

A.J. Leekstra & G.J.C. Stolwijk

Pollutant Emission Register in the Netherlands

1. PER in the Netherlands
2. Overall process
3. Workflow and data-processing
4. Public website (demonstration)



**Netherlands Environmental
Assessment Agency**

Introduction

Netherlands Environmental
Assessment Agency

- Evaluating policy
- NIR, Environmental Balance,
Environmental data compendium
- Emission Registration (PER)



**Netherlands Environmental
Assessment Agency**

Data in the PER

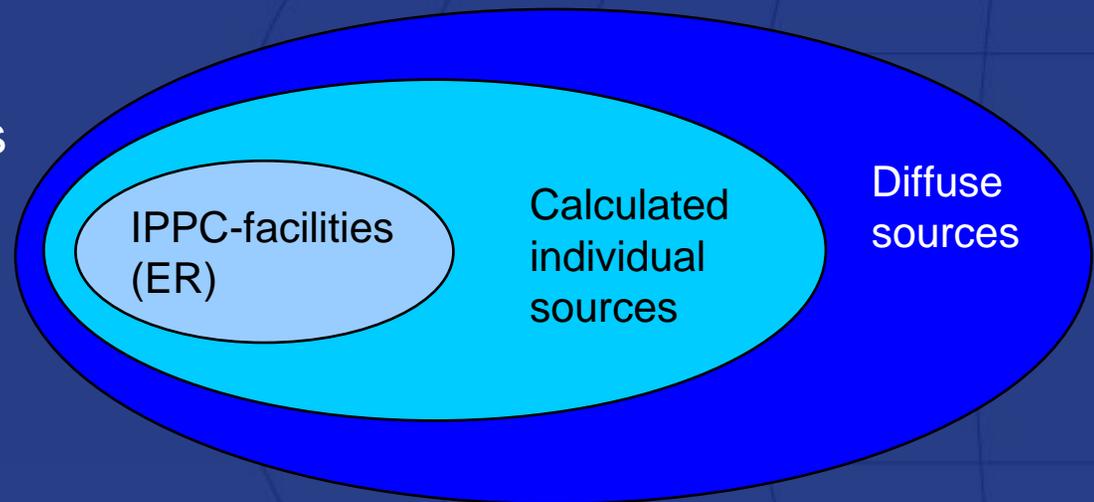
Emissions of 800 point sources
(IPPC facilities, Emission
reports (ER's))

1200 source categories with
national totals and activity levels

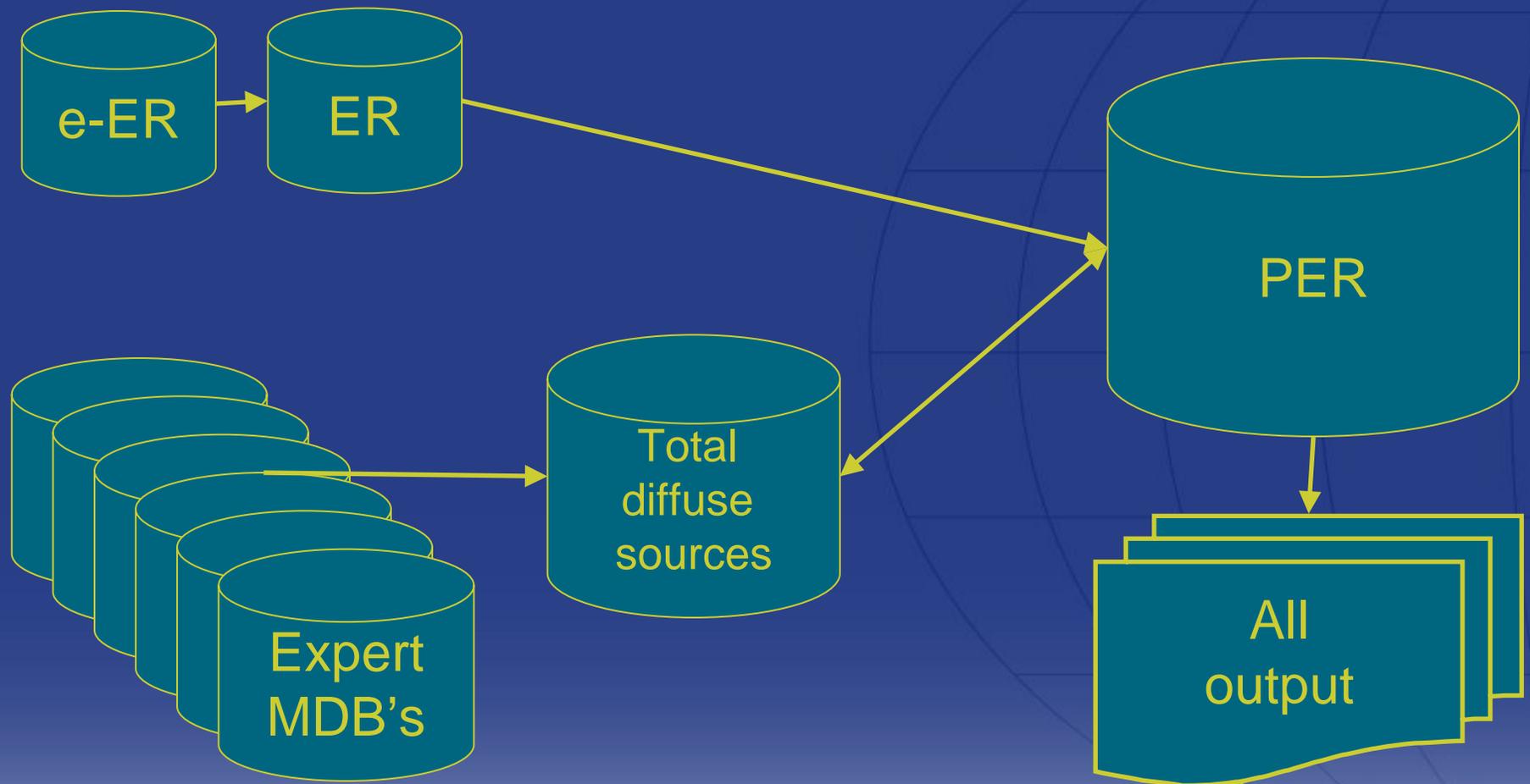
Divided into 55 work packages (14
emission experts)

5 Task Forces:

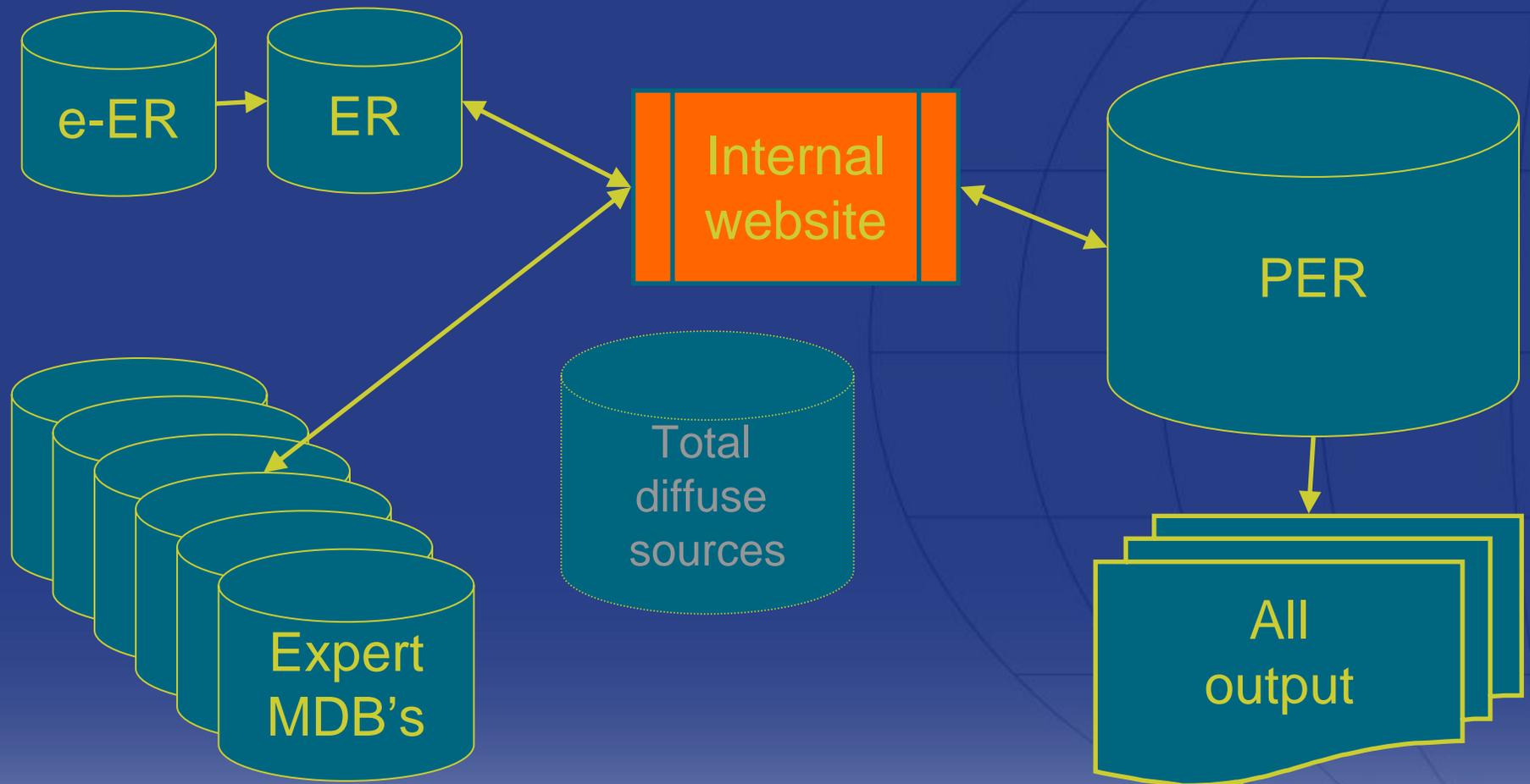
- Energy sector, industry, waste
- Agriculture
- Transport
- Water
- Consumers



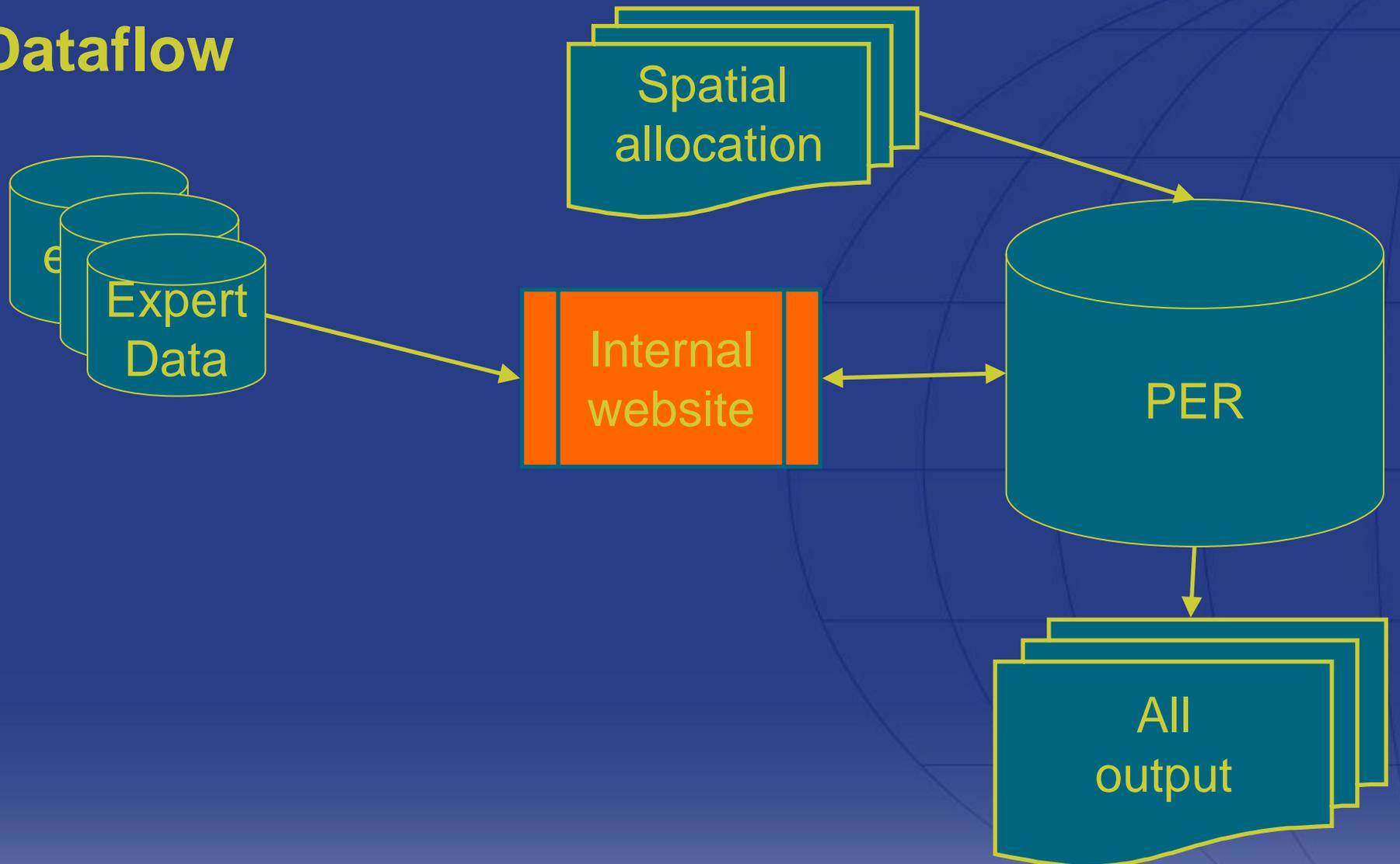
Dataflow



Dataflow



Dataflow

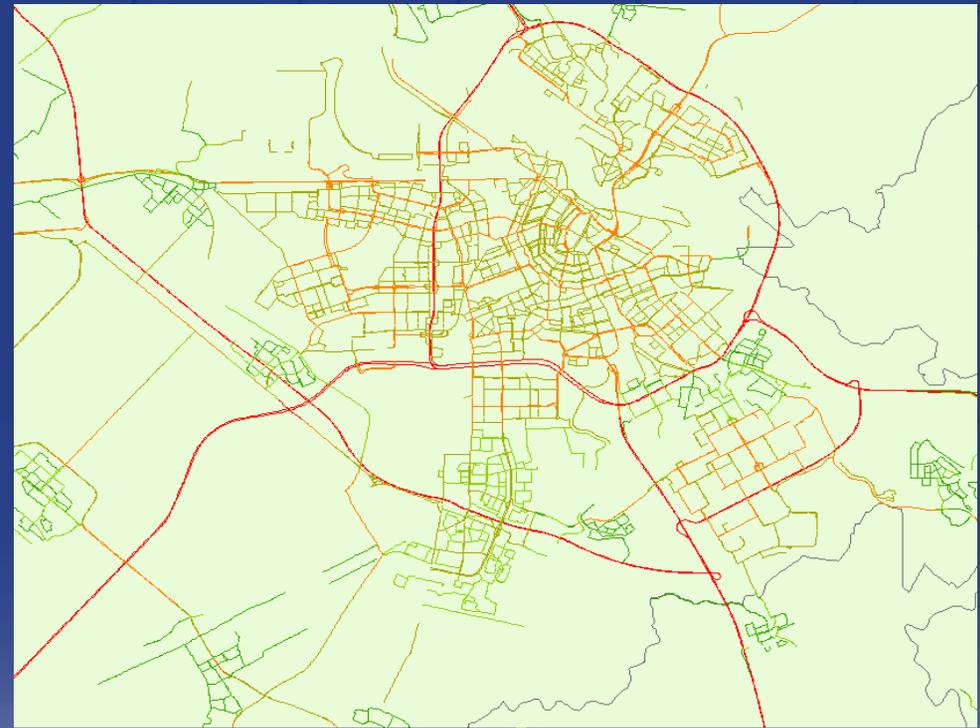


**Netherlands Environmental
Assessment Agency**

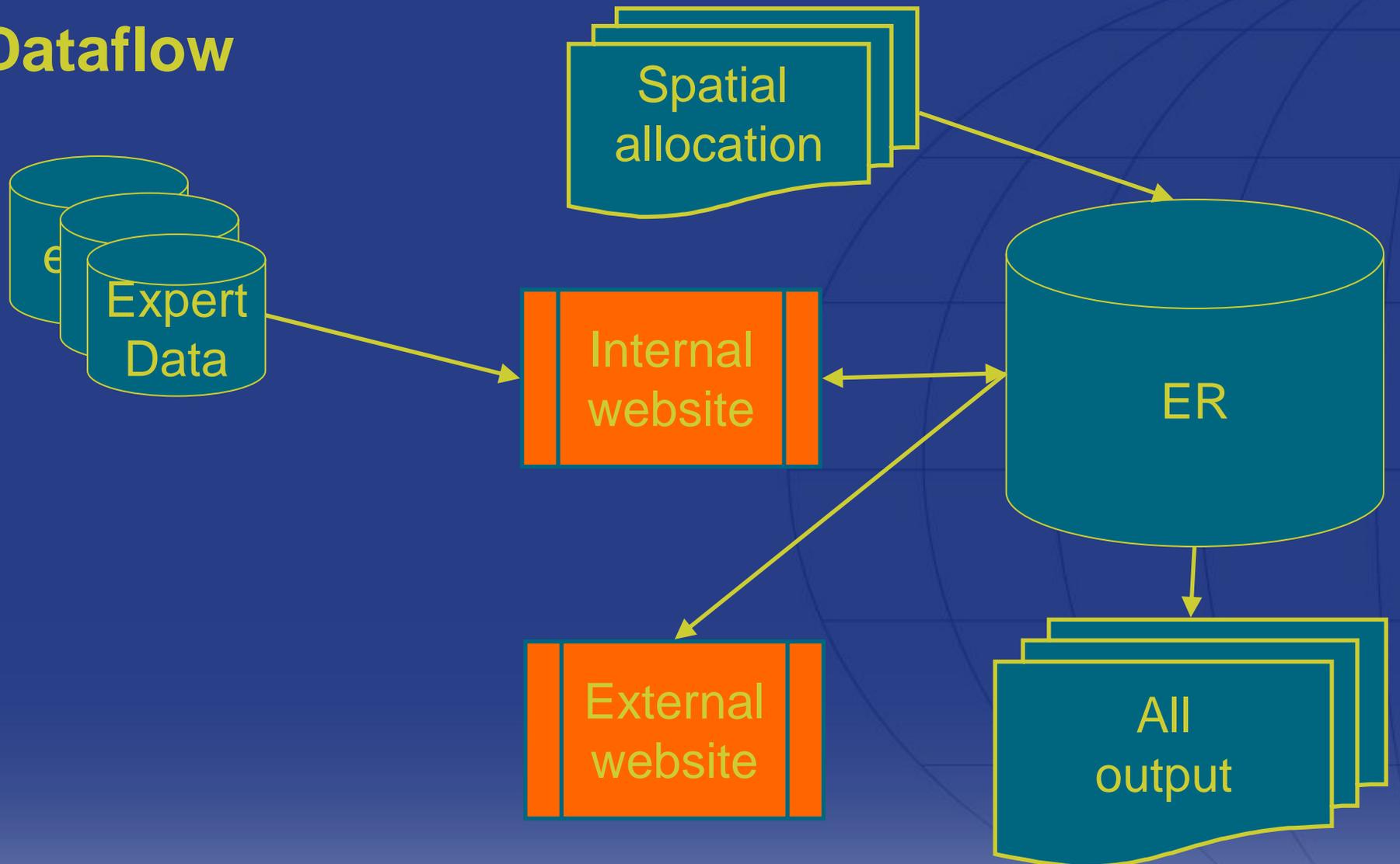
Spatial allocation

- Geographical location (i.e. Road database, Land use map, facility locations)
- Activity level (i.e. Traffic intensity, Grassland used for cattle, amount of fuel used)

National Road Database 2005

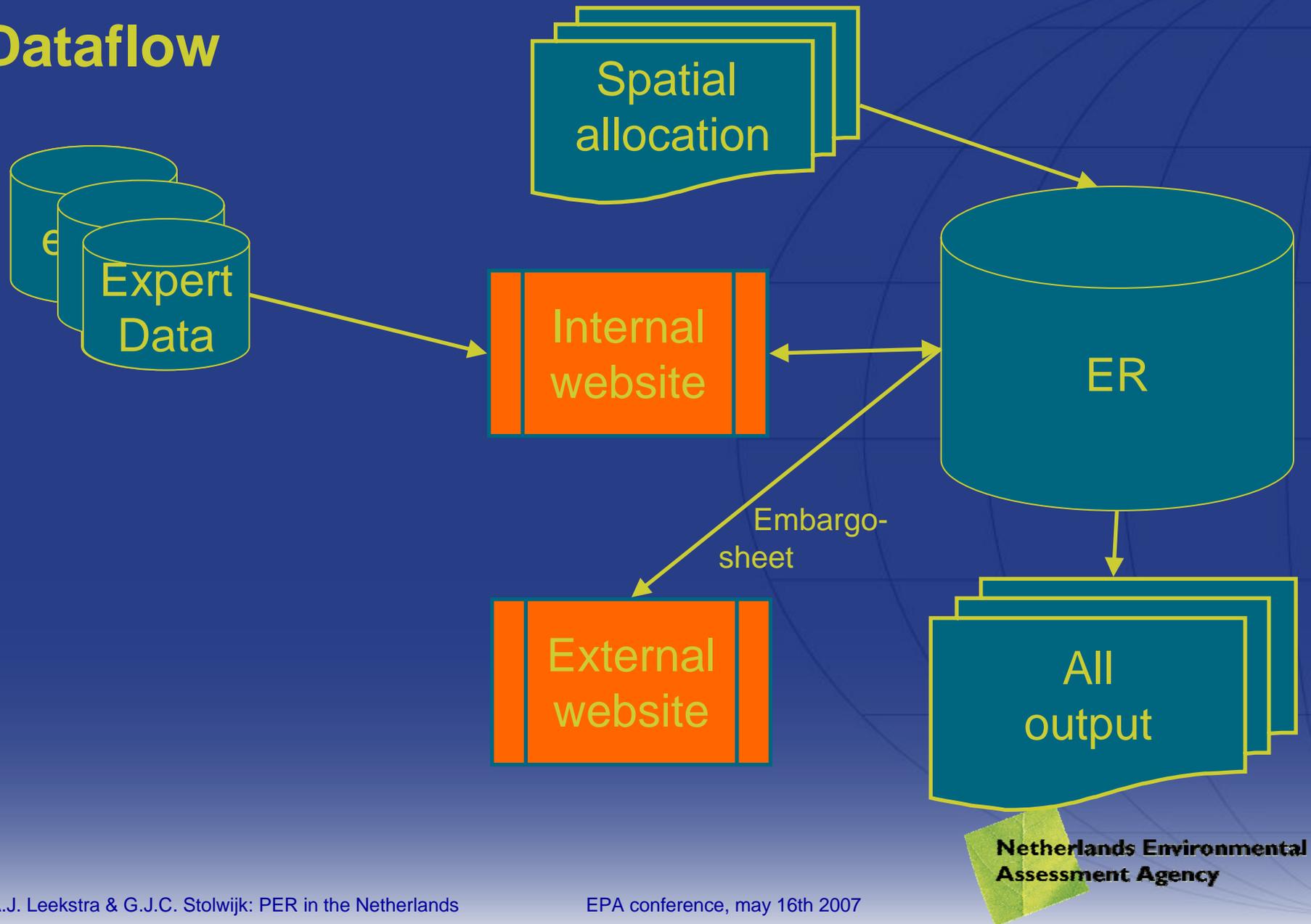


Dataflow

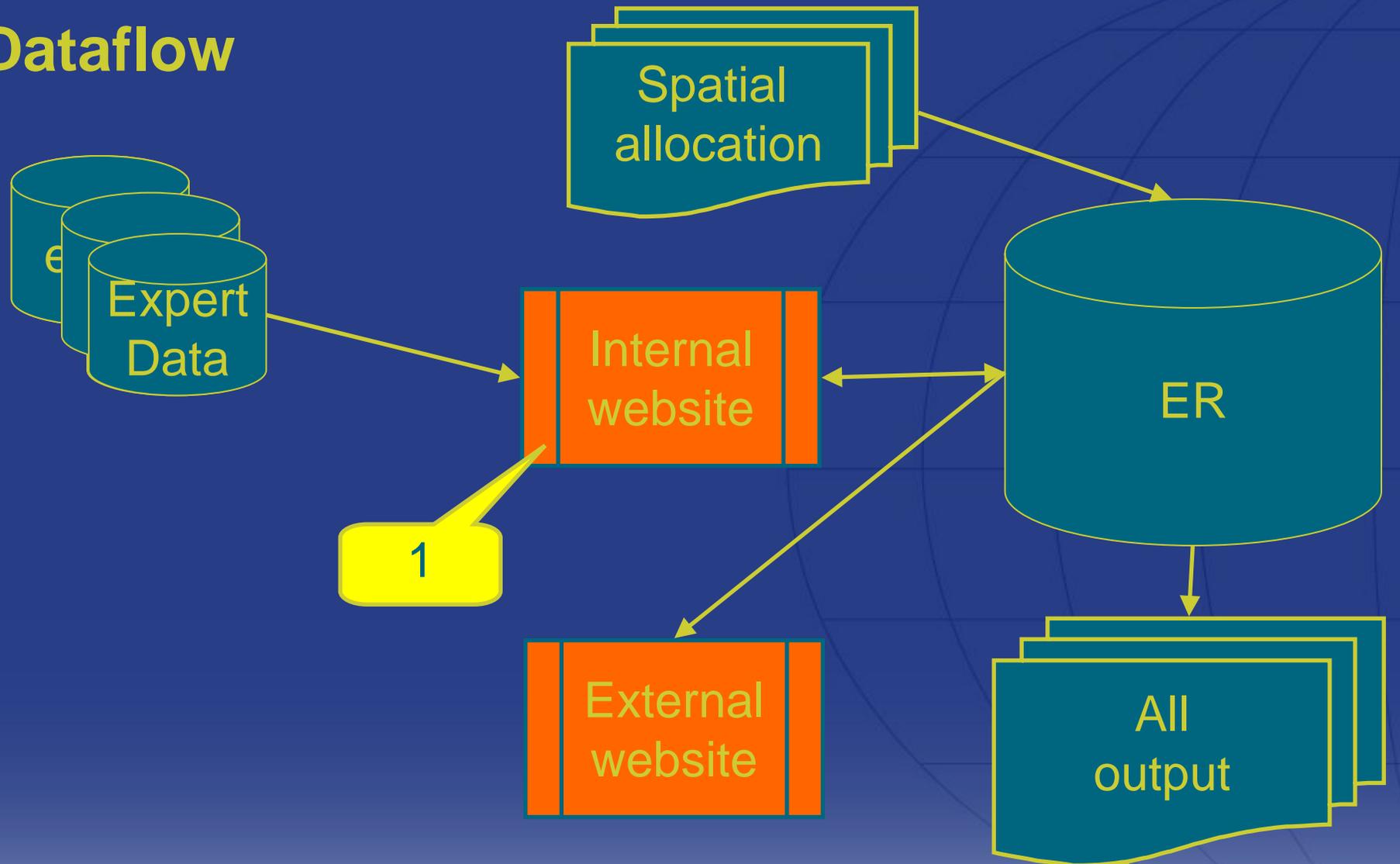


**Netherlands Environmental
Assessment Agency**

Dataflow



Dataflow



Netherlands Environmental Assessment Agency

Internal website

- Only accessible by PER-partners
- Down- en Uploads by the Emission Experts
 - Only the expert can upload it's work package
 - Automated checks
 - Automated logging of all uploads

Emission Explorer

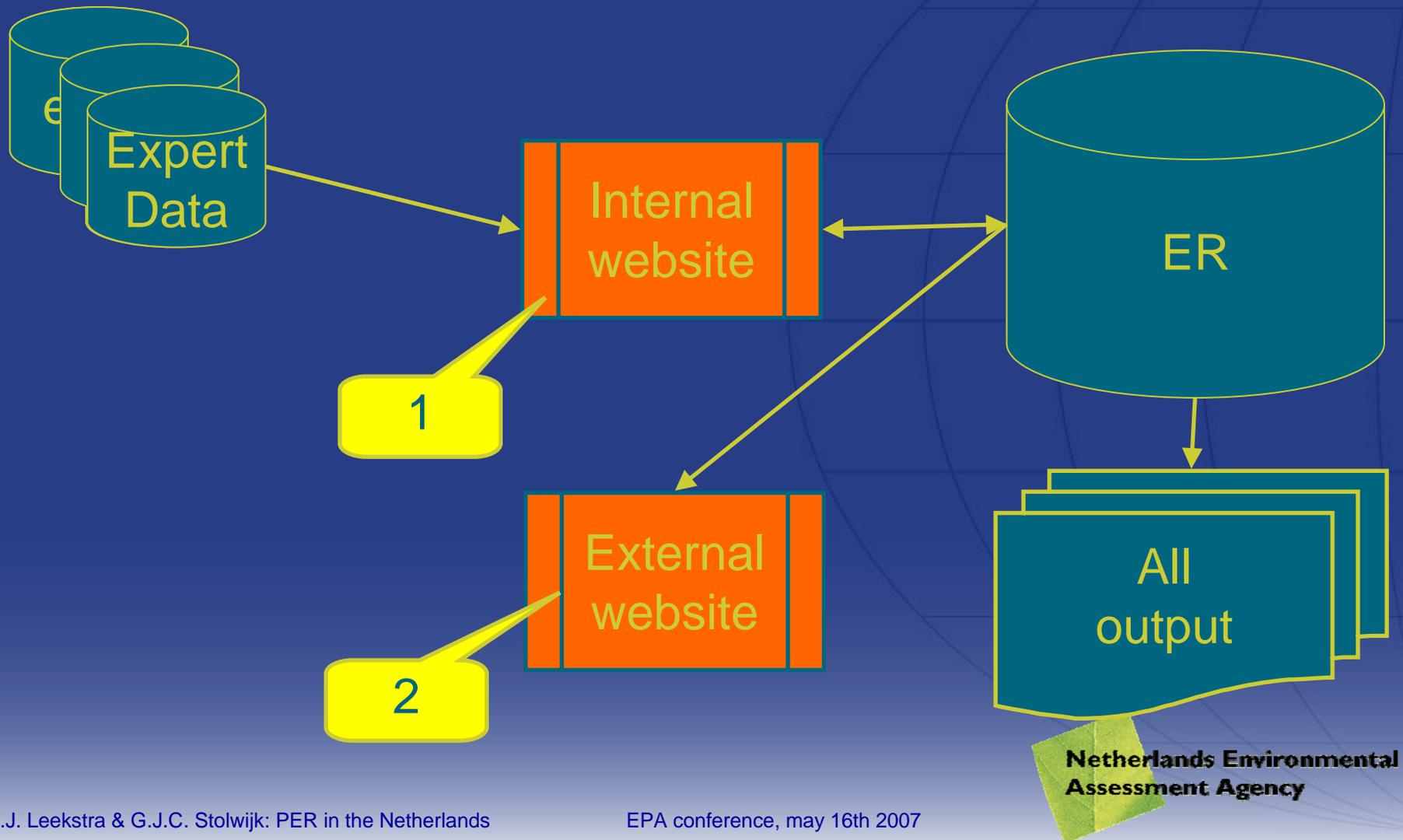
- To compare datasets in graphics or tables
- To check on completeness
- To analyze trends
 - Hierarchical on all source levels
 - In emissions
 - In activity data
- To export data

1

Emission Calculations

- Create specific spatial allocated reports
 - General public
 - Journalists
 - External emission experts
- Create output for our annual reports

Dataflow



Public website

To inform the public about emission sources in their neighborhood (and, by doing that, increasing the involvement of the public in the validation of emission data)

- Bilingual (English and Dutch)
- Integrated system of point sources and diffuse sources
- Integrated compartments (air, soil, water indirect and direct)
- Maps per emission source, 5*5 km grid, per community, water catchment area etc.
- Emission Explorer, no activity data
- Methodologies used
- Detailed exports

2

Public website

- Demonstration

www.emissieregistratie.nl

Emission Register - Windows Internet Explorer

http://www.emissieregistratie.nl/erpubliek/bumper.en.aspx

Emission Register

Home Information Help

Emissieregistratie

Nederlandse versie

Introduction

[How to use this website](#)
[General explanation](#)
[How to use emissions](#)

Preselected graphics

-- choose a graphic

Preselected maps

-- choose map

the Netherlands
 Postalcode

Make your graphic or map

[Select pollutants, sources ...](#)

Documentation

[All documents](#)
[Search in documents](#)
[Glossary](#)
[Related links](#)

Release of pollutants to air, water and soil in the Netherlands

This website shows the yearly releases (emissions) of the most important pollutants in the Netherlands. You can exploit these emissions in various ways: in a map, as a graphic or in a table. But you can also download all the details in your own database. [More about the use of this website ...](#)

The project Emission Register

Since 1974 a number of [organisations](#) work closely together in order to collect and decide on the yearly release of pollutants to air, water and soil in the Netherlands. The results of this project underpins the national environmental policy. It delivers also the data for the many environmental [reports](#) to international organisations like the European Union and the UN, e.g. the National Inventory Report for the Kyoto protocol.

Method

National emissions are aggregated from the reported releases from individual companies (facilities) and the total releases from more diffuse activities like agriculture, traffic, small companies and natural sources. The diffuse emissions are spatially allocated using activity maps, e.g. the releases from road traffic with a map of the intensity of transport for each road. The menu-item [documentation](#) shows background information about the used methodologies, protocols and factsheets, the accuracy and uncertainties of the emissions itself and the EU regulations on which the inventories are based. [More about the method](#)

Up to date

The data shown in this website is updated 2 to 3 times each year. The current release shows detailed emissions on a national level of 2004. Emissions of individual companies will be added in May 2007. September 2007 we expect to publish the 2005 emissions. You can send us a [update-mail](#) if you want to be informed of updates of this website.

Done Local intranet 100%

[Nederlandse versie](#)

Introduction

- [How to use this website](#)
- [General explanation](#)
- [How to use emissions](#)

Preselected graphics

-- choose a graphic

Preselected maps

-- choose map

- choose map
- Air pollutants per community**
- Load per surface water
- Load per catchment area
- Emissions per surface water
- Emissions per catchment area
- To soil per 5*5 km2

Documentation

- [All documents](#)
- [Search in documents](#)
- [Glossary](#)
- [Related links](#)

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selection presentation export settings

graph map

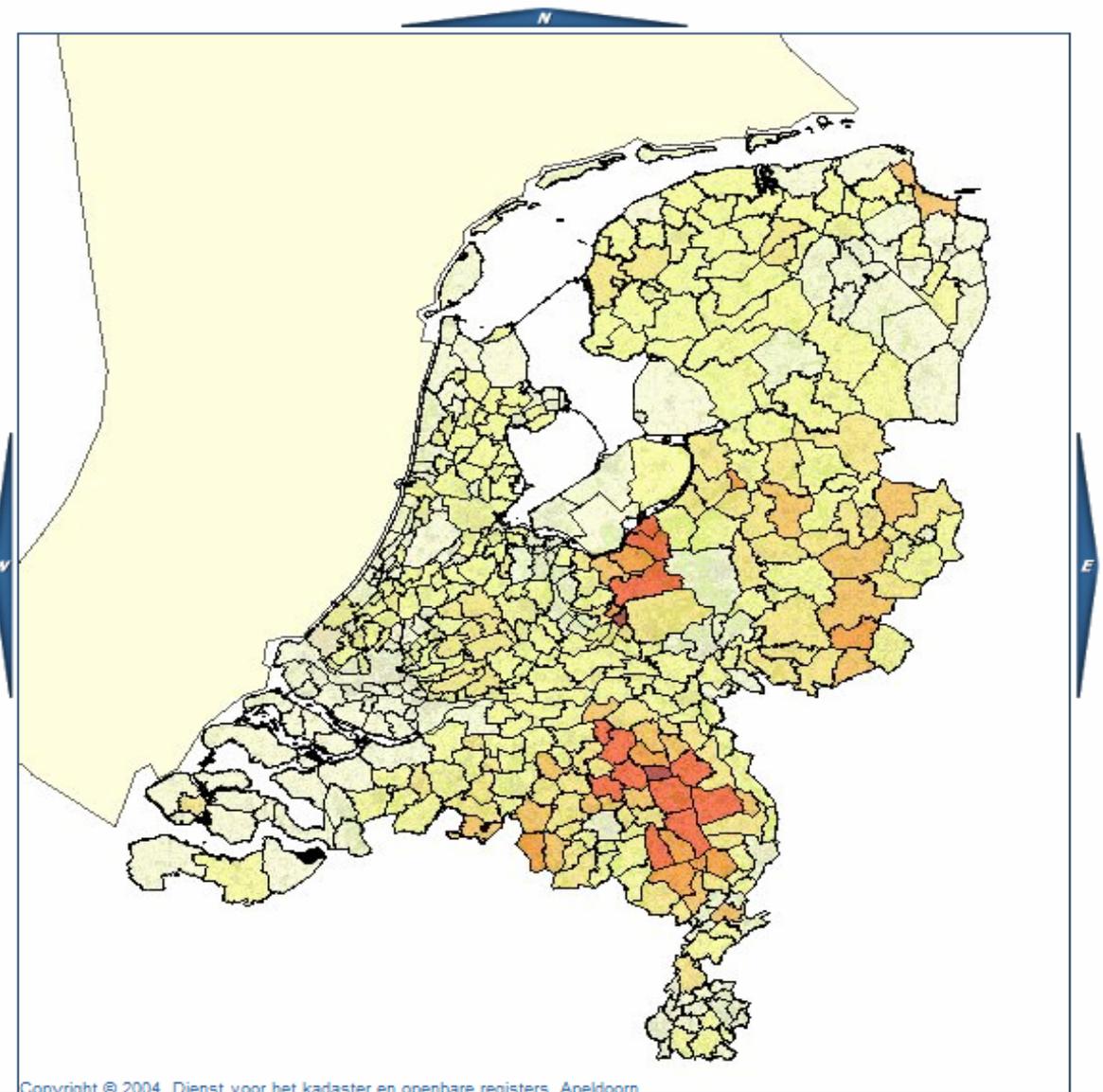
Community [v]
2004 [v]
Ammonia [v]
Air [v]
Total [v]
Topographic map as backgroundla [v]
Classification: equal interval [v]
Emissions per km2
Facilities:
Refresh Map



Postalcode (4 positions)
 Community
[input] Search
[input]

Community (kg/km2)

0 - 2300 (157)
2300 - 4600 (202)
4600 - 6900 (65)
6900 - 9200 (20)
9200 - 11500 (10)
11500 - 13800 (12)
13800 - 16100 (0)
16100 - 17700 (2)



selection presentation export settings

graph map

Community

2004

Ammonia

Ammonia
Dinitrogen oxide
Fine dust (PM10)
Carbon dioxide
Methane
Non-methane VOS
Oxides of nitrogen (as NO₂)
Oxides of sulphur (as SO₂)

Facilities:

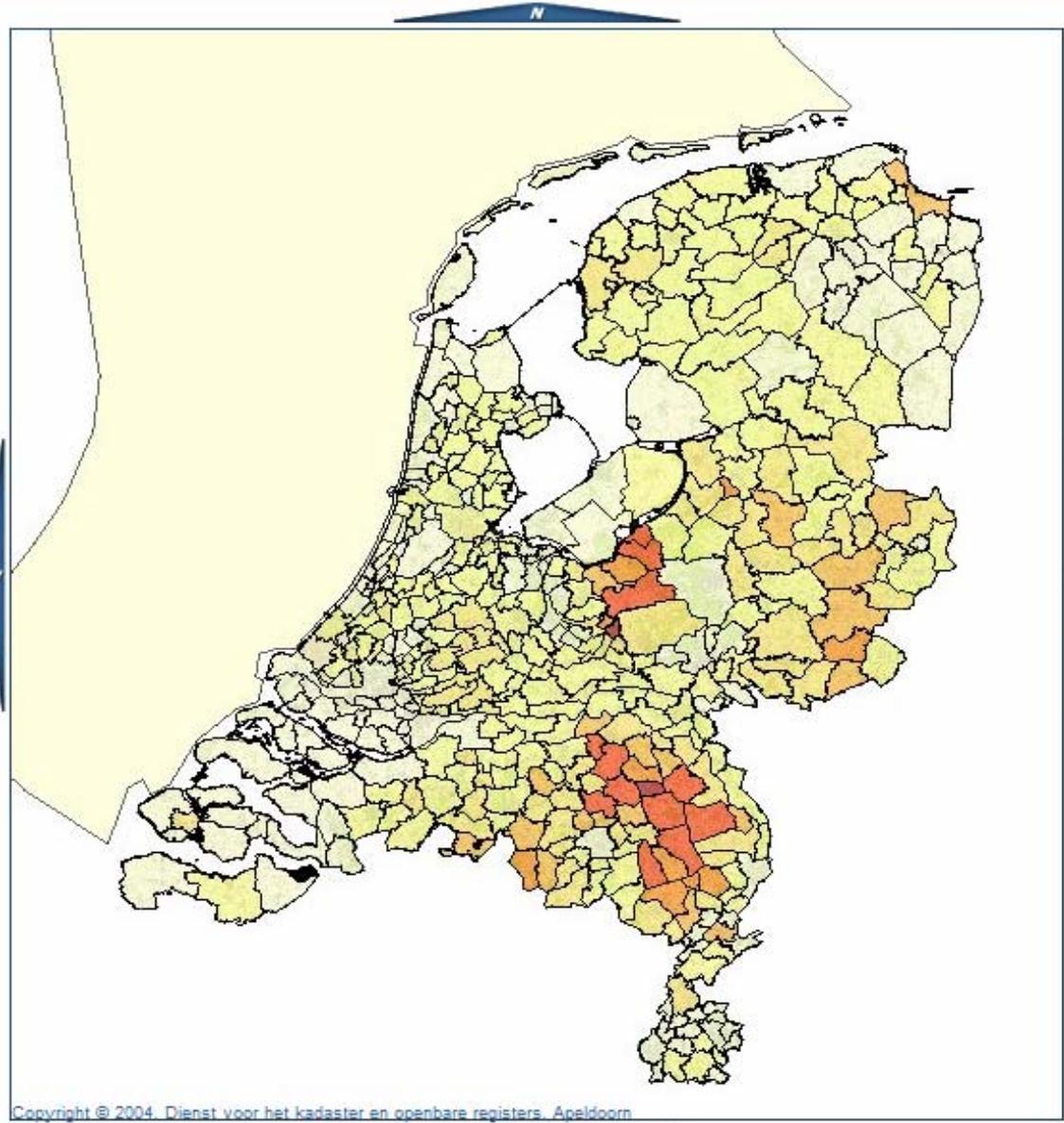
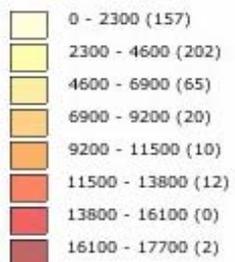
Refresh Map

Postalcode (4 positions)

Community

Search

Community (kg/km²)





selection presentation export settings

graph map

Community

2004

Oxides of nitrogen (as NO₂)

Air

Total

Topographic map as backgroundlay

Classification: equal interval

Emissions per km²

Facilities:

Refresh Map

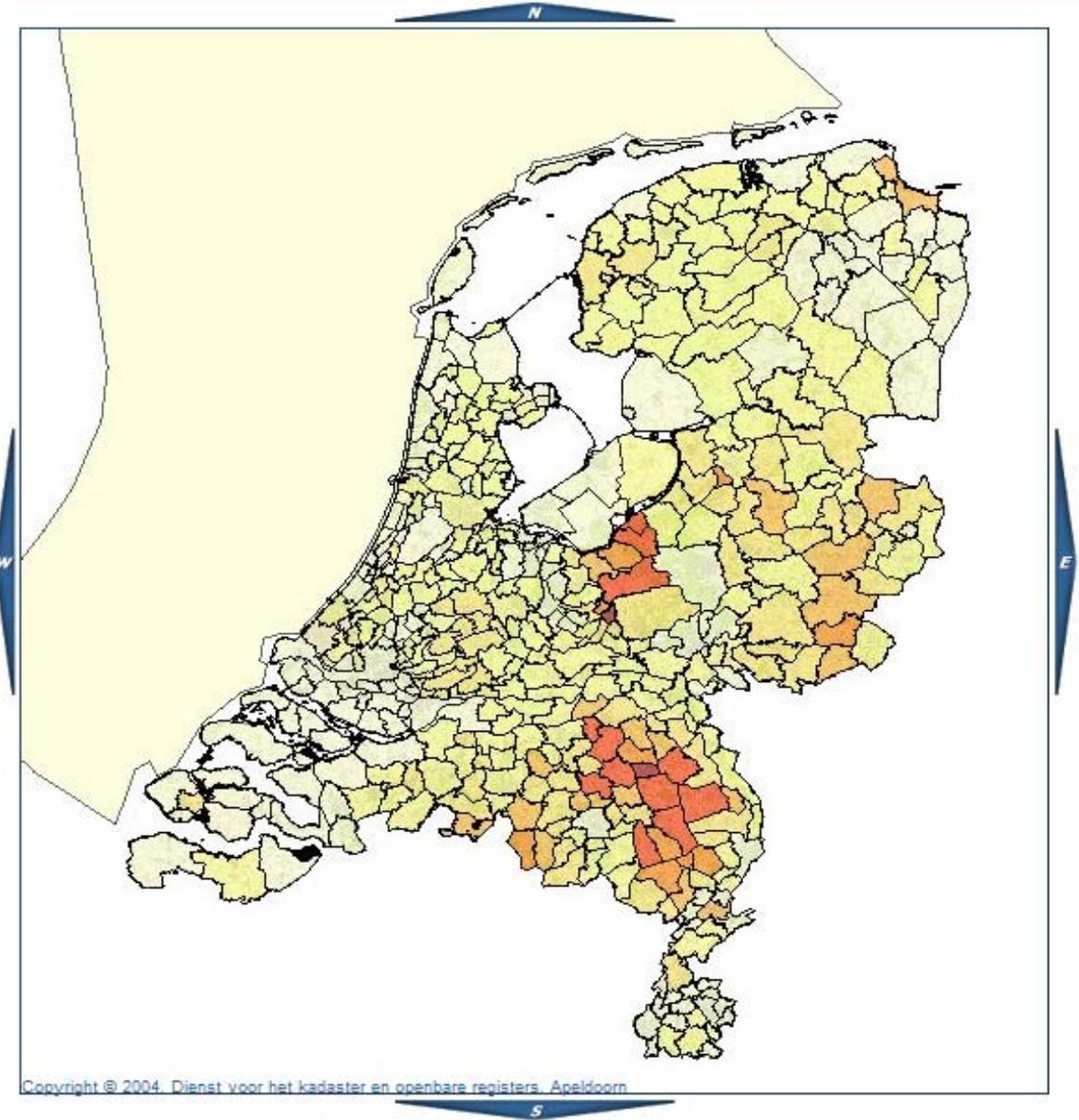
Postalcode (4 positions)

Community

Search

Community (kg/km²)

	0 - 2300 (157)
	2300 - 4600 (202)
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	6900 - 9200 (20)
	9200 - 11500 (10)
	11500 - 13800 (12)
	13800 - 16100 (0)
	16100 - 17700 (2)



Community

2004

Oxides ofnitrogen (as NO2)

Air

Total

Topographic map as backgroundlay

Classification: equal interval

Emissions per km2

Facilities:

Refresh Map

Postalcode (4 positions)

Community

Search

Community (kg/km2)

0 - 41000 (440)
41000 - 82000 (18)
82000 - 123000 (3)
123000 - 164000 (2)
164000 - 205000 (1)
205000 - 246000 (1)
246000 - 287000 (1)
287000 - 328000 (2)



selection presentation export settings

graph map

Community

2004

Oxides ofnitrogen (as NO2)

Air

Total

Topographic map as backgroundlay

Classification: equal interval

Emissions per km2

Facilities:

Refresh Map

Postalcode (4 positions)

Community

rotterdam

Search

Community (kg/km2)

	0 - 41000 (440)
	41000 - 82000 (18)
	82000 - 123000 (3)
	123000 - 164000 (2)
	164000 - 205000 (1)
	205000 - 246000 (1)
	246000 - 287000 (1)
	287000 - 328000 (2)





Community

2004

Oxides of nitrogen (as NO₂)

Air

Total

Topographic map as backgroundlay

Classification: equal interval

Emissions per km²

Facilities:

Refresh Map

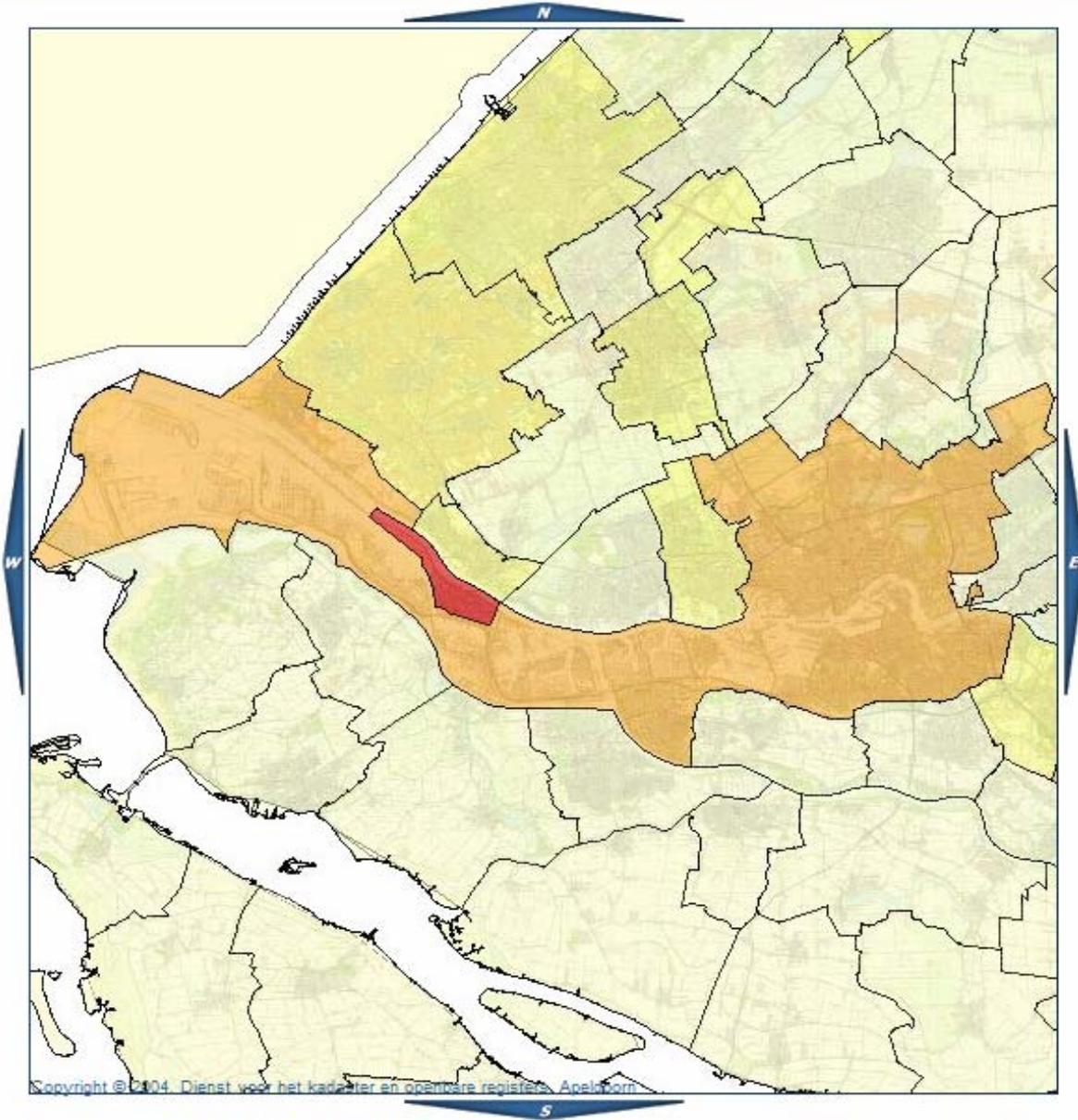
Postalcode (4 positions)

Community

rotterdam Search

Community (kg/km²)

	0 - 41000 (440)
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selection presentation export settings

graph map

Community

2004

Oxides of nitrogen (as NO₂)

Air

Total

Topographic map as backgroundlay

Classification: equal interval

Emissions per km²

Facilities:

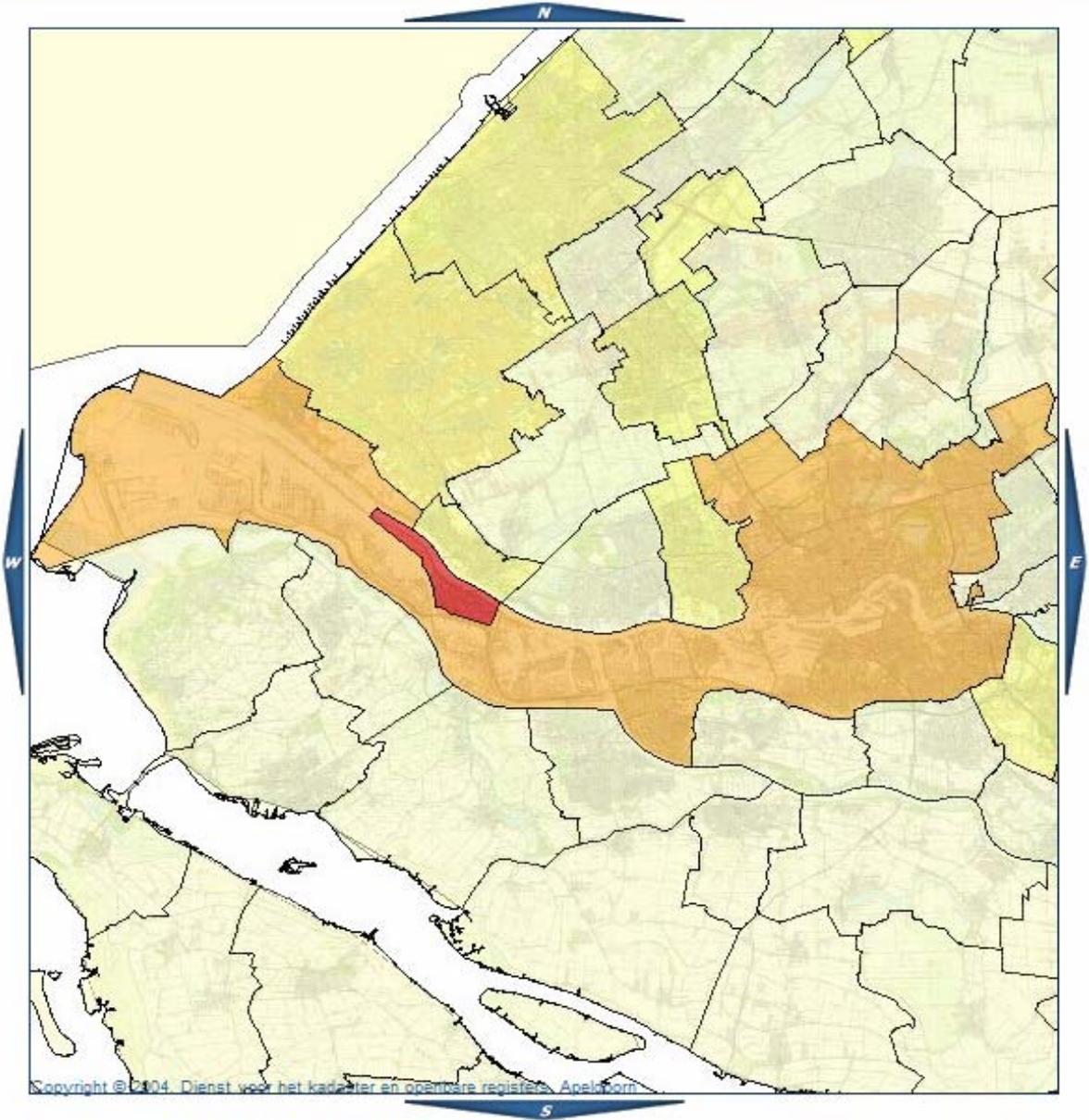
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Postalcode (4 positions)
 Community

rotterdam Search

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	0 - 41000 (440)
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Community

2004

Oxides of nitrogen (as NO₂)

Air

Total

Topographic map as backgroundlay

Classification: equal interval

Emissions per km²

Facilities:

[Refresh Map](#)

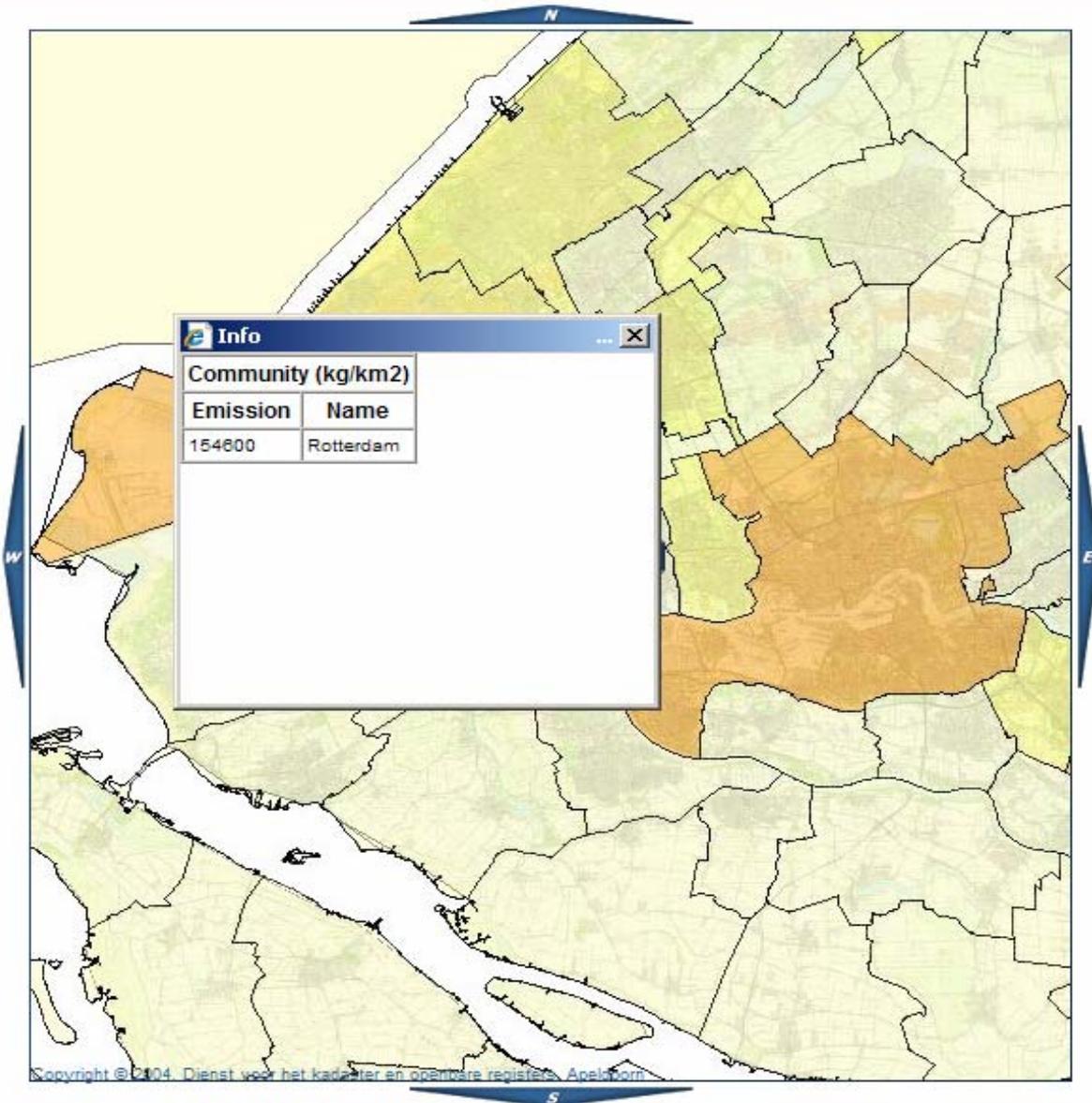
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Community

[Search](#)

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	205000 - 246000 (1)
	246000 - 287000 (1)
	287000 - 328000 (2)



Info

Community (kg/km²)

Emission	Name
154600	Rotterdam



[Nederlandse versie](#)

Introduction

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[General explanation](#)

[How to use emissions](#)

Preselected graphics

-- choose a graphic

Preselected maps

-- choose map

[the Netherlands](#)

[Postalcode](#)

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selection presentation export settings

general sector/activity

Compound

Compound category

All substances

Acrolein
Acrylonitril
Ammonia
Antimony comp. (as Sb)
Anthracene
Arsenic comp. (as As)
Barium comp. (as Ba)
Benz[a]anthracene
Benzene
Benzo[a]pyrene
Benzo[b]fluoranthene
Benzo[ghi]perylene
Benzo[k]fluoranthene
CFC,H(C)FC and Halons
Cadmium comp. (as Cd)
Carbon dioxide
Carbon monoxide
Chemical oxygen demand
Chlorides
Chlorobenzenes
Chloroparaffins (C1-C3)
Chlorophenols
Chromium comp. (as Cr)
Chrysene
Coarse dust
Copper comp. (as Cu)
Cyanides
Dibutyl phtalate
Dichloro ethane, 1,2-
Dichlorobenzene,1,4-

Year

1990
1995
2000
2003
2004
2005

Compartment

Air



selection presentation export settings

general sector/activity

Compound

Compound category

All substances

All substances

Environmental Balance

WFD List I (76/464) substances (Annex IXb)

WFD priority substances (Annex Xb)

WFD priority hazardous substances (Annex Xb)

WFD catchment-relevant substances

RAP (Rhine Action Programme/Rhine 2020)

OSPAR chemicals for priority action

Heavy metals

Greenhouse gases

Acidifying emissions

EU National Emission Ceilings

Eutrophying substances

UNECE-CLRTAP (EMEP)

Pesticide

Carbon dioxide

Carbon monoxide

Chemical oxygen demand

Chlorides

Chlorobenzenes

Chloroparaffins (C1-C3)

Chlorophenols

Chromium comp. (as Cr)

Chrysene

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Dichlorobenzene, 1,4-

Year

1990

1995

2000

2003

2004

2005

Compartment

Air



selection presentation export settings

general sector/activity

Compound

Compound category

Environmental Balance

- Ammonia
- Carbon dioxide
- Dinitrogen oxide
- Fine dust (PM10)
- Methane
- N - total**
- Non-methane VOS
- Oxides of sulphur (as SO2)
- Oxides of nitrogen (as NO2)
- P - total

Year

- 1990
- 1995
- 2000
- 2003
- 2004
- 2005

Compartment

Air



selection presentation export settings

general sector/activity

Compound

Compound category

Environmental Balance

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- Oxides of sulphur (as SO2)
- Oxides of nitrogen (as NO2)
- P - total

Year

- 1990
- 1995
- 2000
- 2003
- 2004
- 2005

Compartment

Air

- Air
- Air IPCC
- Load to surfacewater**
- Soil
- Water

selection presentation export settings

general sector/activity

Legend



Source Category

Select sublevel Deselect sublevel Deselect all categories (14)

- Total
 - Agriculture
 - Chemical industry
 - Construction
 - Consumers
 - Energy production
 - Nature
 - Other
 - Other industries
 - Refineries
 - Sewage and waste water treatment
 - Trade and services
 - Transport
 - Waste disposal



selection presentation export settings

graph map

Type of presentation

Absolute Relative

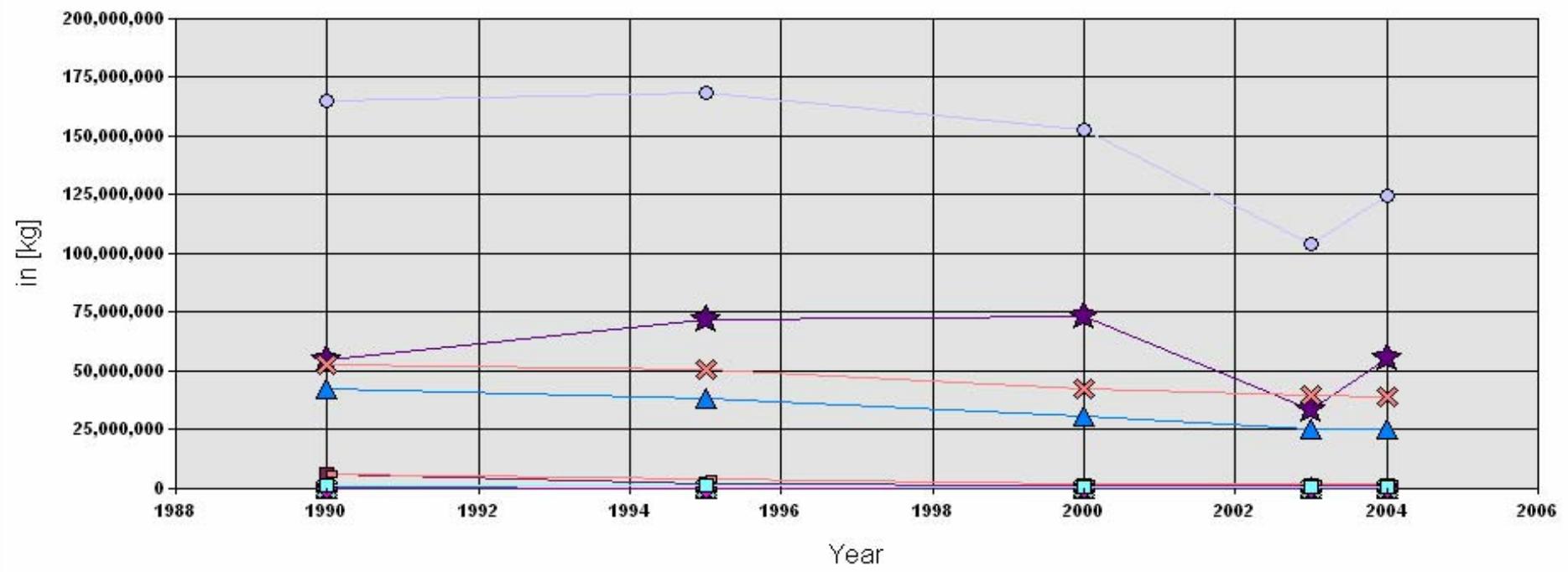
Year of reference

1990

Ok

Clear Graph

Absolute emissionseries

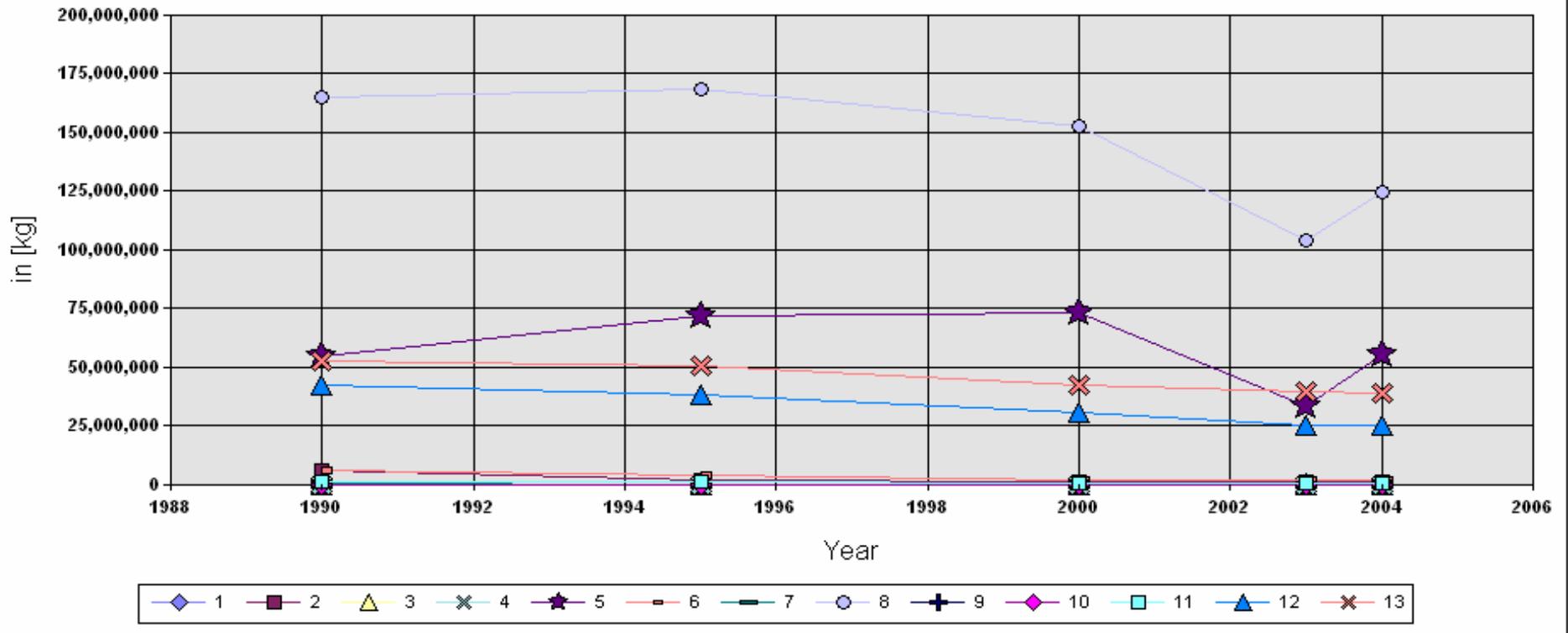


Legend: 1 (diamond), 2 (square), 3 (triangle), 4 (x), 5 (star), 6 (dash), 7 (dash), 8 (circle), 9 (+), 10 (diamond), 11 (square), 12 (triangle), 13 (x)

Remove To Excel

#	<input type="checkbox"/>	Sector/Activity	Theme	Pollutant	Unit	Sectortype	Sector	1990	1995	2000	2003	2004	Activity	Facility	Compartment
8	<input type="checkbox"/>	Total		N - total	kg			164800000	168700000	152400000	104100000	124700000			Load to surfacewater

Absolute emissionseries



#	<input type="checkbox"/>	Sector/Activity	Theme	Pollutant	Unit	Sectortype	Sector	1990	1995	2000	2003	2004	Activity	Facility	Compartment
8	<input type="checkbox"/>	Total		N - total	kg			164800000	168700000	152400000	104100000	124700000			Load to surfacewater
5	<input type="checkbox"/>	Agriculture		N - total	kg	Sector	Agriculture	54630000	71600000	73130000	33560000	55300000			Load to surfacewater
13	<input type="checkbox"/>	Other		N - total	kg	Sector	Other	52850000	50440000	42600000	40020000	39080000			Load to surfacewater
12	<input type="checkbox"/>	Sewage and waste water treatment		N - total	kg	Sector	Sewage and waste water treatment	42640000	38640000	30820000	25450000	25190000			Load to surfacewater
6	<input type="checkbox"/>	Chemical industry		N - total	kg	Sector	Chemical industry	5915000	3856000	2078000	1737000	1933000			Load to surfacewater
2	<input type="checkbox"/>	Other industries		N - total	kg	Sector	Other industries	6032000	2035000	1637000	1169000	1275000			Load to surfacewater



selection presentation export settings

general sector/activity

Legend



Source Category

Select sublevel Deselect sublevel Deselect all categories (14)

- Total
 - Agriculture
 - Chemical industry
 - Construction
 - Consumers
 - Energy production
 - Nature
 - Other
 - Other industries
 - Refineries
 - Sewage and waste water treatment
 - Trade and services
 - Transport
 - Waste disposal



selection | presentation | export | settings

general | sector/activity

Legend



Source Category

Select sublevel | Deselect sublevel | Deselect all categories (1)

- Total
 - Agriculture
 - Chemical industry
 - Construction
 - Consumers
 - Energy production
 - Nature
 - Other
 - Other industries
 - Refineries
 - Sewage and waste water treatment
 - Trade and services
 - Transport
 - Waste disposal

Legend



Source Category

Select sublevel Deselect sublevel Deselect all categories (1)

- Total
- Agriculture
 - cattle breeding pigs
 - cattle breeding cattle
 - cattle breeding poultry
 - cattle breeding other
 - manure (NH3)
 - artificial fertilizer
 - market gardening (outdoor field)
 - cultivation under glass
 - cultivation of corn
 - meadows and pasture-land
 - other productions agriculture/marketgardening
 - arable farming
 - run off and leaching
 - lateral manure of ditches
 - preserved wood applied in agriculture
 - angling, use of sinker and lead shot
 - hunting, lead shot and zinc emissions
 - pesticides in agriculture
 - agriculture other
 - corrosion galvanized steel cultivation underglass
 - temperature correction agriculture
 - balance entries agricultural soil

Legend



Source Category

Select sublevel Deselect sublevel Deselect all categories (26)

- Total
 - Agriculture
 - cattle breeding pigs
 - cattle breeding cattle
 - cattle breeding poultry
 - cattle breeding other
 - manure (NH3)
 - artificial fertilizer
 - market gardening (outdoor field)
 - cultivation under glass
 - cultivation of corn
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 - run off and leaching
 - lateral manure of ditches
 - preserved wood applied in agriculture
 - angling, use of sinker and lead shot
 - hunting, lead shot and zinc emissions
 - pesticides in agriculture
 - agriculture other
 - corrosion galvanized steel cultivation underglass
 - temperature correction agriculture
 - balance entries agricultural soil
 - farmland emission - supply minus discharge
 - supply + deposition on farmland
 - manure and artificial fertilizer (NH3)
 - Chemical industrv



selection presentation export settings

graph map

Type of presentation

Absolute Relative

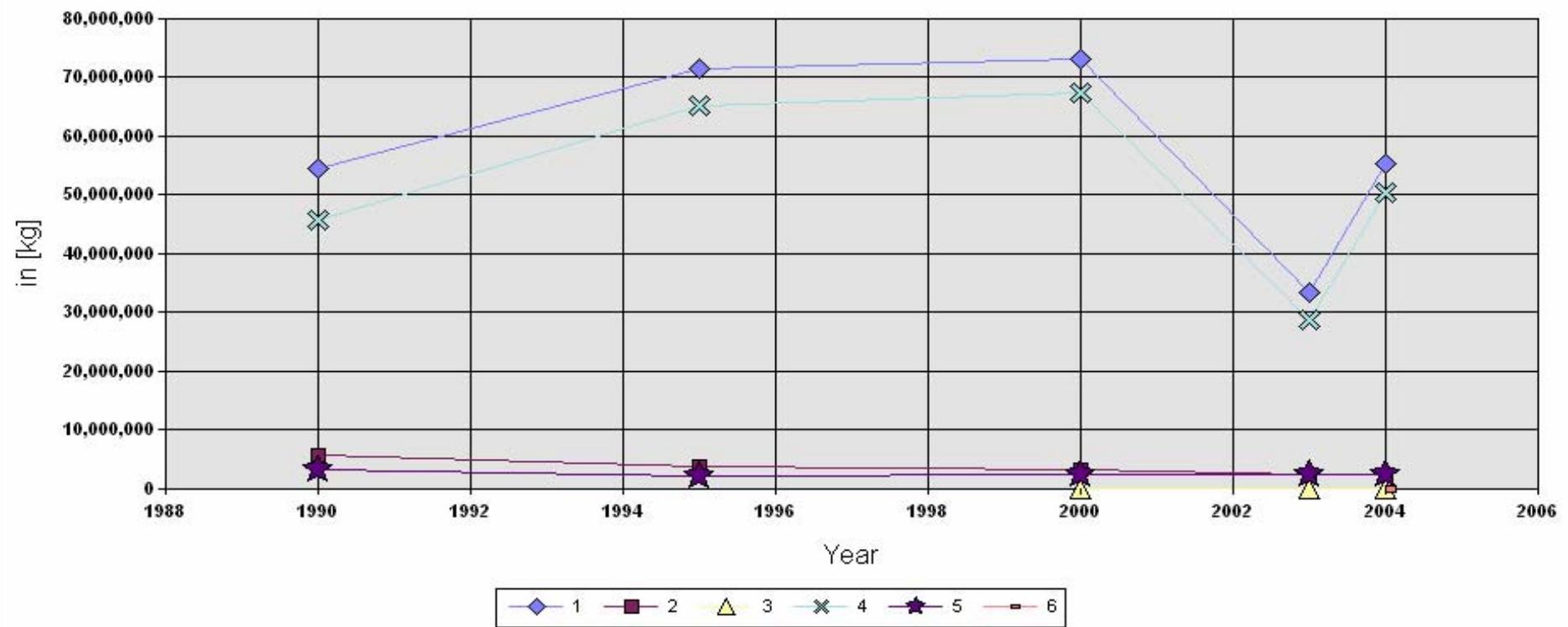
Year of reference

1990

Ok

Clear Graph

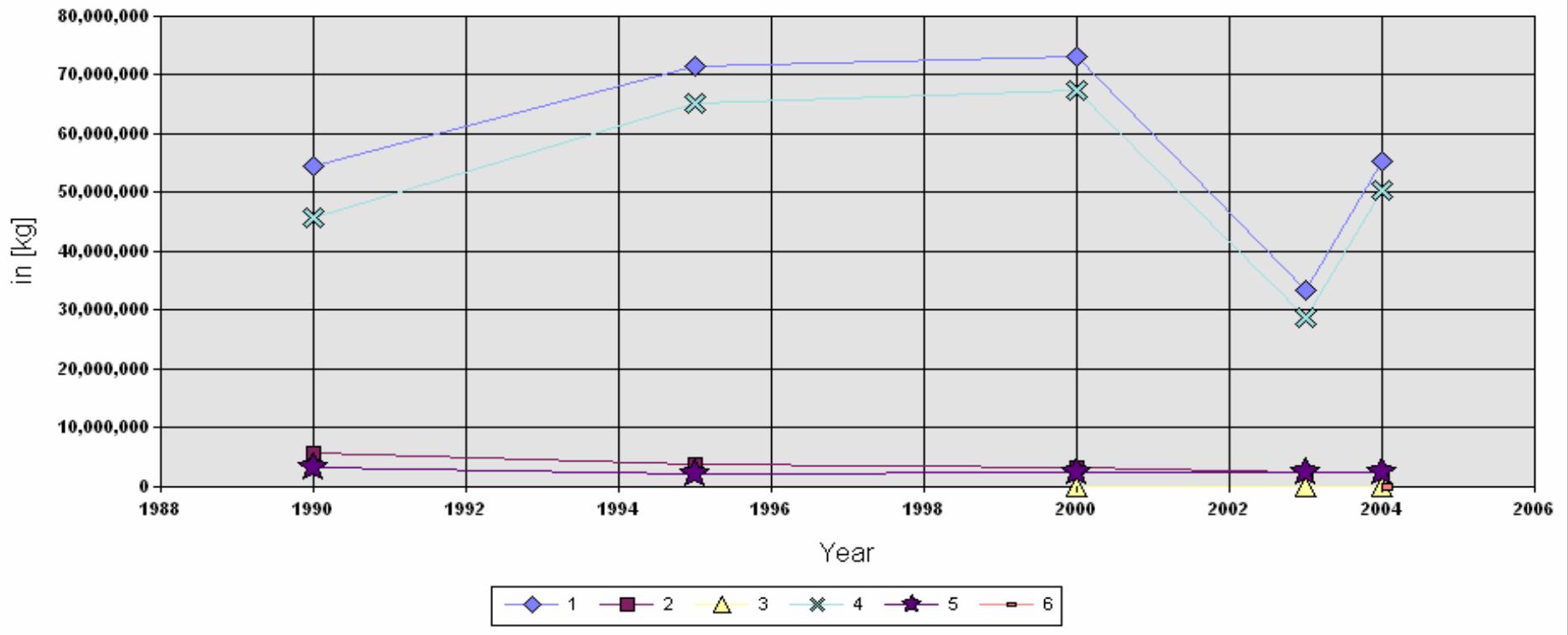
Absolute emissionseries



Remove To Excel

#	<input type="checkbox"/>	Sector/Activity	Theme	Pollutant	Unit	Sectortype	Sector	1990	1995	2000	2003	2004	Activity	Facility	Compartment
1	<input type="checkbox"/>	Agriculture		N - total	kg	Sector	Agriculture	54630000	71600000	73130000	33560000	55300000			Load to surfacewater
4	<input type="checkbox"/>	run off and		N - total	kg	Subsector	run off and	45740000	65320000	67520000	28810000	50380000			Load to

Absolute emissionseries



Remove To Excel

#	<input type="checkbox"/>	Sector/Activity	Theme	Pollutant	Unit	Sectortype	Sector	1990	1995	2000	2003	2004	Activity	Facility	Compartment
1	<input type="checkbox"/>	Agriculture		N - total	kg	Sector	Agriculture	54630000	71600000	73130000	33560000	55300000			Load to surfacewater
4	<input type="checkbox"/>	run off and leaching		N - total	kg	Subsector	run off and leaching	45740000	65320000	67520000	28810000	50380000			Load to surfacewater
2	<input type="checkbox"/>	lateral manure of ditches		N - total	kg	Subsector	lateral manure of ditches	5630000	3960000	3270000	2350000	2510000			Load to surfacewater
5	<input type="checkbox"/>	cultivation under glass		N - total	kg	Subsector	cultivation under glass	3260000	2320000	2330000	2400000	2410000			Load to surfacewater
3	<input type="checkbox"/>	agriculture other		N - total	kg	Subsector	agriculture other			1511	1403	142			Load to surfacewater
6	<input type="checkbox"/>	pesticides in		N - total	kg	Subsector	pesticides					0			Load to



[selection](#) | [presentation](#) | [export](#) | [settings](#)

[by sector/activity](#) | [by location](#)

Selection

Pollutant: N - total

Year: 1990,1995,2000,2003,2004

Compartment: Load to surfacewater

Sector/Activity

[Export](#)



[selection](#) | [presentation](#) | [export](#) | [settings](#)

[by sector/activity](#) | [by location](#)

Selection

Pollutant: N - total
Year: 1990,1995,2000,2003,2004
Compartment: Load to surfacewater

Sector/Activity

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File Download

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selection presentation export settings

by sector/activity by location

Selection

Pollutant: N - total

Year: 1990,1995,2000,2003,2004

Compartment: Load to surfacewater

Sector/Activity

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by sector/activity | **by location**

Selection
Pollutant: N - total
Year: 1990,1995,2000,2003,2004
Compartment: Load to surfacewater

Sector/Activity
Download

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	A	B	C	D
1	Sector	Subsector	act. code	activity
2	Agriculture	cultivation under glass	45040102	Discharges N and P from greenhouses
3	Agriculture	run off and leaching	40330202	Run-off N and P from agricultural and natural soils
4	Agriculture	run off and leaching	40340202	Leaching N and P from agricultural and natural soils
5	Agriculture	lateral manure of ditches	45010102	Accidental nitrification of ditches and drains
6	Agriculture	pesticides in agriculture	40380202	
7	Agriculture	agriculture other	T10570202	Facilities NACE 01: Agriculture, hunting and service providers
8	Sewage and waste water treatment	run overs	E90101102	Stormwater overflows
9	Sewage and waste water treatment	rainwater drains	E90111102	Rainwater sewers
10	Sewage and waste water treatment	untreated sewered households	E90131102	Untreated sewers
11	Sewage and waste water treatment	wastewater treatment plant - procesemissions	E40011102	Discharges from wastewater treatment plants (measured)
12	Sewage and waste water treatment	wastewater treatment plant - procesemissions	T11130202	Facilities NACE 90010: Waste water treatment plants
13	Trade and services	other tsg	T10620202	Facilities NACE 41: Water collection, treatment and supply
14	Trade and services	other tsg	T10640202	Facilities NACE 50: Sale, maintenance and repair of motor vehicles and motorcycles
15	Trade and services	other tsg	T10660202	Facilities NACE 60: Transportation by land
16	Trade and services	other tsg	T10690202	Facilities NACE 70/74: Renting and consultancy activities
17	Trade and services	other tsg	T10710202	Facilities NACE 75.2: Foreign affairs and defense activities
18	Trade and services	other tsg	T10720202	Facilities NACE 80/85: Education and Healthcare
19	Trade and services	other tsg	T10760202	Facilities NACE 92/93: Culture, sports, leisure and other community services
20	Trade and services	other tsg	T10880202	Facilities NACE 63: Supporting transport activities
21	Trade and services	other tsg	T15110202	Facilities NACE 51/52: Retail and Wholesale trade
22	Other	deposition on surface water	E90141102	Deposition on sewers
23	Other	deposition on surface water	E90151202	Deposition from run-off hardened surfaces
24	Other	deposition on northsea	E90151102	Deposition on saline waters
25	Other industries	basic metal (sbi:27)	T10460202	Facilities NACE 27 (excluding 27.4 and 27.5): Manufacture of basic iron and steel
26	Other industries	basic metal (sbi:27)	T10470202	Facilities NACE 27.4: Manufacture of non-ferrous metals
27	Other industries	basic metal (sbi:27)	T10490202	Facilities NACE 27.5: Manufacture of ferrous metals
28	Other industries	metal-electro (sbi:28 - 35)	T10840202	Facilities NACE 35.1: Building and repairing of boats
29	Other industries	metal-electro (sbi:28 - 35)	T10860202	Facilities NACE 35 (excl 35.1 and 35.4): Manufacture of transportation, not being motc
30	Other industries	metal-electro (sbi:28 - 35)	T10500202	Facilities NACE 28, excluding 28.51: Manufacture of metal structures and parts of stru
31	Other industries	metal-electro (sbi:28 - 35)	T10510202	Facilities NACE 28.51: Treatment and coating of metals
32	Other industries	metal-electro (sbi:28 - 35)	T10520202	Facilities NACE 29, 31 and 32: Manufacture of various machinery, tools, electronic pro
33	Other industries	metal-electro (sbi:28 - 35)	T10530202	Facilities NACE 34: Manufacture of motor vehicels, trailers and semi-trailers
34	Other industries	textile and carpet industries (sbi:17,18)	T10150202	Facilities NACE 17.3: Finishing of textiles

Challenges in presenting geographic emission data

- Different users want different views
- Cartographic correctness
- Getting the message across
- Limitations to GIS on a website

Community

2004

Nitrogen oxide (as NO₂)

Air

Total

no background

Classification: equal interval

Emissions per km²

Facilities:

Refresh Map

Postalcode (4 positions)

Community

Search

Community (kg/km²)

	0 - 41000 (440)
	41000 - 82000 (18)
	82000 - 123000 (3)
	123000 - 164000 (2)
	164000 - 205000 (1)
	205000 - 246000 (1)
	246000 - 287000 (1)
	287000 - 328000 (2)



selection presentation export settings

graph map

Community

2004

Nitrogen oxide (as NO2)

Air

Total

no background

Classification: equal interval

Emissions per km2

Facilities:

Refresh Map

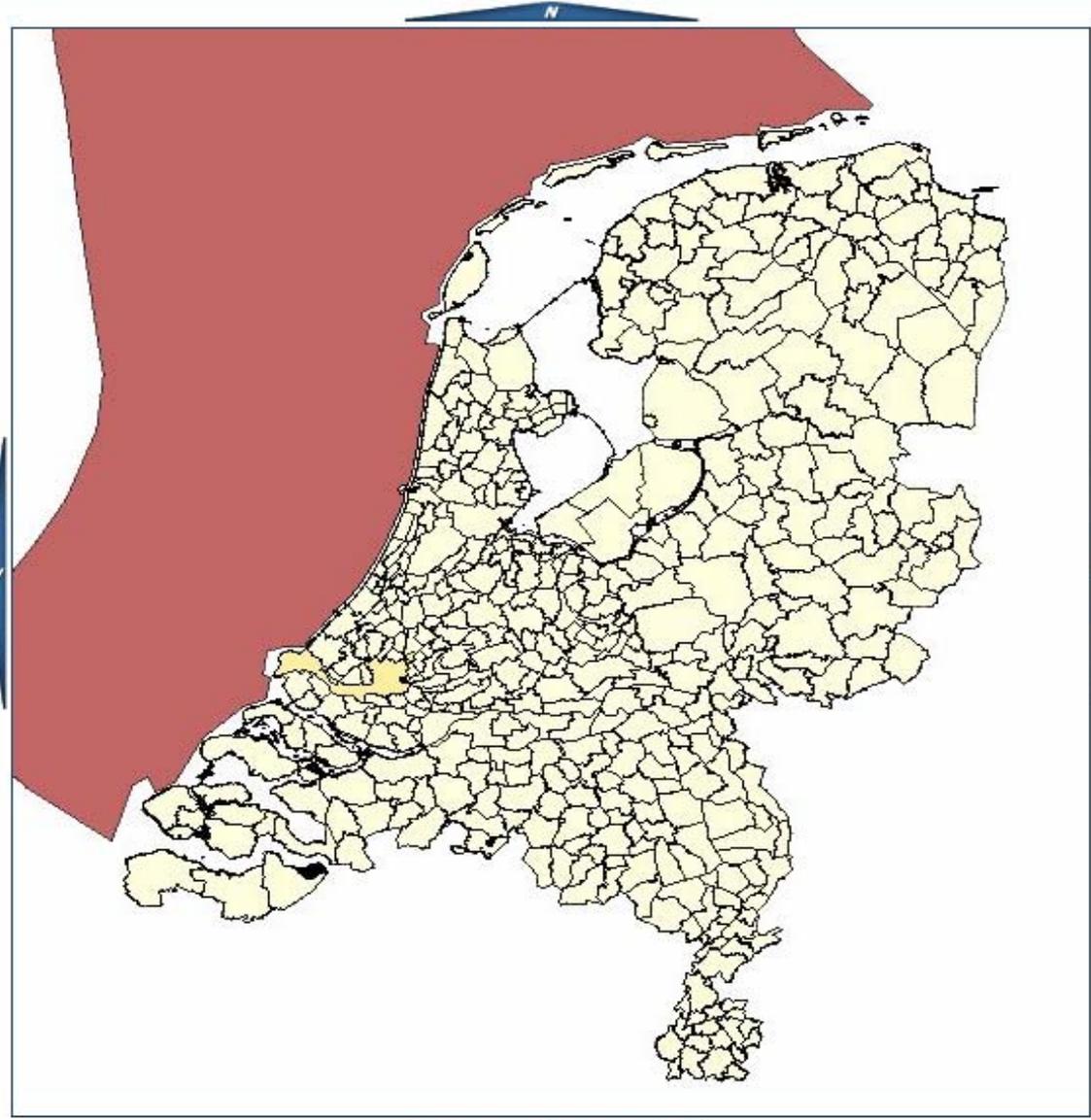
Postalcode (4 positions)

Community

Search

Community (kg)

	0 - 15000000 (468)
	15000000 - 30000000 (0)
	30000000 - 45000000 (1)
	45000000 - 60000000 (0)
	60000000 - 75000000 (0)
	75000000 - 90000000 (0)
	90000000 - 105000000 (0)
	105000000 - 120000000 (1)



selection presentation export settings

graph map

Community

2004

Nitrogen oxide (as NO₂)

Air

Total

no background

Classification: equal count

Emissions per km²

Facilities:

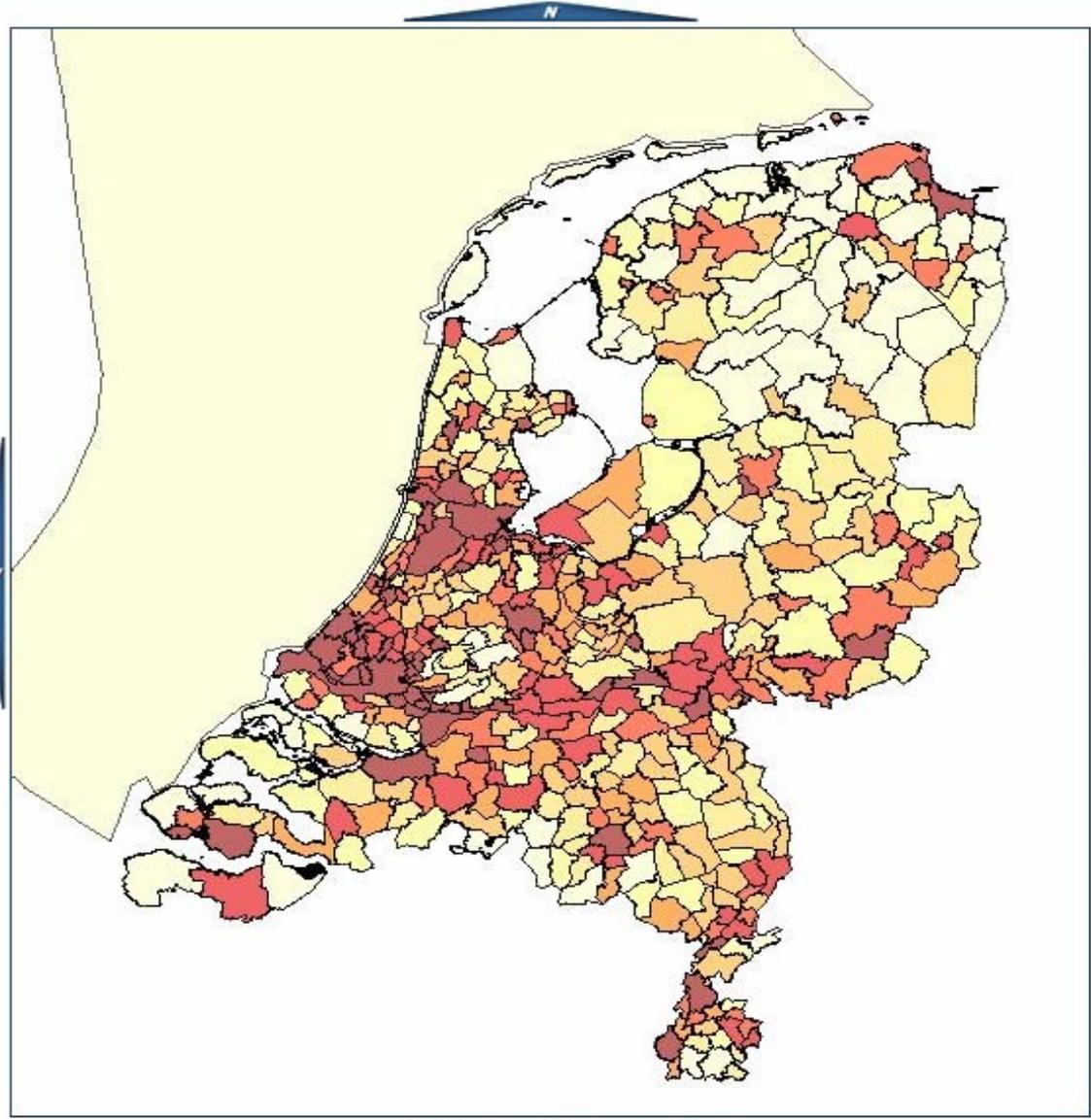
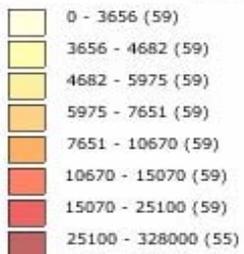
Refresh Map

Postalcode (4 positions)

Community

Search

Community (kg/km²)





selection presentation export settings

graph map

Community

2004

Nitrogen oxide (as NO₂)

Air

Total

no background

Classification: logarithmic

Emissions per km²

Facilities:

Refresh Map

Postalcode (4 positions)

Community

Search

Community (kg/km²)

	100 - 1000 (4)
	1000 - 10000 (284)
	10000 - 100000 (173)
	100000 - 1000000 (7)
	1000000 - 10000000 (0)
	10000000 - 100000000 (0)
	100000000 - 1000000000 (0)
	1000000000 - 10000000000 (0)



Conclusion

- Automation of our dataflow has significantly improved our data collection process
- Different user types have different needs, in creating multiple views on the same data we meet specific needs.
- Point source information can now be presented to the public

<http://www.emissieregistratie.nl>

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