

BTX DISTRIBUTION EVOLUTION BETWEEN 1999 AND 2001 in TOULOUSE, France.

S. OLIVIER*, M. MEYBECK*, J.P. DELLA MASSA*, M. BAER**, V. SIMON ** and L. TORRES **.

* ORAMIP, 19 Avenue Clément Ader, 31770 Colomiers - France - contact@oramip.org

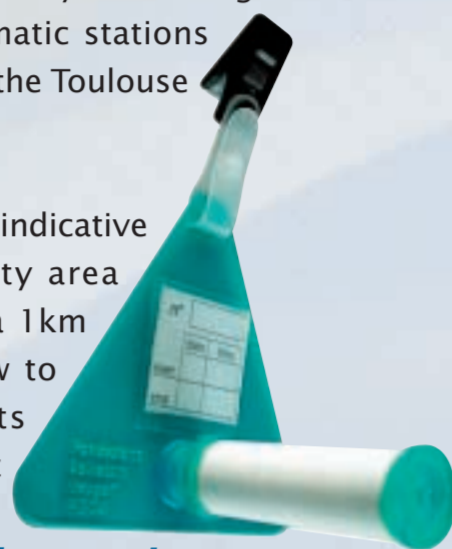
** ENSIACET, Equipe Chimie Energie et Environnement, 118 Route de Narbonne, 31077 Toulouse -France - vsimon@ensct.fr

Monitoring air quality in the Midi-Pyrénées region.

Created in 1976, ORAMIP is the Observatory in charge of monitoring ambient air quality throughout the Midi-Pyrenees region, the largest region in France. Its air quality monitoring network is composed of 30 automatic stations (including 18 automatic stations in the Toulouse urban area).

These automatic measurements are indicative of a more or less wide air quality area (maximum of 3,14 km² area i.e. a 1km radius circle) and they don't allow to estimate everywhere pollutants distribution on an area. To carry out such studies, another measuring technique is used : *passive diffusive samplers*.

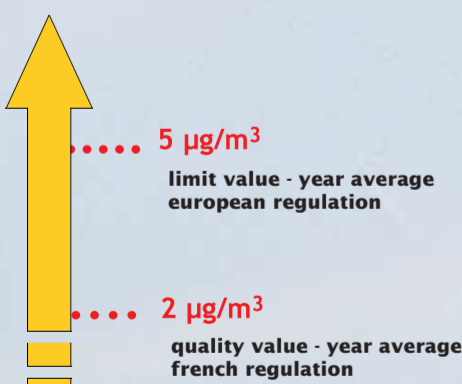
Due to their low cost and the simplicity of their positioning, it is possible to multiply the number of measurement points, and hence to obtain a *pollutant distribution map*.



During 4 weeks between may and july 1999, background BTX (Benzene, Toluene, Xylenes) average concentration measurement campaign has been lead over the urban agglomeration of Toulouse by diffusive sampling. A second campaign has been carried out in 2001 following the same procedure. These campaigns have allowed to appraise BTX concentration evolution between 1999 and 2001.

Benzene Toluene Xylenes Regulation

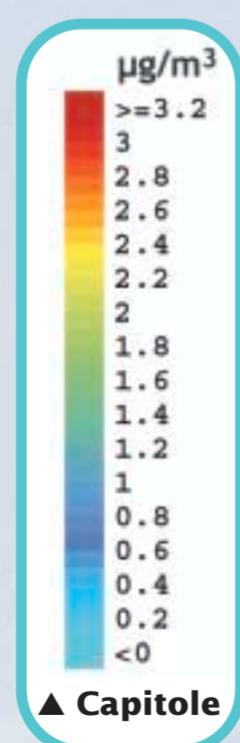
Benzene, Toluene and Xylenes are coming from automotive exhausts. They are notably toxic to human health (Benzene is a carcinogenic atmospheric compound) and can also generate secondary pollutants.



**On January 1st, 2000,
benzene allowable rate
in gasoline went down
from 5% to 1%.**

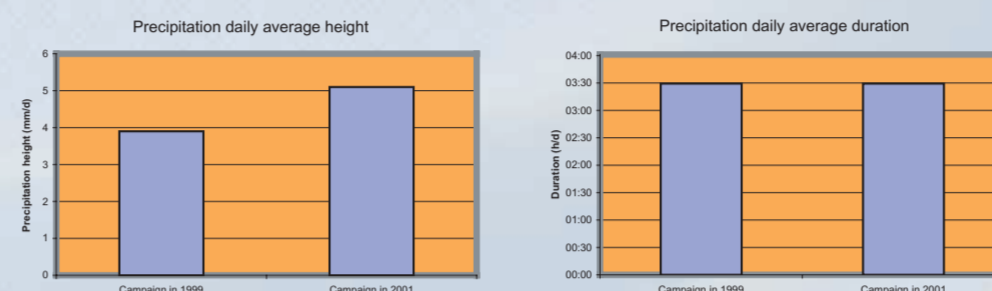
Toluene and Xylenes are not regulated in Europe.

In order to evaluate the evolution of atmospheric background average BTX concentrations over Toulouse (about 250 km²) between 1999 and 2001, **four diffusive sampling campaigns were lead** (about sixty samplers spread over) **during about twenty days between may and july 1999 and 2001 following the same procedure.**

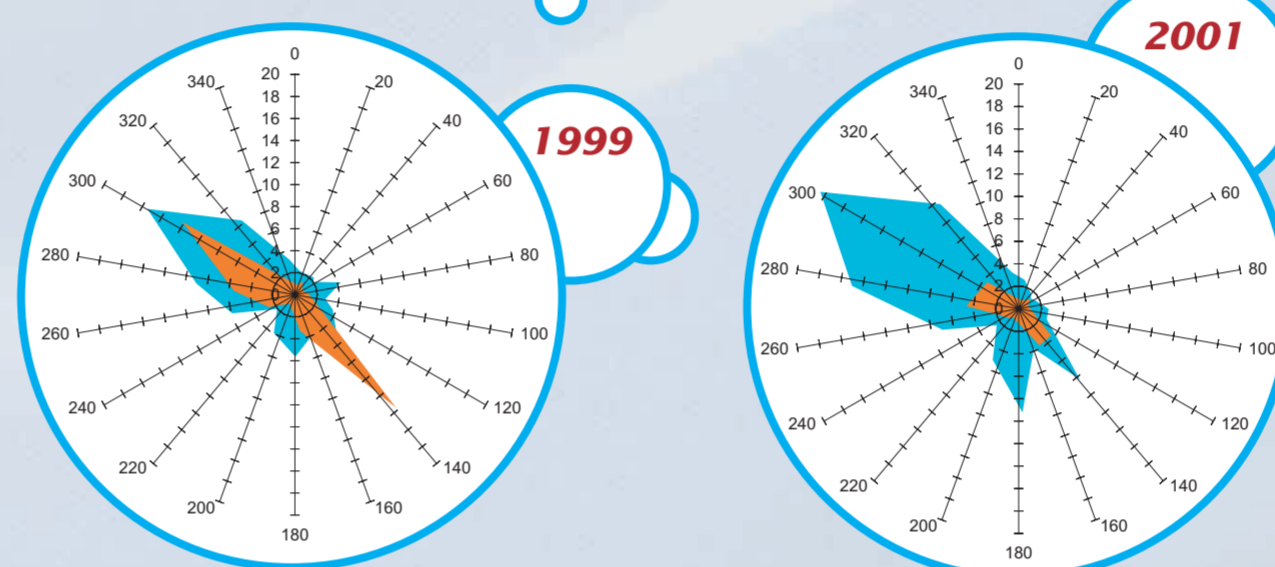


Meteorological conditions

Meteorological conditions have a great influence on pollutant spatial distribution and on pollutant concentrations.



Precipitations did not allow a more important atmosphere washing for one or another campaign.



For both periods, main wind directions followed a northwest to south-east line: it is the usual wind configuration in Toulouse. The 1999 period was marked by a wind speed more important.

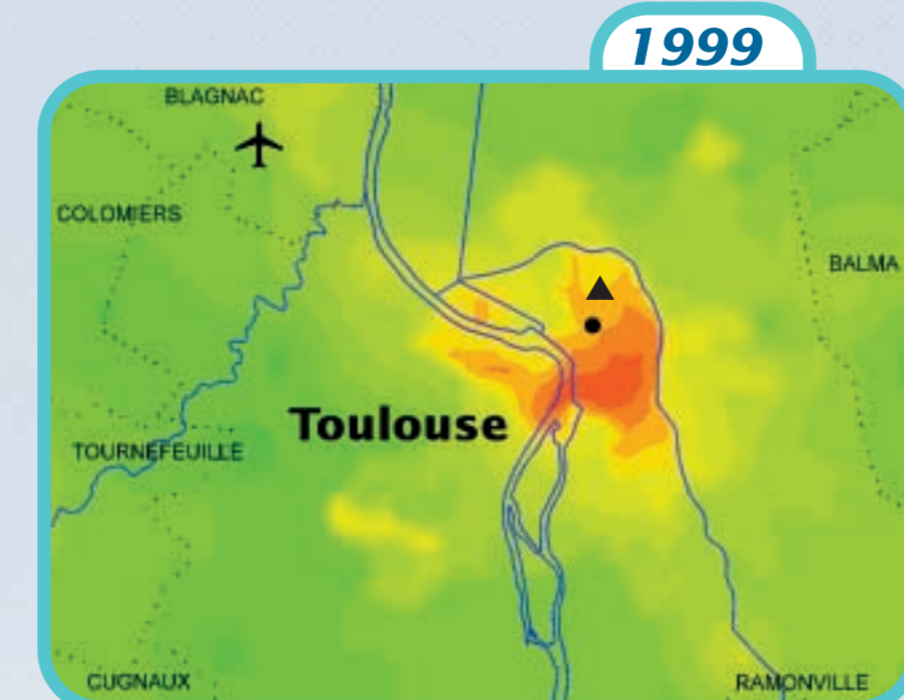
Results

For both campaigns, benzene concentrations are maximum in downtown Toulouse and decrease progressively toward the periphery. The highest concentration zones seem to follow a northwest to south-east line corresponding to wind axis.

For the 2001 period, benzene average concentrations have been divided by two compared to 1999 whereas toluene and xylene concentrations are approximately the same (the wind speed more important in 1999 doesn't seem to have favoured a better pollutant dispersion). Thus, for the 2001 study period, the benzene allowable rate decrease in gasoline has had a significant effect on benzene concentrations in ambient air in Toulouse.

1999

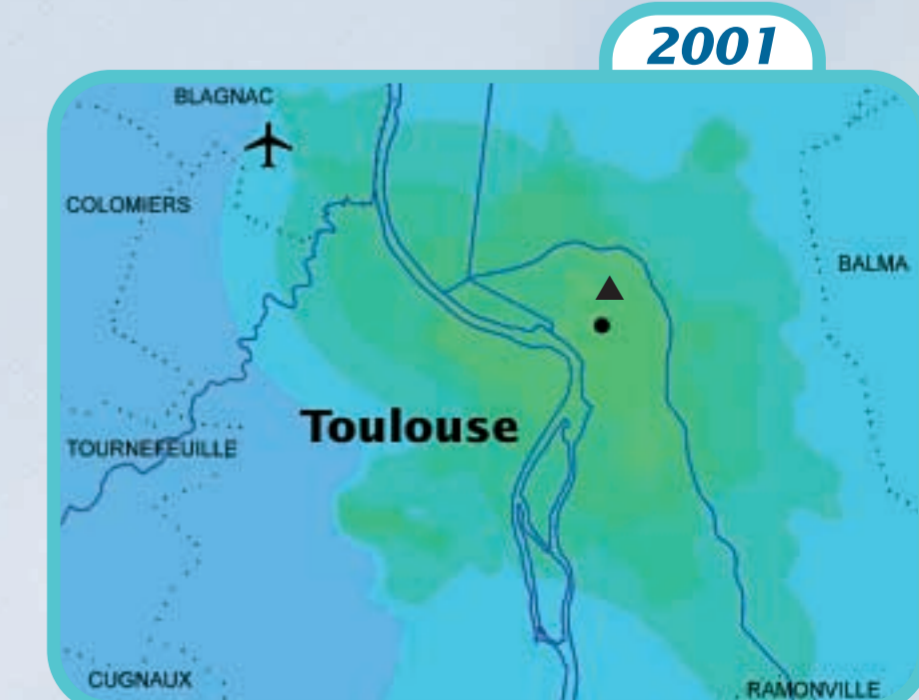
(µg/m ³)	Benzene	Toluene	MP Xylene	O xylene	All Xylenes	All BTX
Average concentration	2.0	6.6	3.7	1.2	4.9	11.0
Standard deviation	0.7	2.5	1.5	0.5	1.9	4.1
Maximum value	3.8	14.1	8.0	2.7	10.6	23.1
Minimum value	1.1	3.0	1.6	0.6	2.2	5.1



may, 5th to 26th June, 14th to july, 2nd

2001

(µg/m ³)	Benzene	Toluene	MP Xylene	O xylene	All Xylenes	All BTX
Average concentration	1.1	6.1	4.0	1.3	5.3	10.0
Standard deviation	0.3	2.1	1.5	0.5	2.0	3.4
Maximum value	2.0	11.9	8.4	2.7	11.0	19.7
Minimum value	0.7	3.0	1.6	0.6	2.1	5.0



may, 2nd to 22nd June, 13th to july, 4th



Toulouse:
the fifth urban area in France
351 822 inhabitants (Toulouse)
378 585 inhabitants (study area)

