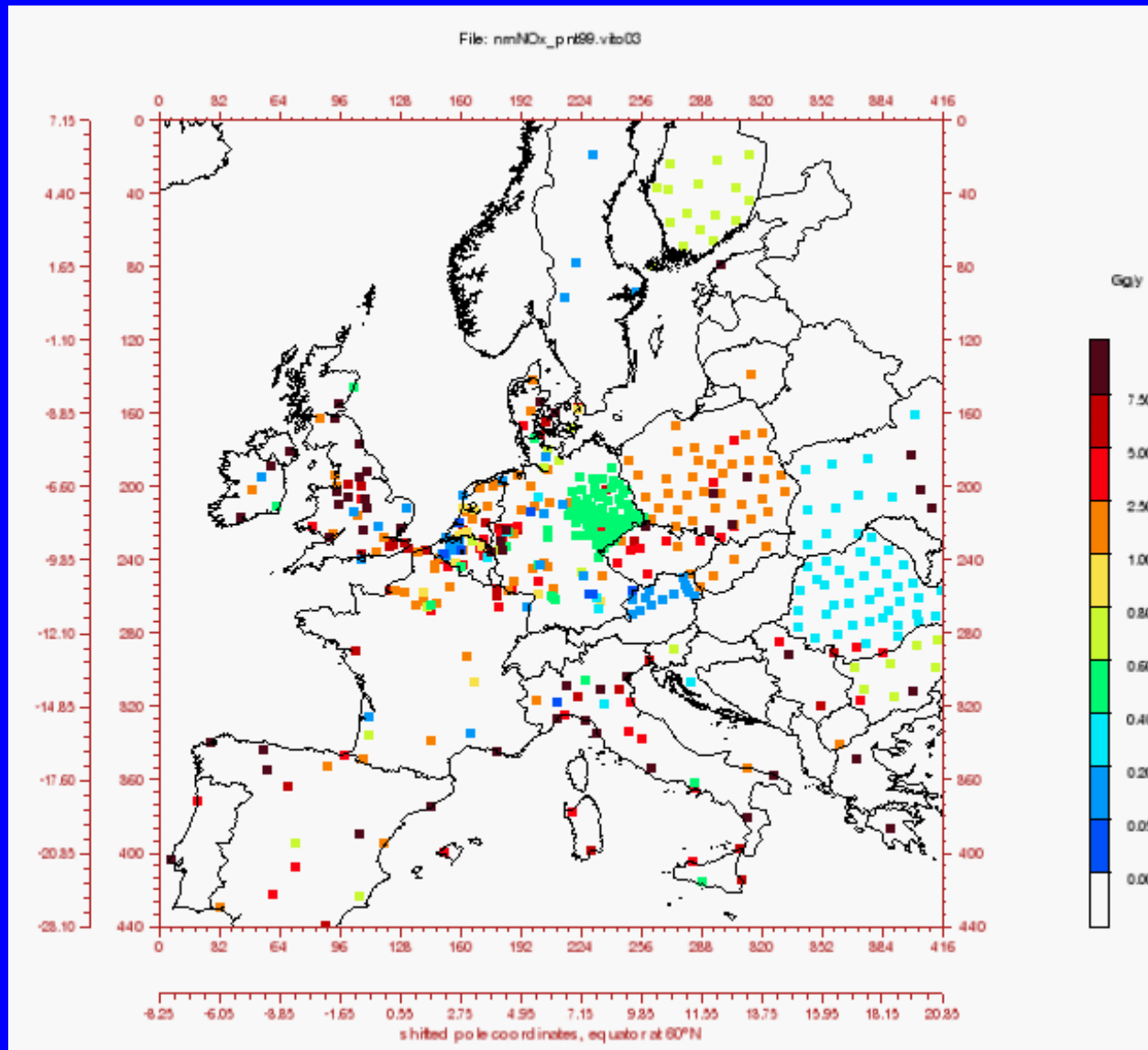
- Simulation of hourly concentrations (O₃, SO₂, ...)
- Domain : Europe
- Standard resolution : +- 60x60 km
gridrefinement : 30x30 – 15x15 (exp : 7.5x7.5)



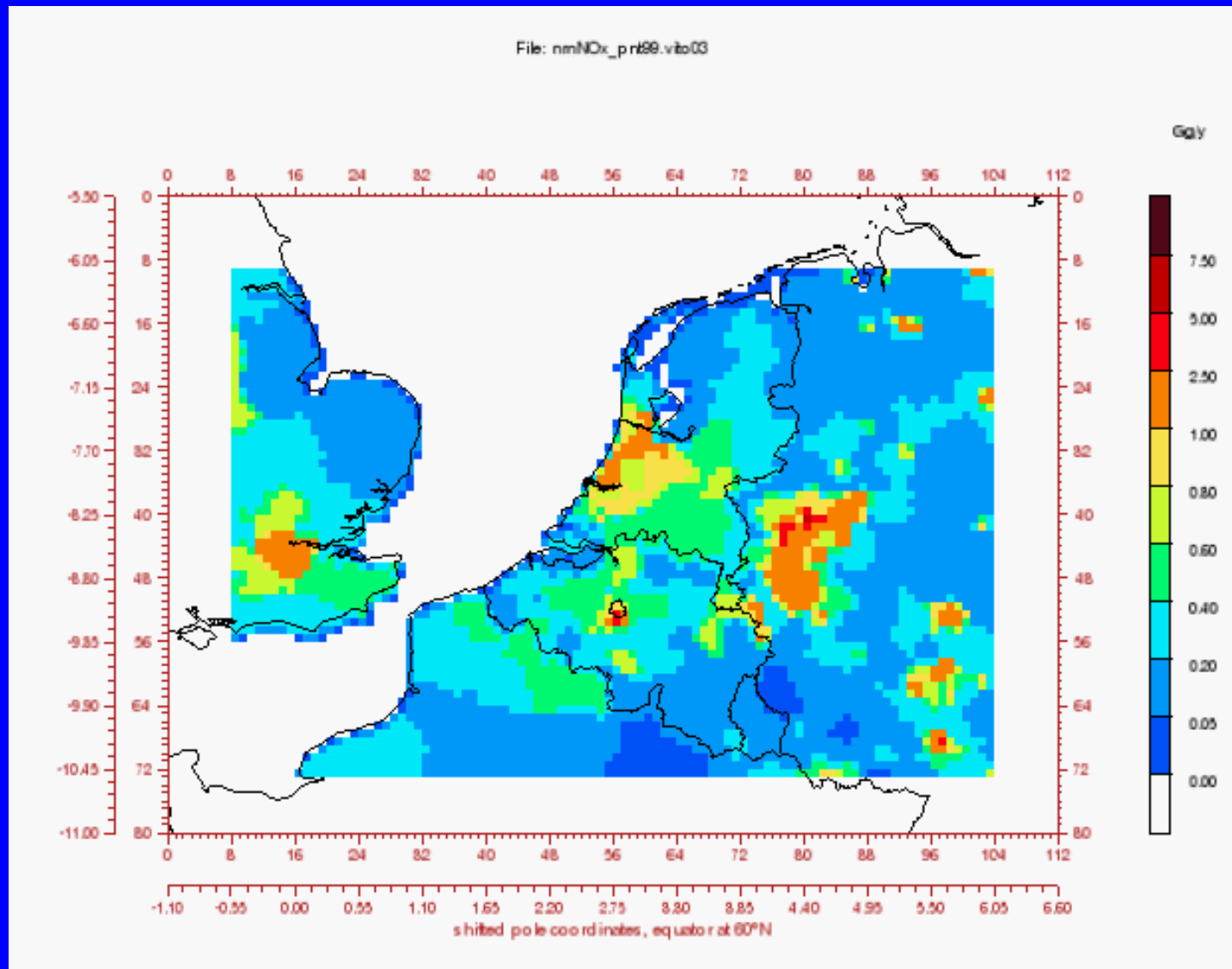
EUROS : Input

- **Meteo : 2-D and 3-D meteo from ECMWF**
->Temp, windfields, cloudcover, ...
- **Geographical**
-> landuse, ...
- **Emissions : NO_x, VOC and SO₂**
 - 6 sector categories (combustion, space heating, refinery, chemical processes, solvents and road traffic) + biogenic VOC
 - Point sources + diffuse emissions

Point source emissions NOx combustion 1999, Europe

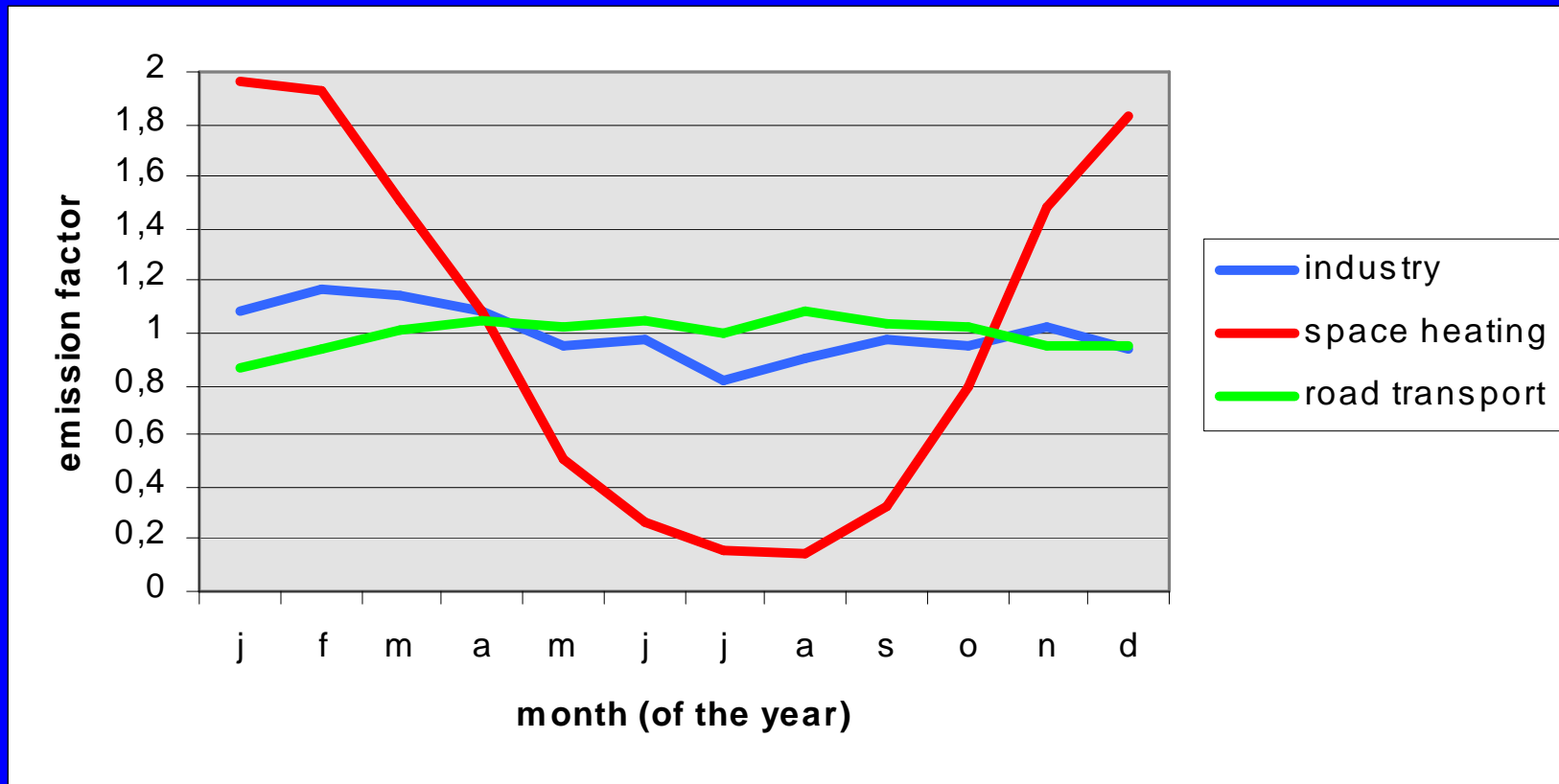


Diffuse emissions NOx traffic 1999, Europe



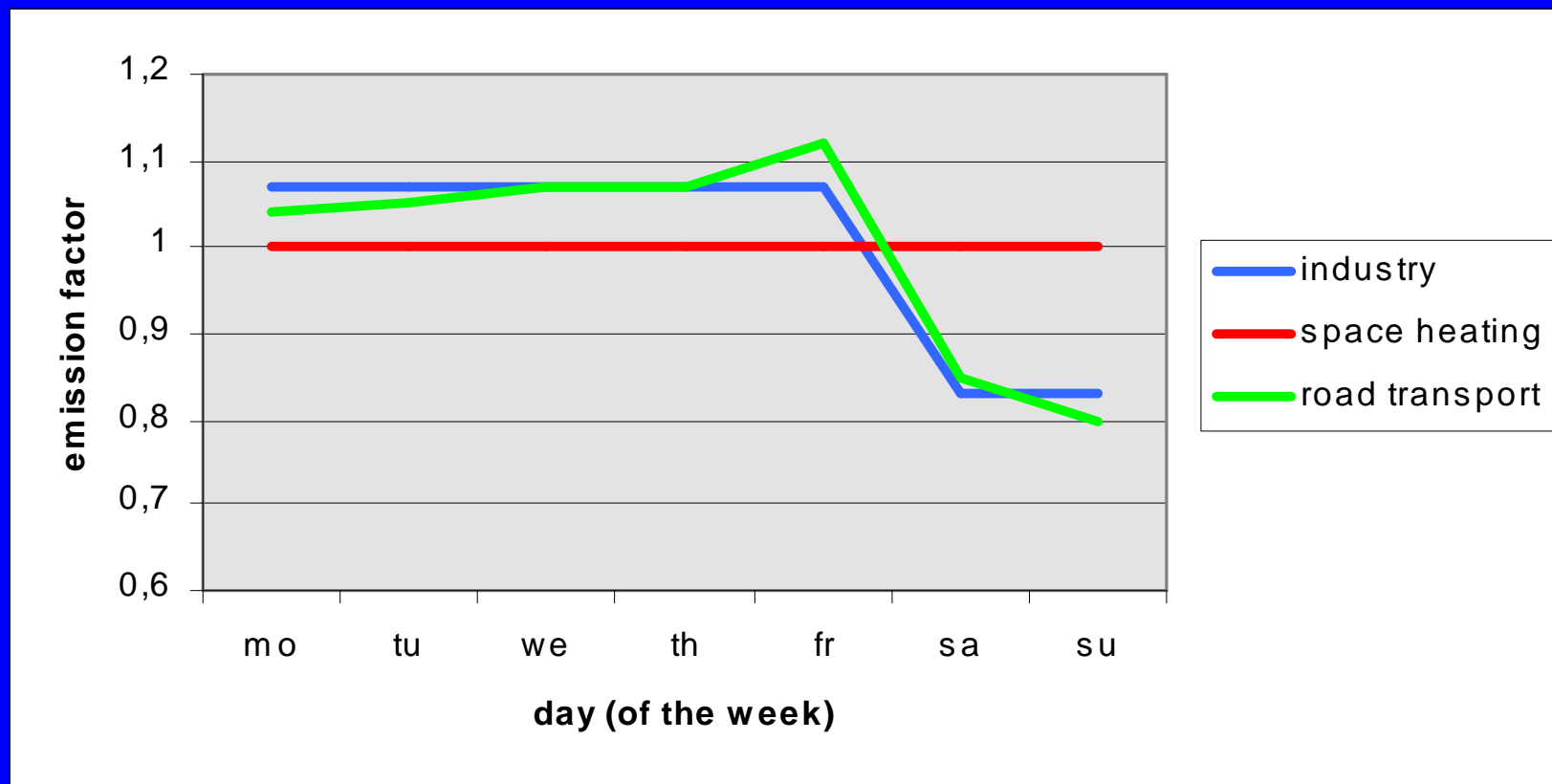
Emissions : Time profiles

Monthly



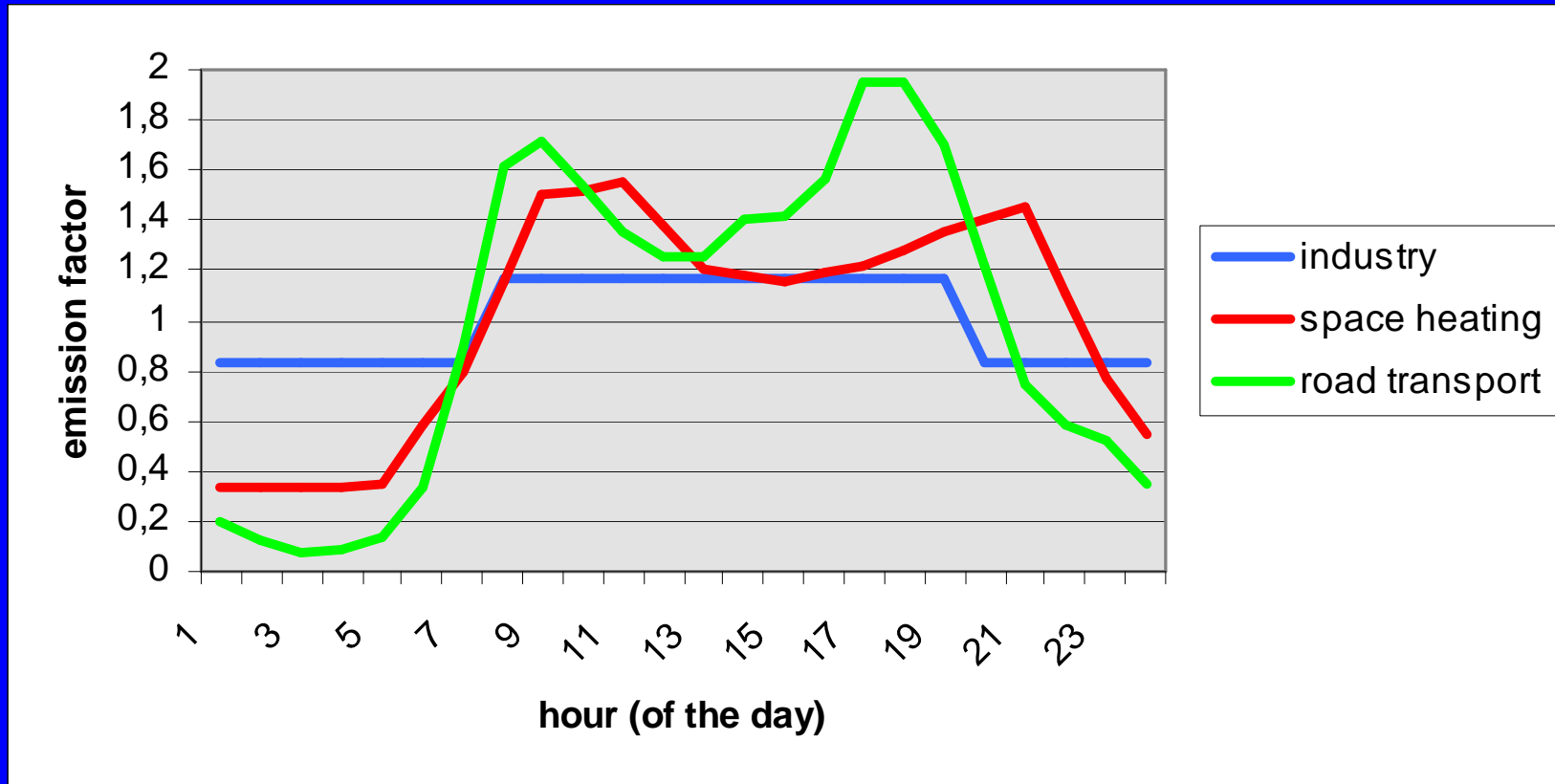
Emissions : Time profiles

Weekly



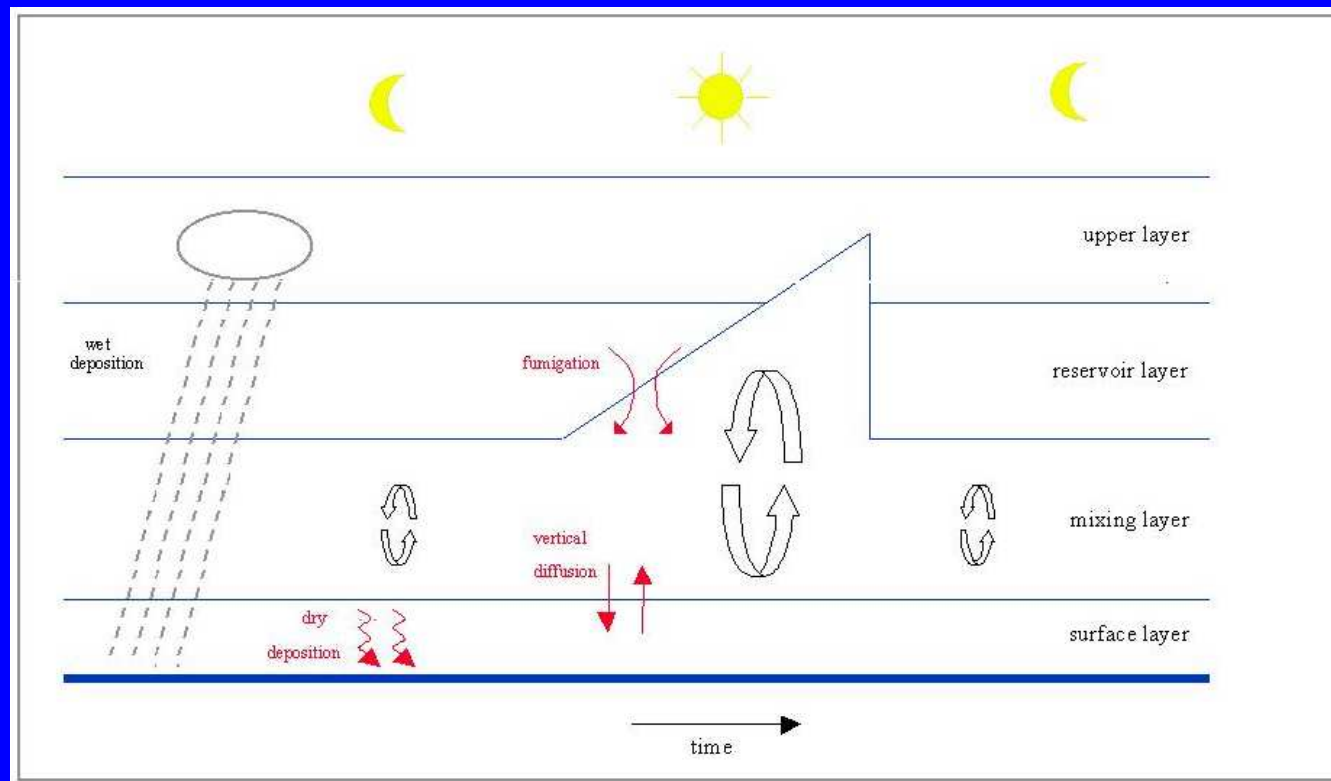
Emissions : Time profiles

Daily



EUROS : model

- Chemistry : 32 components + 87 reactions
- Physical processes



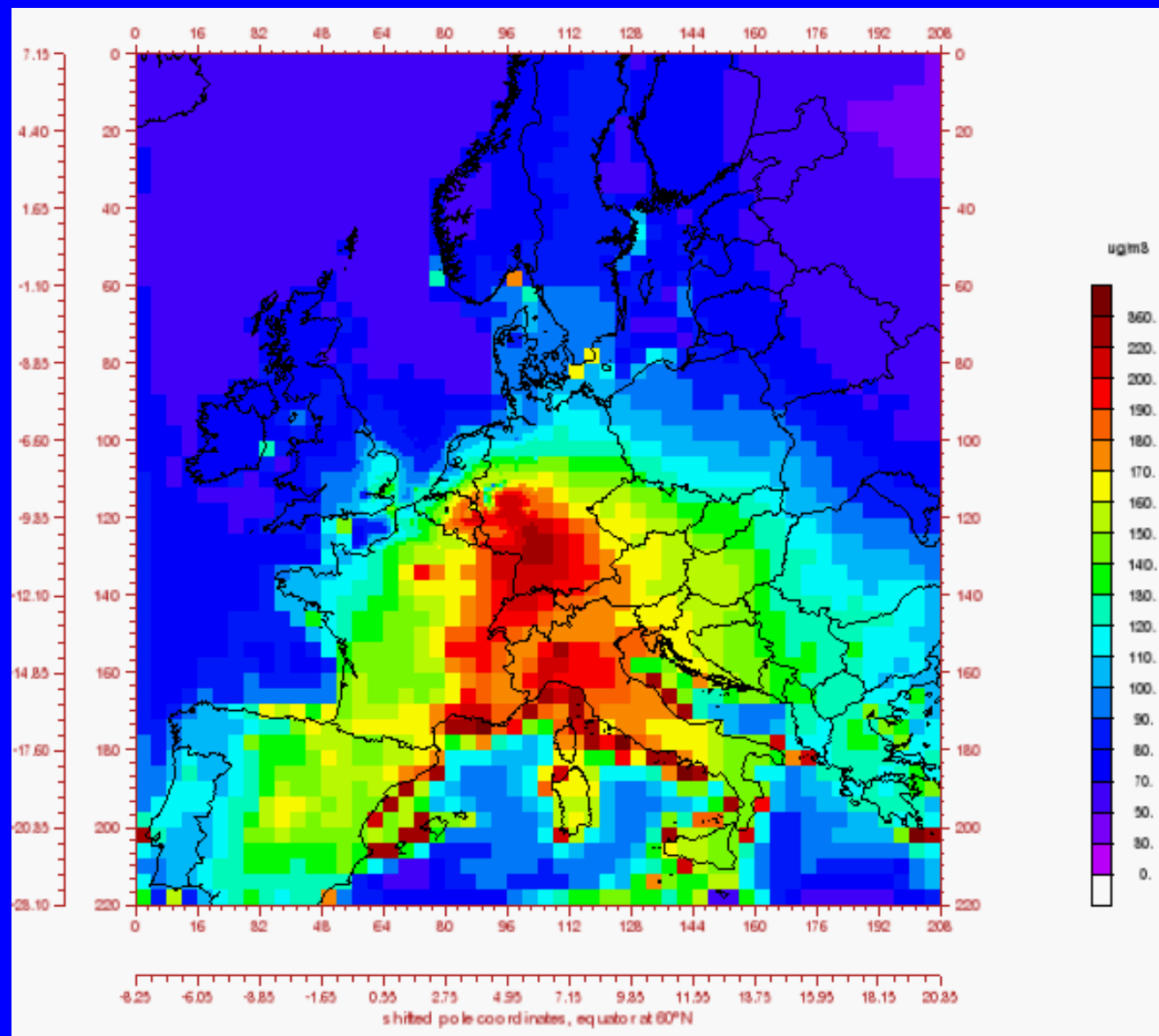
EUROS in Belgium : belEUROS

- **EUROS : development RIVM (Netherlands)**
- **DWTC project (VITO, UCL, FPMs, KMI,IRCEL in collaboration with RIVM) (1999 - 2001) :**
 - > **adapting input : emissions + meteo**
 - > **installation at IRCEL-CELINE**
 - > **access via internet (user interface)**

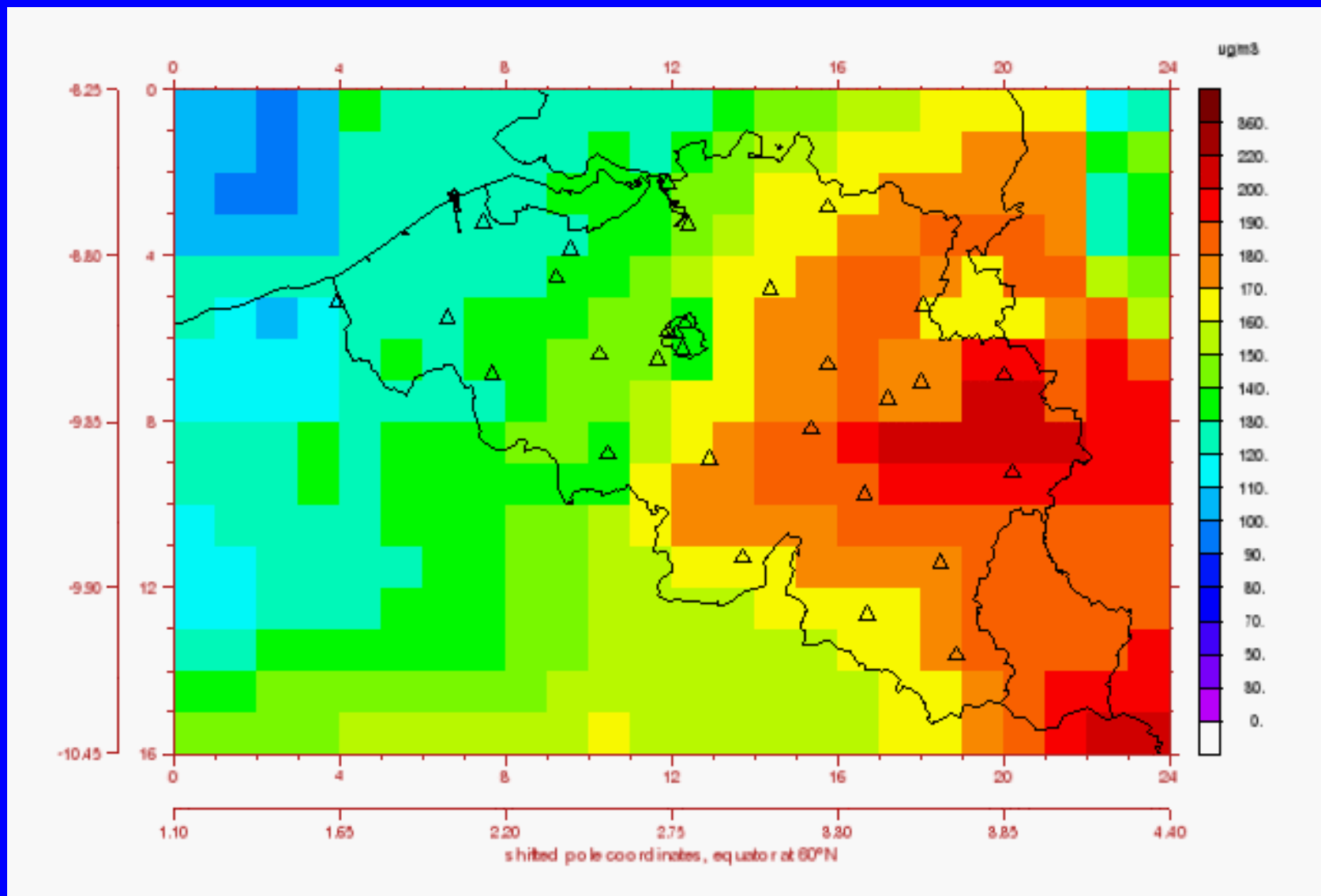
Conclusions (after testing by usersgroup):

- **gridrefinement = essential**
 - > **emission preprocessor (VITO) (2002)**
- **Extra meteo (5 months 1997 to full 12 years)**
 - > **access to ECMWF databases by IRCEL (2002)**
- **New userinterface**
 - > **IRCEL-CELINE (2003-2004)**

Simulation ozone smog episode, august 2003 : emissions 1999
Europe : mean daily maximum concentrations : 1/8 till 14/8



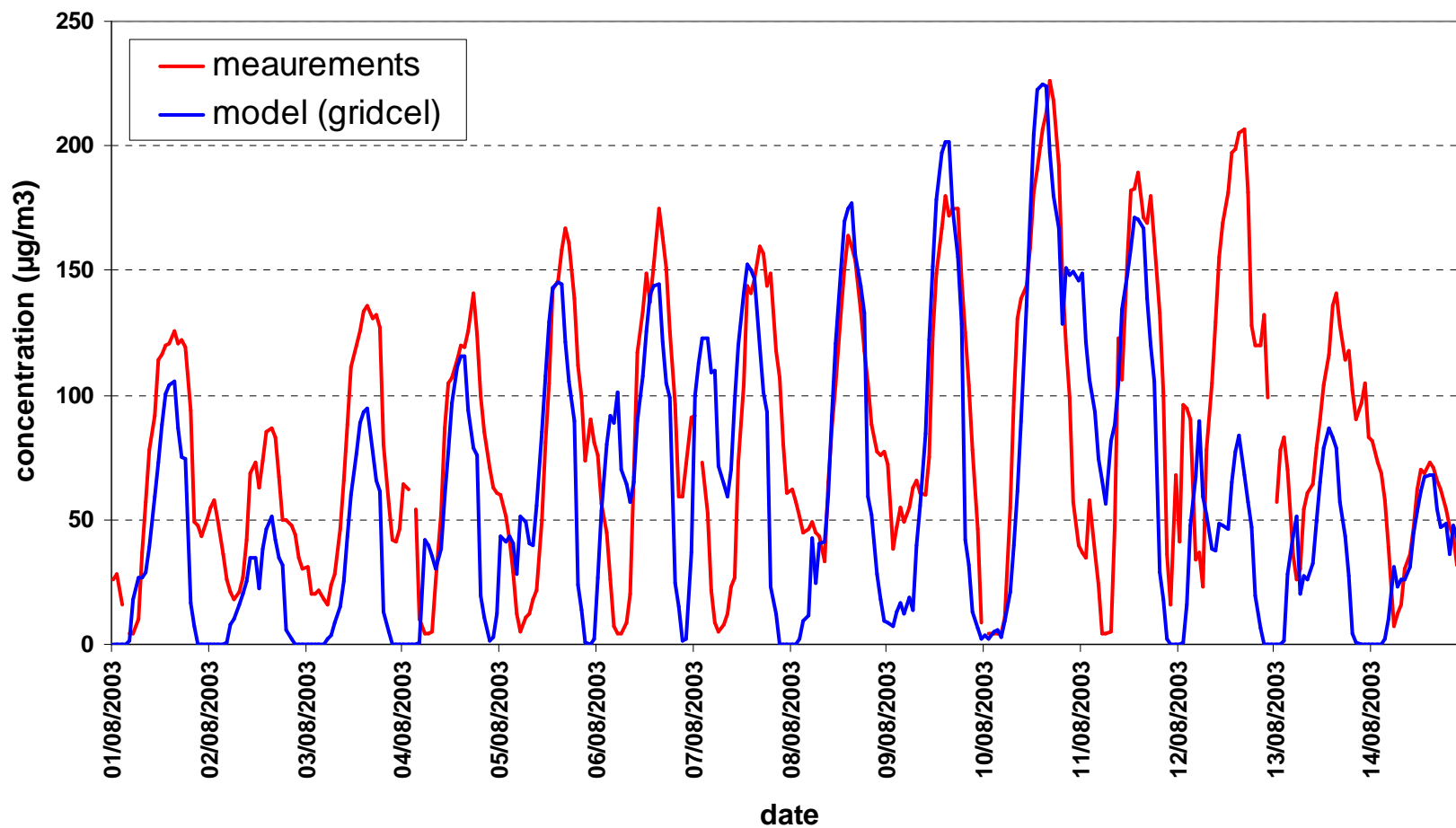
Simulation ozone smog episode, august 2003 : emissions 1999
Belgium : mean daily maximum concentrations : 1/8 till 14/8



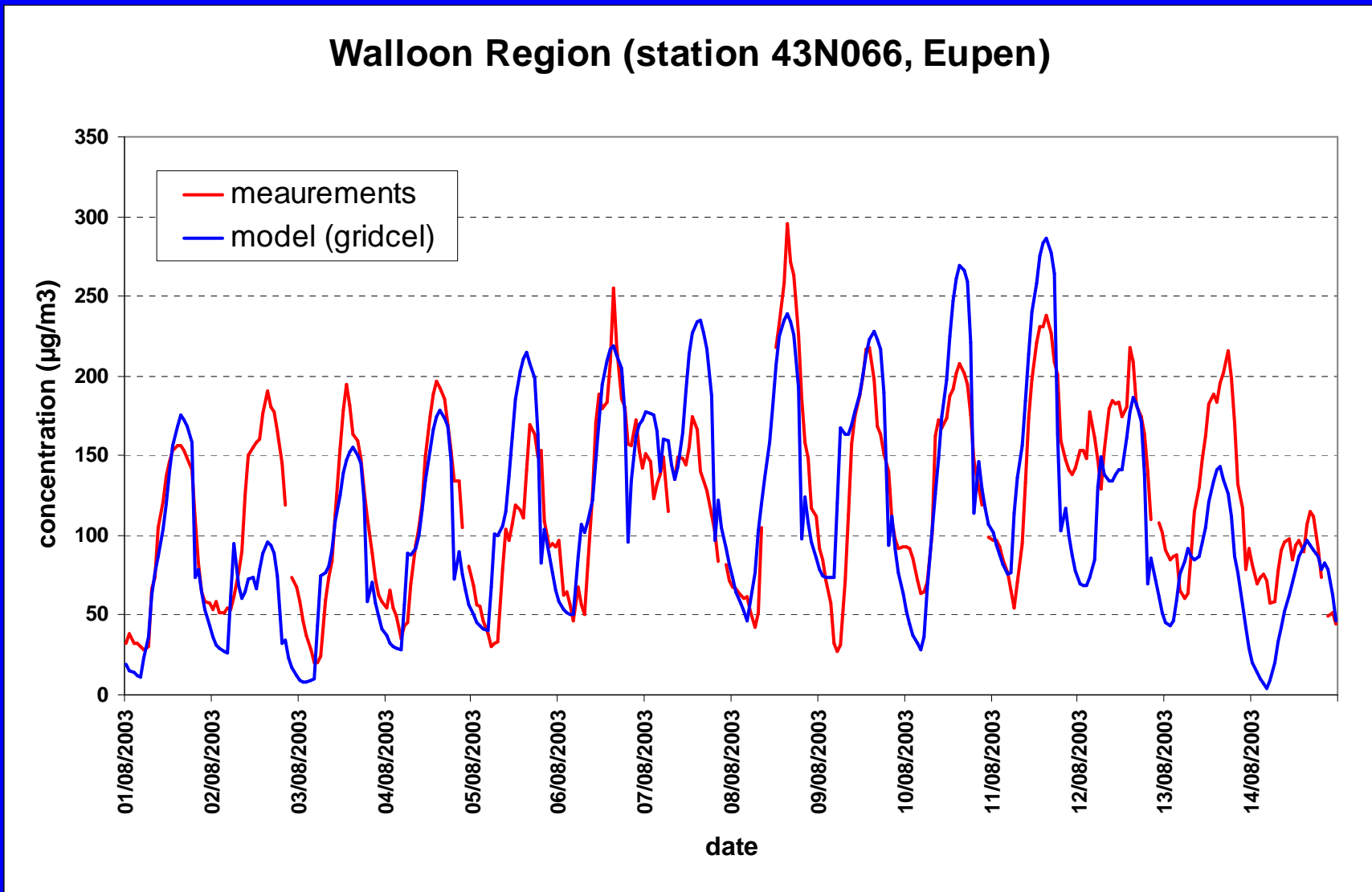
Simulation ozone smog episode, august 2003 : emissions 1999

Hourly evolution ozone concentrations (urban)

Brussels Capital Region (station 41R001, Molenbeek)

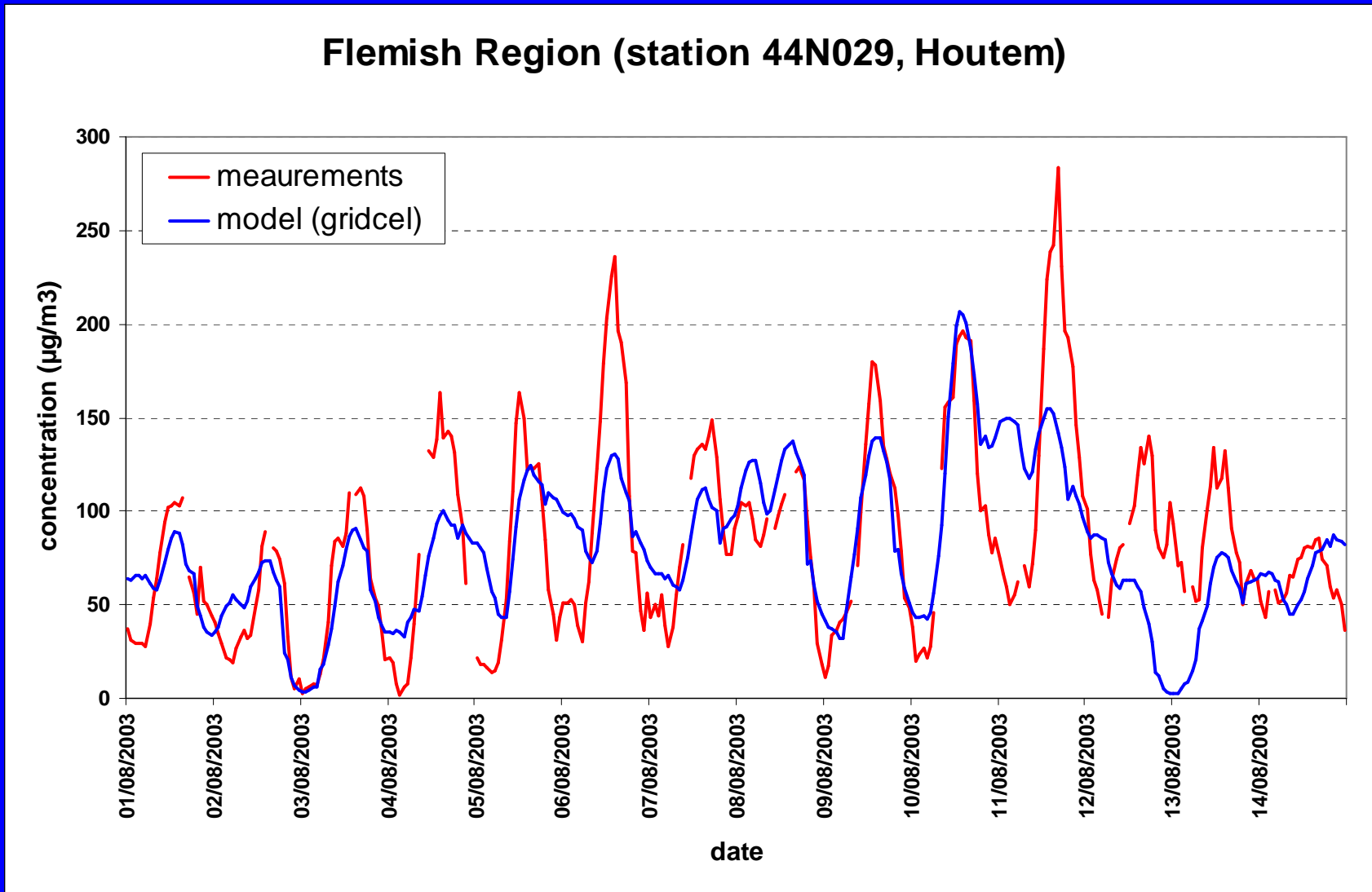


Simulation ozone smog episode, august 2003 : emissions 1999
Hourly evolution ozone concentrations (rural)

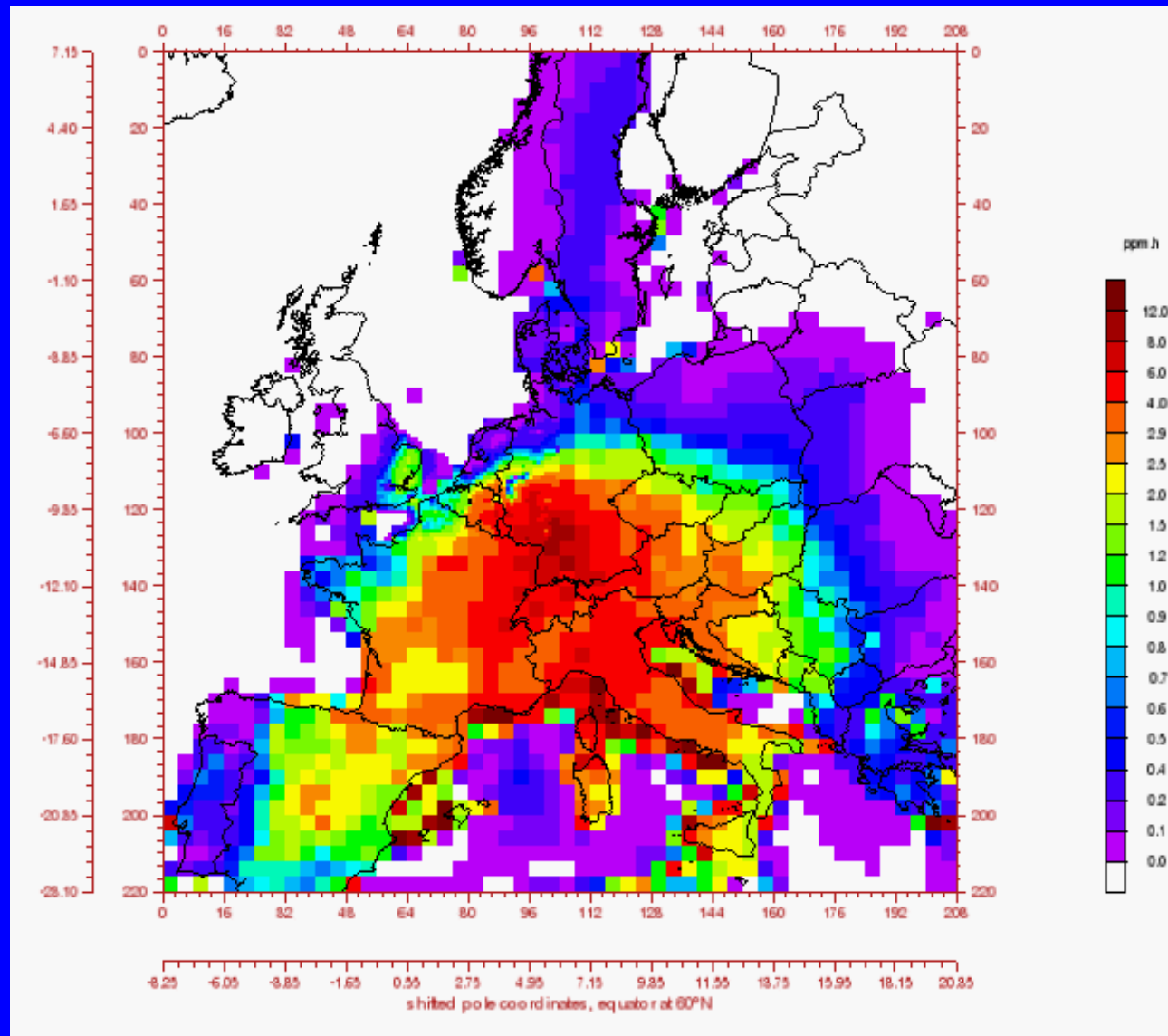


Simulation ozone smog episode, august 2003 : emissions 1999

Hourly evolution ozone concentrations (rural)

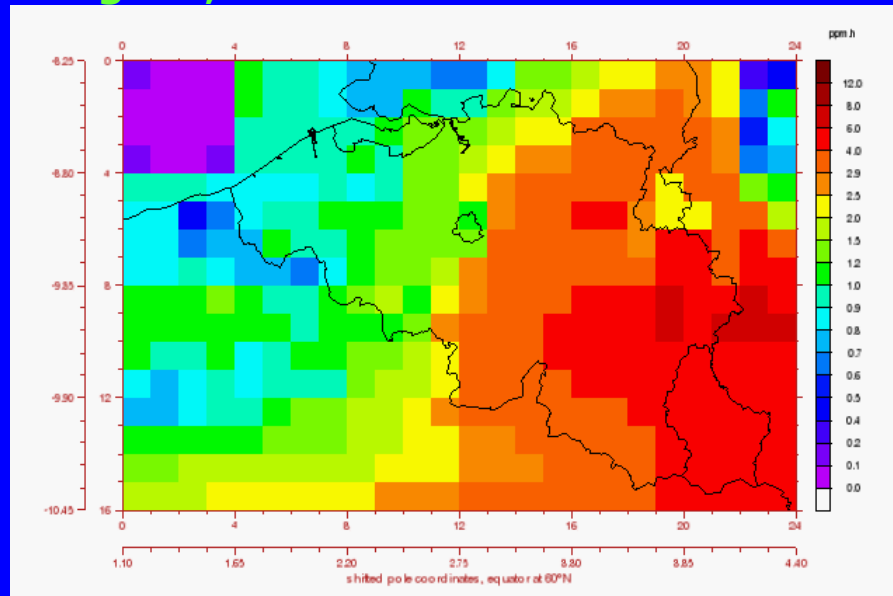


Simulation ozone smog episode, august 2003 : emissions 1999
Europe : AOT60 (hourly values) : 1/8 till 14/8



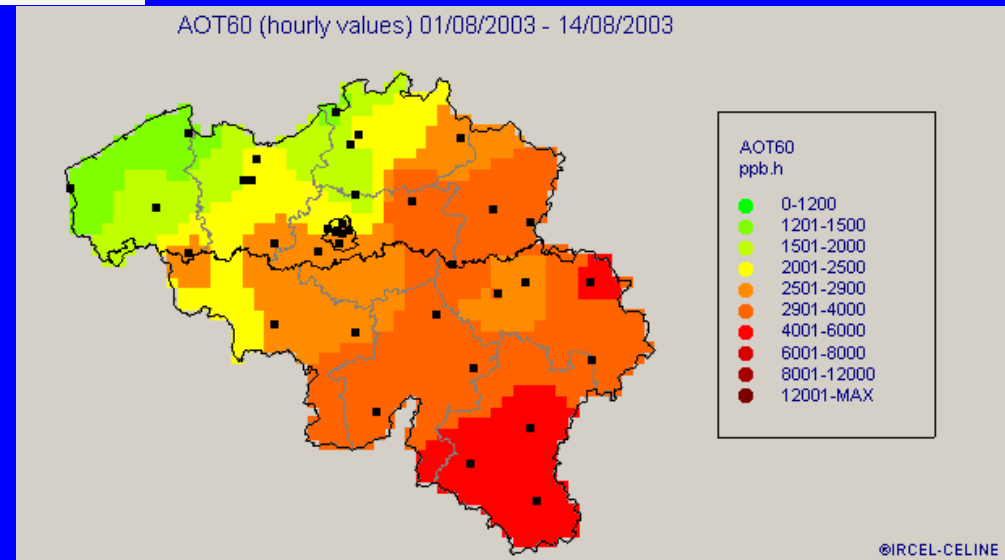
ozone smog episode, august 2003

Belgium, belEUROS simulation



Belgium, Measurements

AOT60 (hourly values) 01/08/2003 - 14/08/2003



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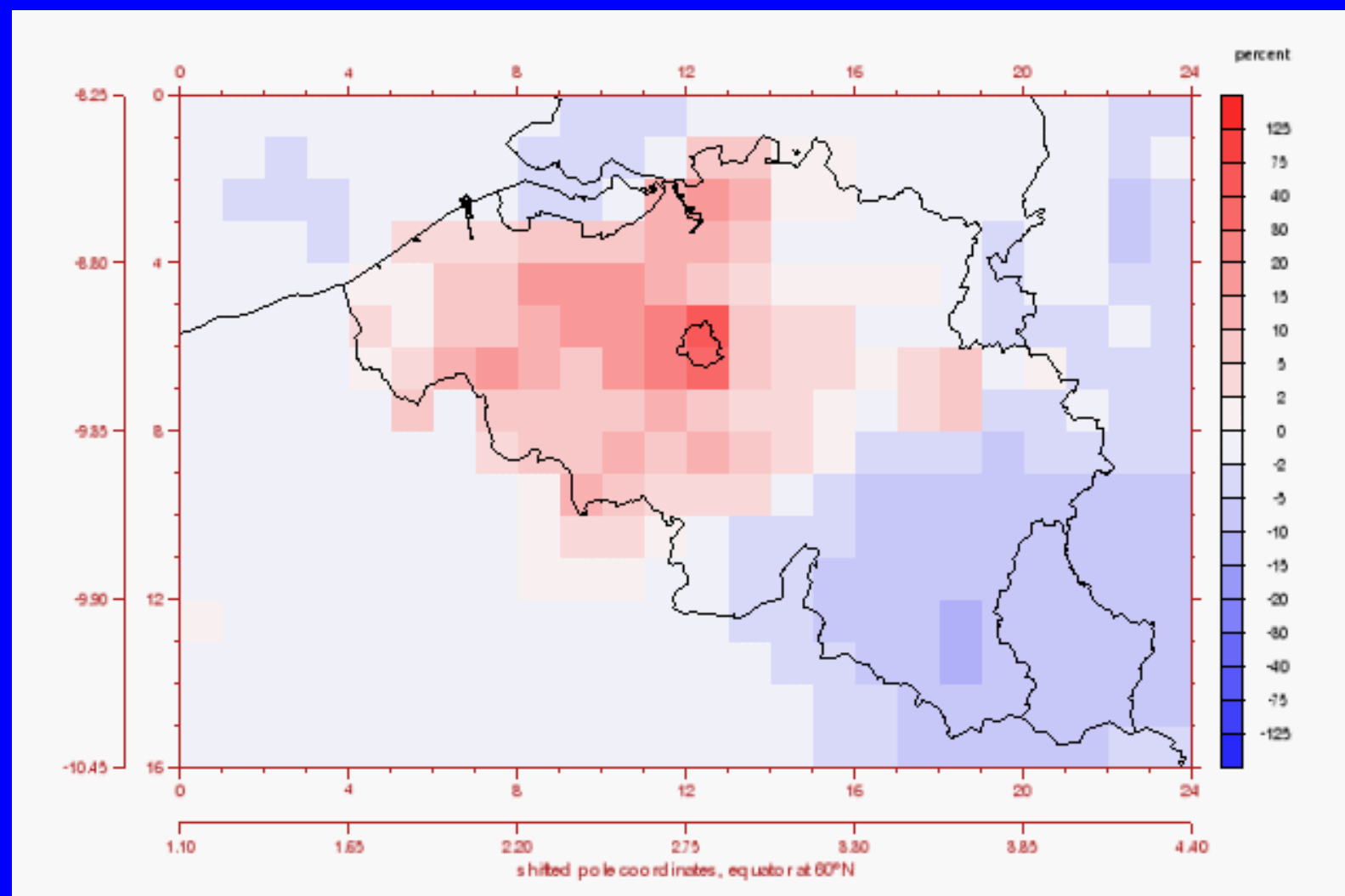
belEUROS : policy questions

- **Effect of short term measures during episodes?**
 - **Traffic emissions Belgium :**
'weekend' regime (-30% NO_x, -20% VOC)
start : 25/7/2003 (1 week before episode)

- **Is it getting worse or better :**
 - **since 1990 ?**
 - **in the future ?**

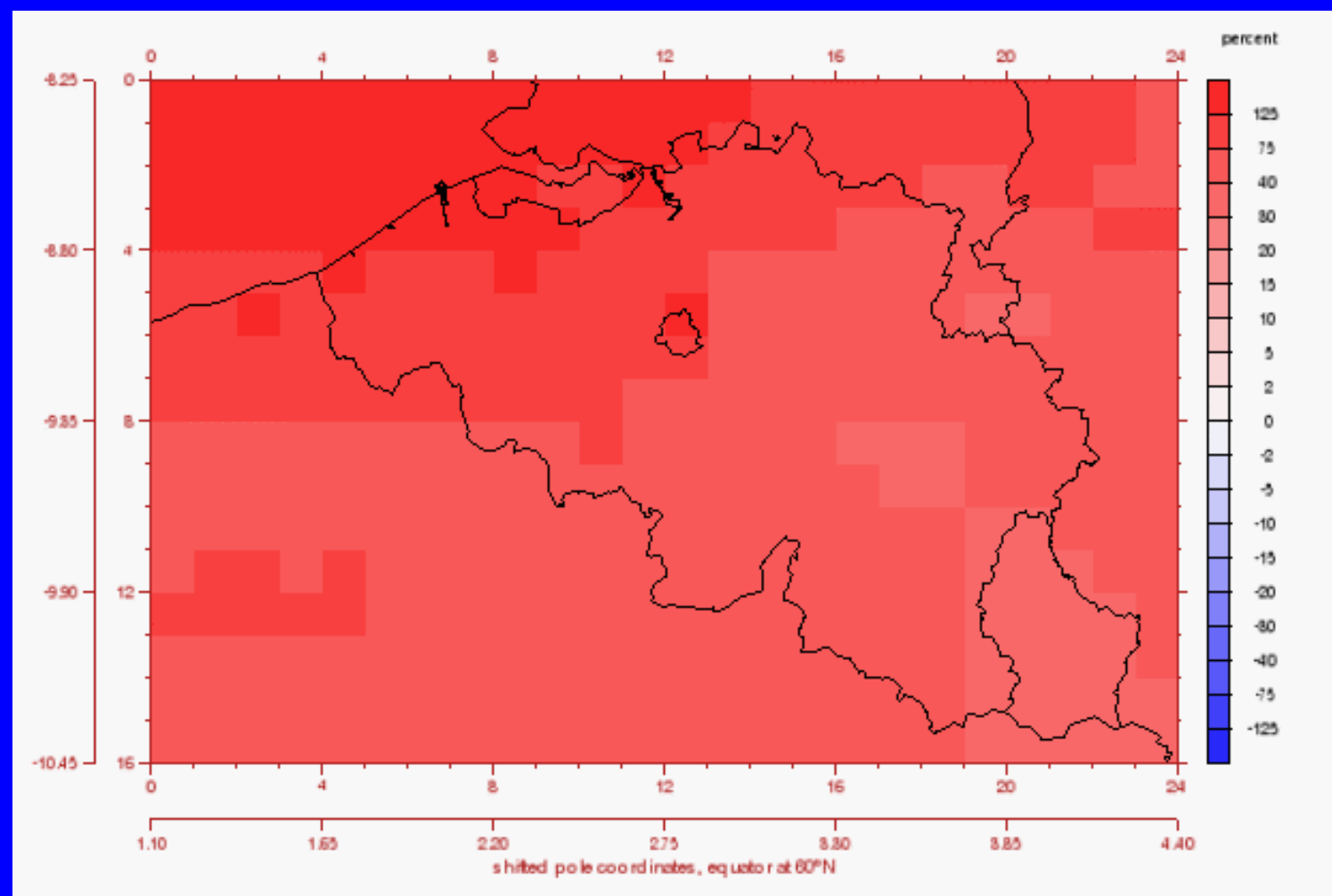
Simulation ozone smog episode, august 2003

Belgium : Relative difference (period 1/8 till 14/8) between AOT60 (no scenario) and AOT60 ('weekend' traffic regime starting 25/7)



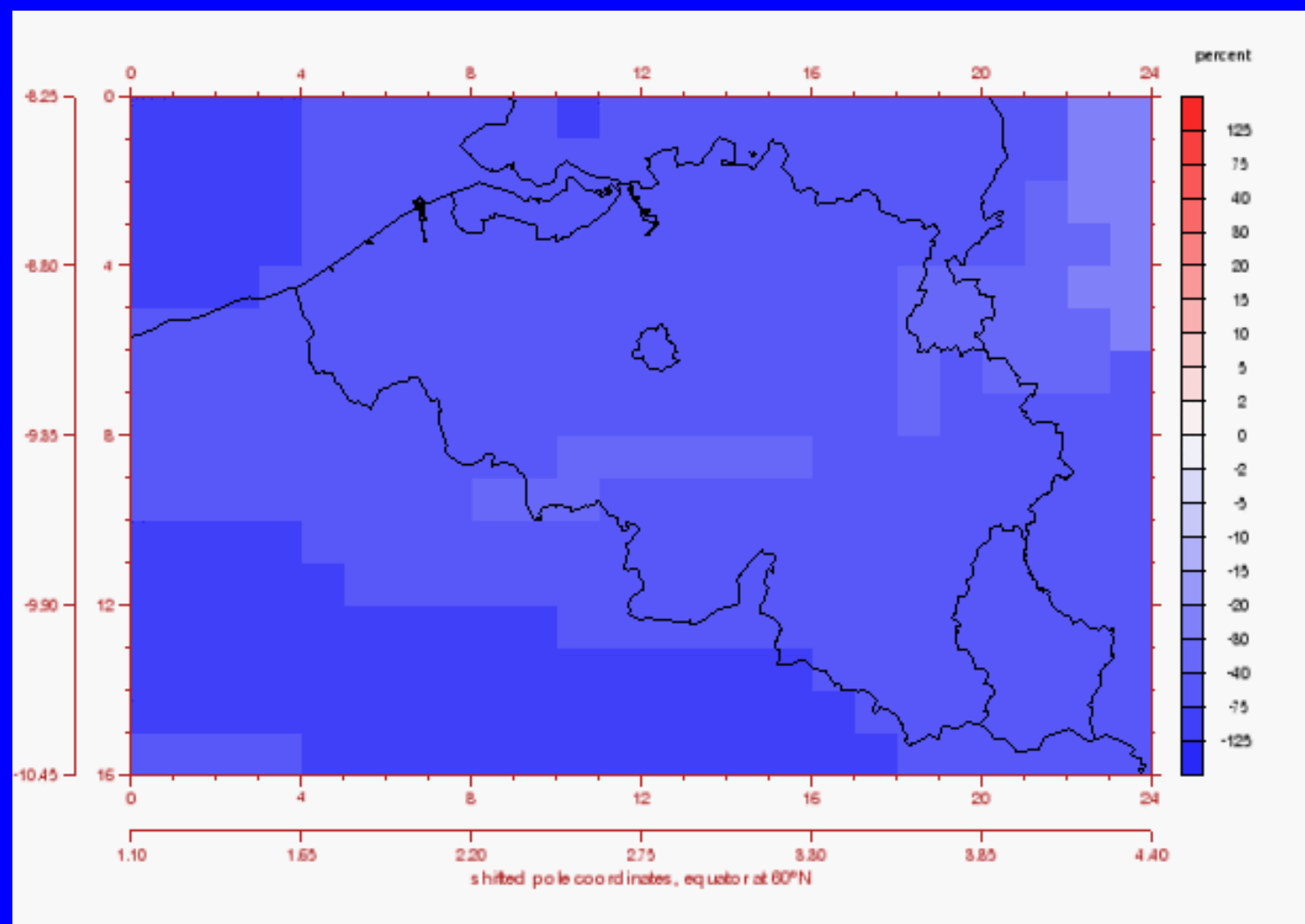
Simulation ozone smog episode, august 2003

Belgium : Relative difference (period 1/8 till 14/8) between AOT60 (emissions 1990) and AOT60 (emissions 1999)



Simulation ozone smog episode, august 2003

Belgium : Relative difference (period 1/8 till 14/8) between AOT60 (emissions 1999) and AOT60 (NEC, emissions 2010)



Simulation ozone smog episode, august 2003

Europe : Relative difference (period 1/8 till 14/8) between AOT60 (emissions 1999) and AOT60 (NEC emissions, 2010)

