

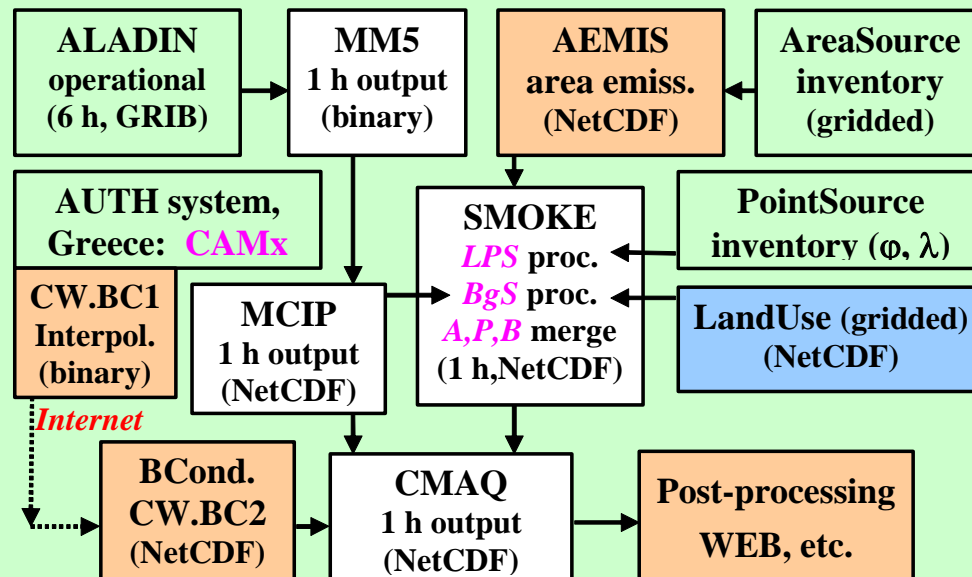
Examples of guidelines/applications of environmental technologies for the Revision of the AQD in Bulgaria

Operational Chemical Weather Forecast System for Bulgaria

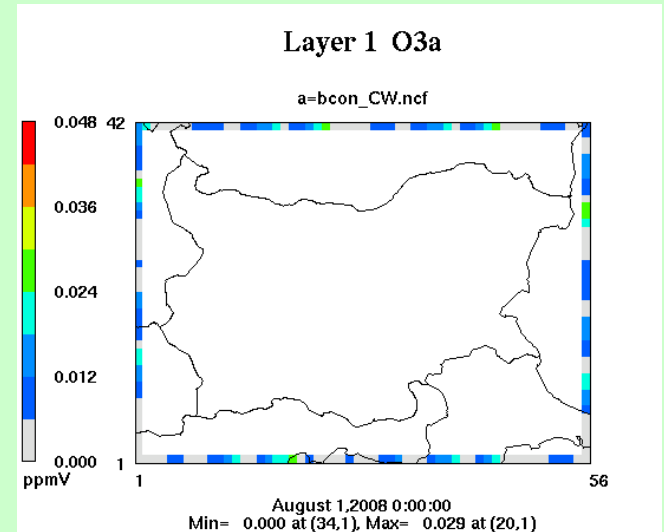
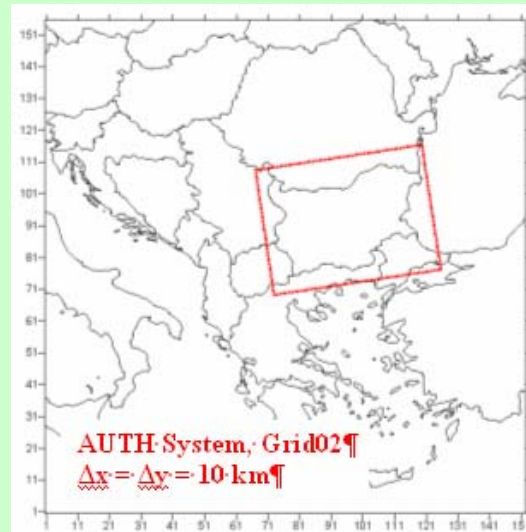
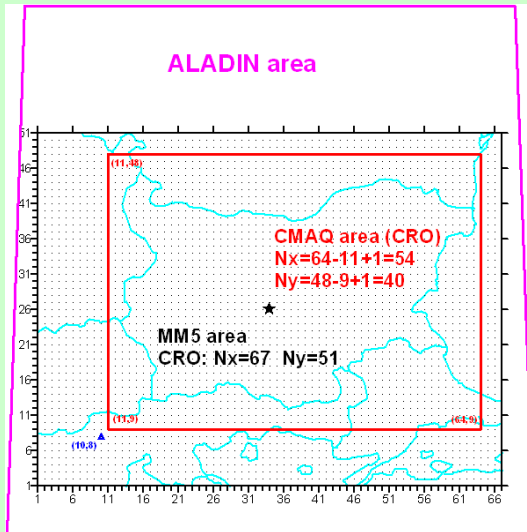
Dimiter Syrakov, Maria Prodanova, Iglia Etropolska

¹National Institute of Meteorology and Hydrology, Bulgarian Academy of Sciences,

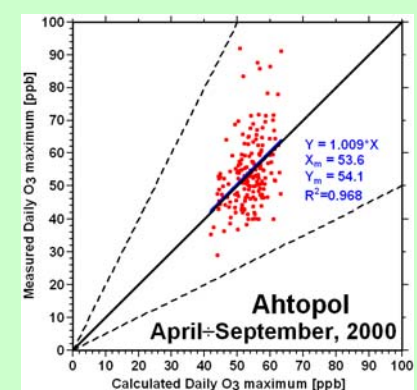
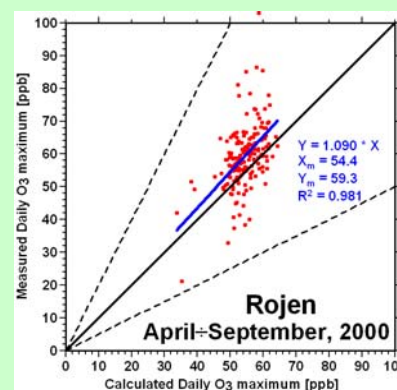
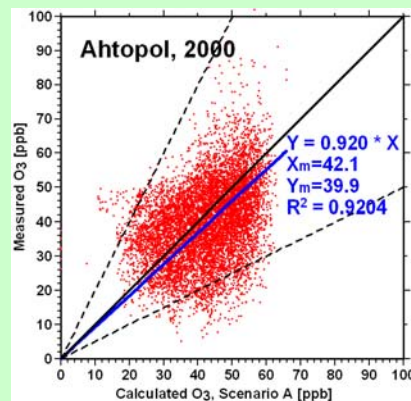
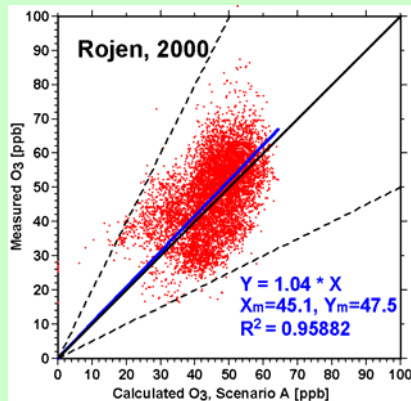
The US EPA Models-3 modeling system is used: **CMAQ, MM5, SMOKE**



Boundary conditions



VERIFICATION (measured vs. calculated)



O3 hourly values for 2000

O3 daily maxima for summer 2000

BgCW official web-site (at NIMH)
<http://info.meteo.bg/cw/frameset.html>

← → ↻ ☆ http://info.meteo.bg/cw/frameset.html

BULGARIAN ACADEMY OF SCIENCE
National Institute of Meteorology and Hydrology

Description of Bulgarian Chemical Weather Forecast and Information System (ver. 1.1)

POLLUTANTS

Nitrogen dioxide (NO₂)
[48-hours forecast](#)

Sulfur dioxide (SO₂)
[48-hours forecast](#)

OZONE
[48-hours forecast](#)
[First day](#)
[Daily maxima](#)
[8-hour daily maxima](#)
[Second day](#)
[Daily maxima](#)
[8-hour daily maxima](#)

PM10
[48-hours forecast](#)

Surface O₃
 file = CW_out.ncf

300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
mkg/m**3

1 54

June 4, 2010 0:00:00
 Min= 0 at (32,15), Max= 69 at (39,1)

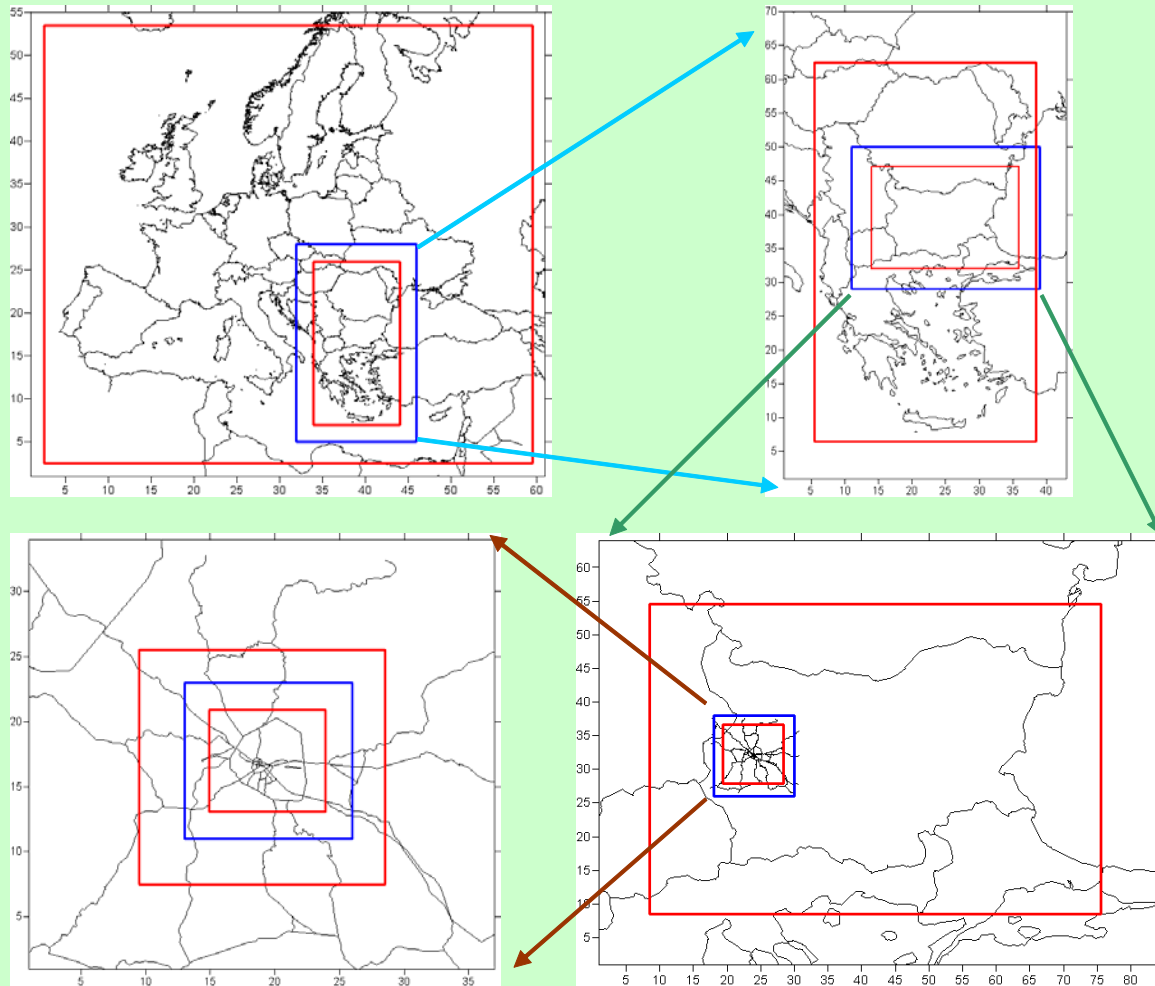
Local legislation for Ozone (O₃):
 Daily maximum (8-hour running average) threshold (D8T): 120 µg/m³
 Permitted number of exceedings of D8T in a year: 25 (mean for 3 years)
 Information threshold (hourly value): 180 µg/m³
 Alert threshold (hourly value): 240 µg/m³

1h
2h
3h
4h
6h
9h
12h
15h
18h
24h
30h
36h
42h
48h
Play

The System realization is funded by the National Science Fund at the Ministry of Education, Youth and Science of Bulgaria

Development of a new version: **WRF-CMAQ-SMOKE**

5 nested areas with resolution 81-27-9-3-1 km





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POLLUTANTS

Nitrogen dioxide (NO2)

72-hours forecast

Sulfur dioxide (SO2)

72-hours forecast

OZONE

72-hours forecast

First day

Daily maxima

8-hour daily maxima

Second day

Daily maxima

8-hour daily maxima

Third day

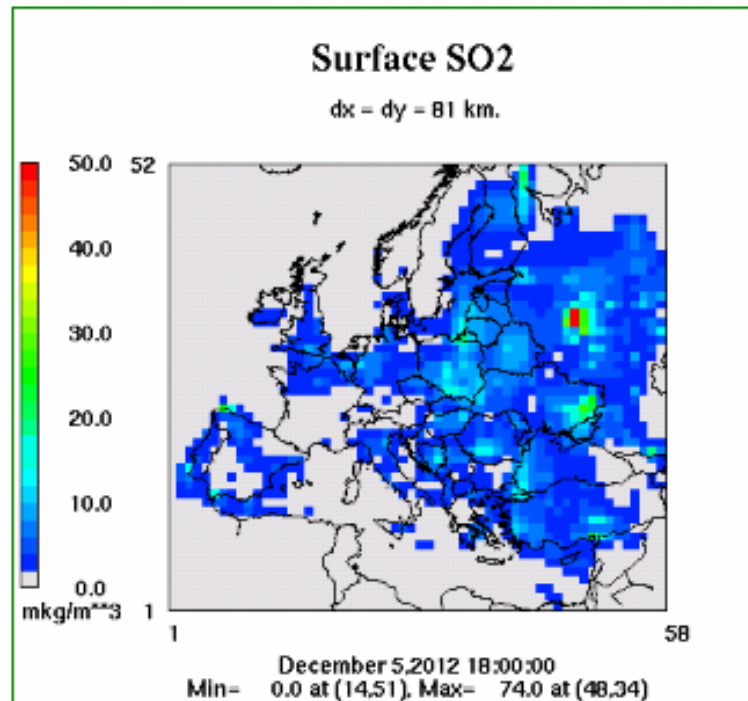
Daily maxima

8-hour daily maxima

PM10

72-hours forecast

[Description of Bulgarian
 Chemical Weather
 Forecast and Information
 System \(ver. 2.1\)\(PDF\)](#)



Bulgarian legislations for Sulfur Dioxide (SO2):
 Hourly threshold value (HT): 350 µg/m3
 Permitted number of exceedings of HT in a year: 24
 Daily threshold value (DT): 125 µg/m3
 Permitted number of exceedings of DT in a year: 3
 Alert threshold (hourly value): 500 µg/m3

+1h
+6h
+12h
+18h
+24h
+30h
+36h
+42h
+48h
+54h
+60h
+66h
+72h
Play

DOMAINS



Funded by the **National Science Fund of Bulgaria**



BULGARIAN ACADEMY OF SCIENCE
National Institute of Meteorology and Hydrology



POLLUTANTS

Nitrogen dioxide (NO2)

72-hours forecast

Sulfur dioxide (SO2)

72-hours forecast

OZONE

72-hours forecast

First day

Daily maxima

8-hour daily maxima

Second day

Daily maxima

8-hour daily maxima

Third day

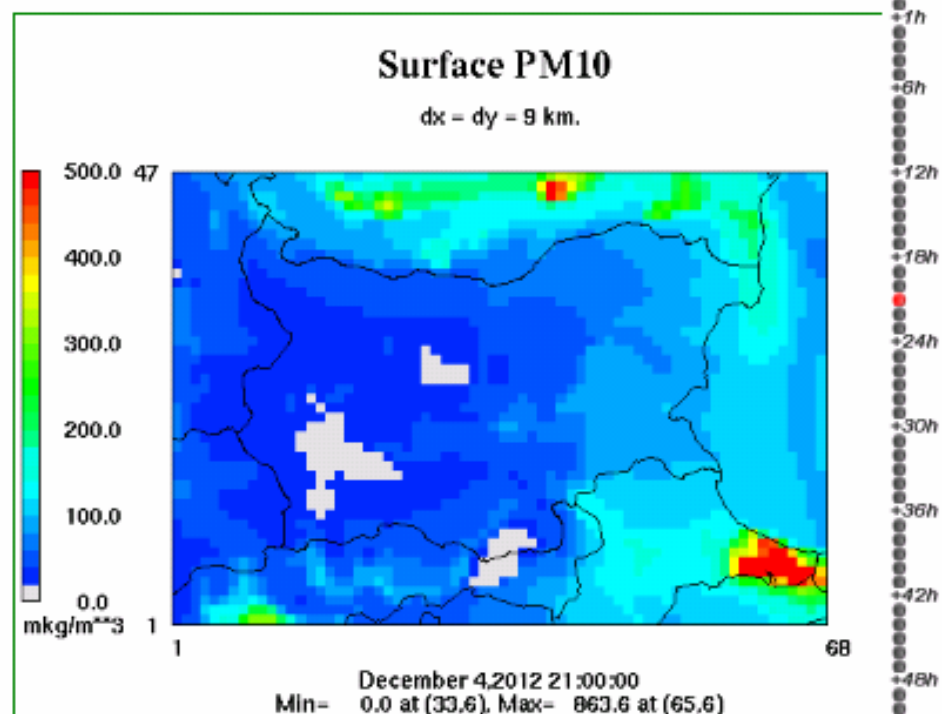
Daily maxima

8-hour daily maxima

PM10

72-hours forecast

[Description of Bulgarian
Chemical Weather
Forecast and Information
System \(ver. 2.1\)\(PDF\)](#)



Bulgarian legislation for Fine Particulate Matter (PM10):
Daily threshold value (DT): 50 µg/m³
Permitted number of exceedings of DT in a year: 35
Yearly threshold value (YT): 40 µg/m³
Permitted number of exceedings of YT: impermissible

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-1h
-6h
-12h
-18h
-24h
-30h
-36h
-42h
-48h
-54h
-60h
-66h
-12h
Play



BULGARIAN ACADEMY OF SCIENCE
National Institute of Meteorology and Hydrology



POLLUTANTS

Nitrogen dioxide (NO₂)

72-hours forecast

Sulfur dioxide (SO₂)

72-hours forecast

OZONE

72-hours forecast

First day

Daily maxima

8-hour daily maxima

Second day

Daily maxima

8-hour daily maxima

Third day

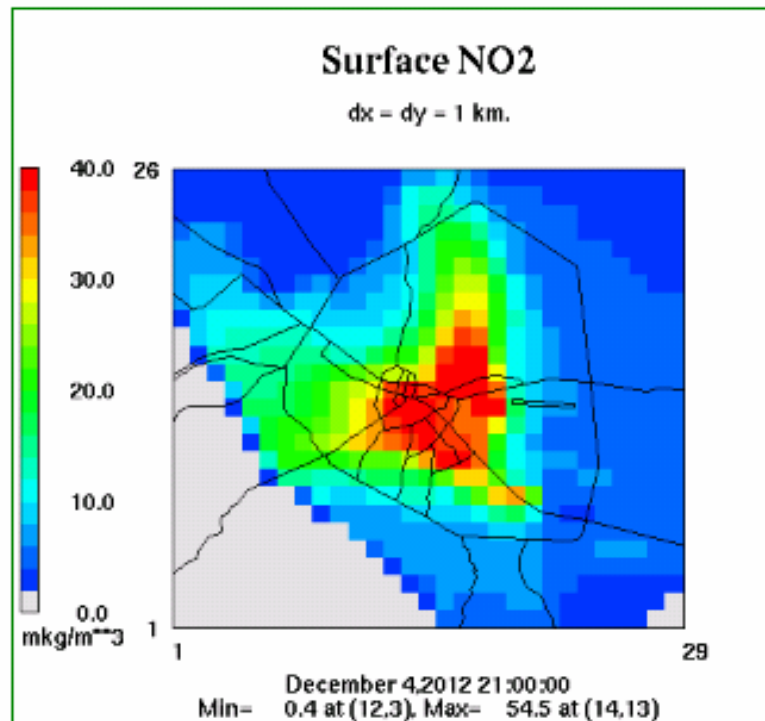
Daily maxima

8-hour daily maxima

PM₁₀

72-hours forecast

[Description of Bulgarian
Chemical Weather
Forecast and Information
System \(ver. 2.2\)\(PDF\)](#)



Bulgarian legislation for Nitrogen Dioxide (NO₂):

Hourly threshold value (HT): 200 µg/m³

Permitted number of exceedings of HT in a year: 18

Yearly threshold value (YT): 40 µg/m³

Permitted number of exceedings of YT: impermissible

Alert threshold (hourly value): 400 µg/m³

+1h
+6h
+12h
+18h
+24h
+30h
+36h
+42h
+48h
+54h
+60h
+66h
+12h
Play

DOMAINS



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Science Fund of Bulgaria**