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Monitoring data for the post- registration of pesticides: The Dutch atlas of pesticide concentrations in surface water

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www.leidenuniv.nl/cml www.pesticidesatlas.net



1 Introduction: pesticide measurements in surface water

- Many regional measurements by water authorities, however, at national level an overview lacking of:
 - Which pesticide is where and when a problem?
 - Can we use these data for pesticide re-approval?



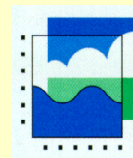
Aim of the study

- Where is a pesticide measured, found and exceeding a standard?
- Can we improve the monitoring systems? (there is no systematic post-monitoring system)
- Is it possible to link pesticide concentrations at the level of individual a.i. with land use (crop) data? (re-approval)



Set up study

- Time – spatial analysis of existing data
- Data analysis of 1999-2000
- 160 a.i., 700 locations, ± 150.000 measurements: wide variation between a.i.
- Standards:
 - Drinking Water Standard (0.1 and 0.5 $\mu\text{g/l}$)
 - Max. Tolerable Risk (MTR)
 - Value used for the approval of the pesticide



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Pesticide atlas 2004

- Internet application, free available
 - for policy makers, regulators, farmers, chemical industry, food industry & NGO's
- About 1000 maps of about 160 pesticides
- Examples of linking pesticide concentrations and land use with statistics

Bestrijdingsmiddelenatlas - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address http://www.bestrijdingsmiddelenatlas.nl Go Links

ROYAL HASKONING

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Welkom op de website bestrijdingsmiddelenatlas

ctb

VEWIN

VRM

Ministerie van Verkeer en Waterstaat
Directoraat-Generaal Rijkswaterstaat

TOELICHTING

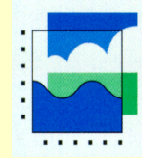
De waterbeheerders in Nederland verrichten veel metingen aan het voorkomen van bestrijdingsmiddelen in oppervlaktewater. Op initiatief van het Centrum voor Milieuwetenschappen Leiden en krachtig ondersteund door een groot aantal organisaties zijn deze metingen vertaald in een ruimtelijk beeld. ([Externe links](#)). Zo beoogt de website meer inzicht te geven in de aanwezigheid van bestrijdingsmiddelen in oppervlakte water drie normen. In de website zijn o.a. kaarten (met 5 bij 5 en 1 bij 1 kmhokken) en histogrammen opgenomen over de gemeten concentraties van individuele stoffen in relatie tot een drietal normen (drinkwaternorm, ecotoxicologische norm (MTR), toelatingsnorm). Daarnaast zijn er ook overzichten in de vorm van histogrammen en grafieken die gaan over de totale situatie in Nederland.

Deze atlas bevat alleen werkzame stoffen (en een aantal metabolieten) van de toegepaste bestrijdingsmiddelen (voor de periode 1999-2000 zo 'n 160 stoffen). In de [factsheet](#) vind u gegevens over de individuele stoffen welke zijn opgenomen in de atlas. Deze informatie omvat o.a. de toetsingsnormen, CAS-nummer en bestrijdingsmiddelengroep(en) waar de stof invalt.

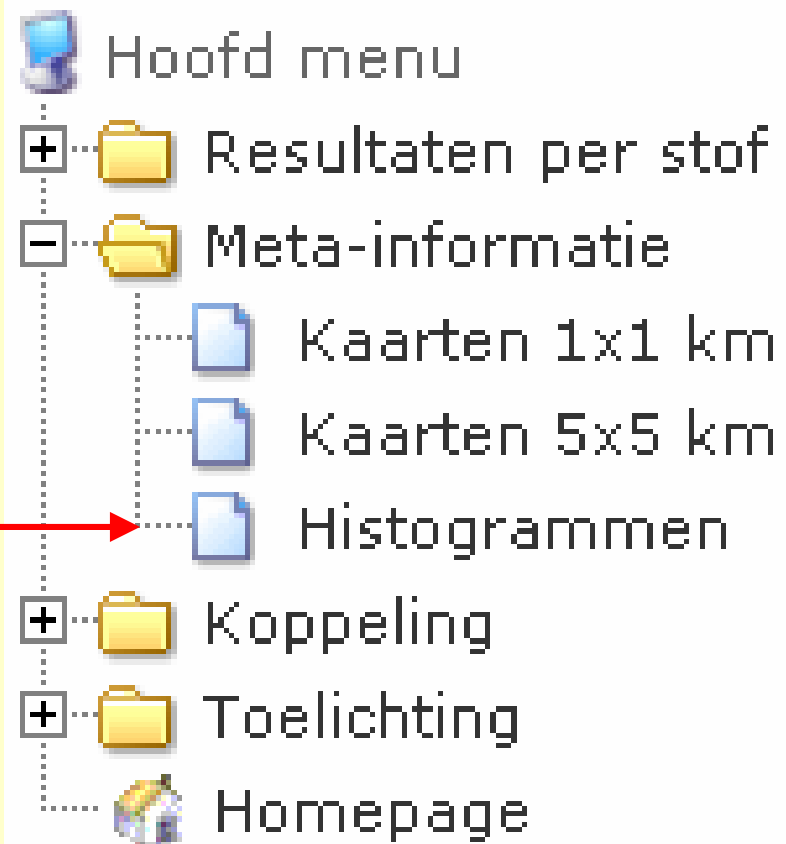
Internet

Start Bestrijdingsmiddelen... Stoffen samen - Microsof... RIVM-lezing-2004 nefyto-lezing-2004-klein SETAC-atlas-1 EN << 15:36

2 The pesticide atlas: meta data over time

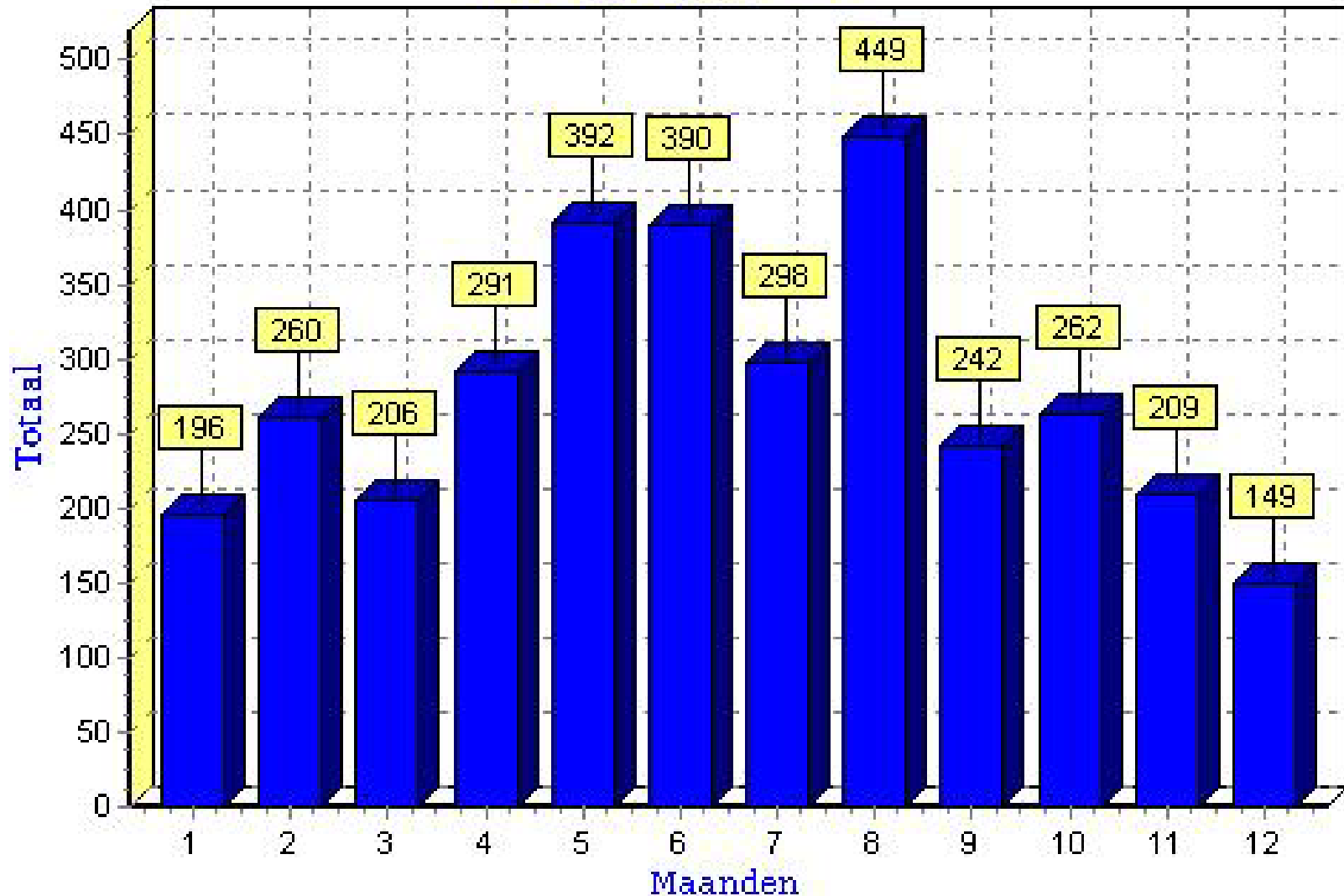


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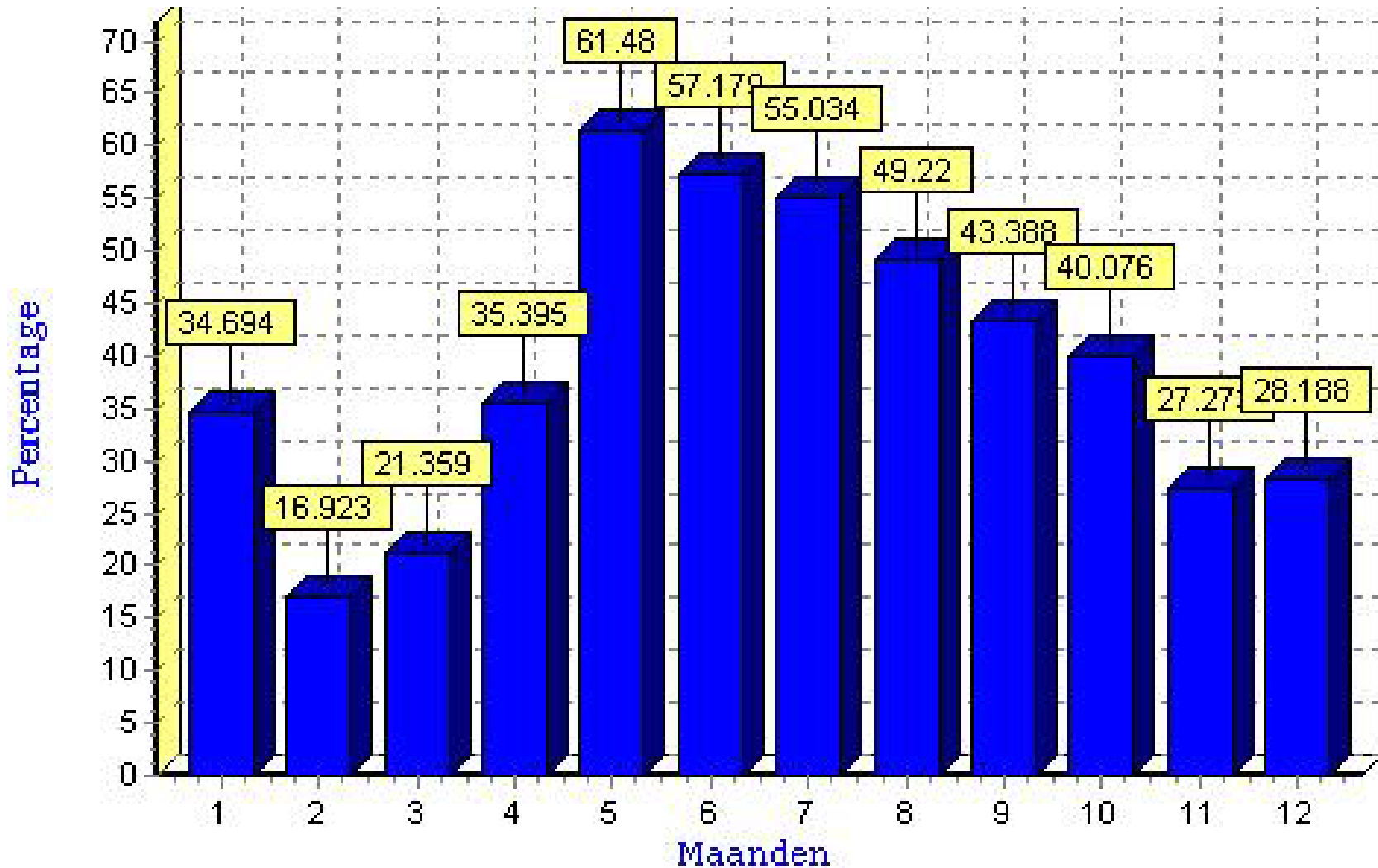


No. of locations with pesticide measurements during the year

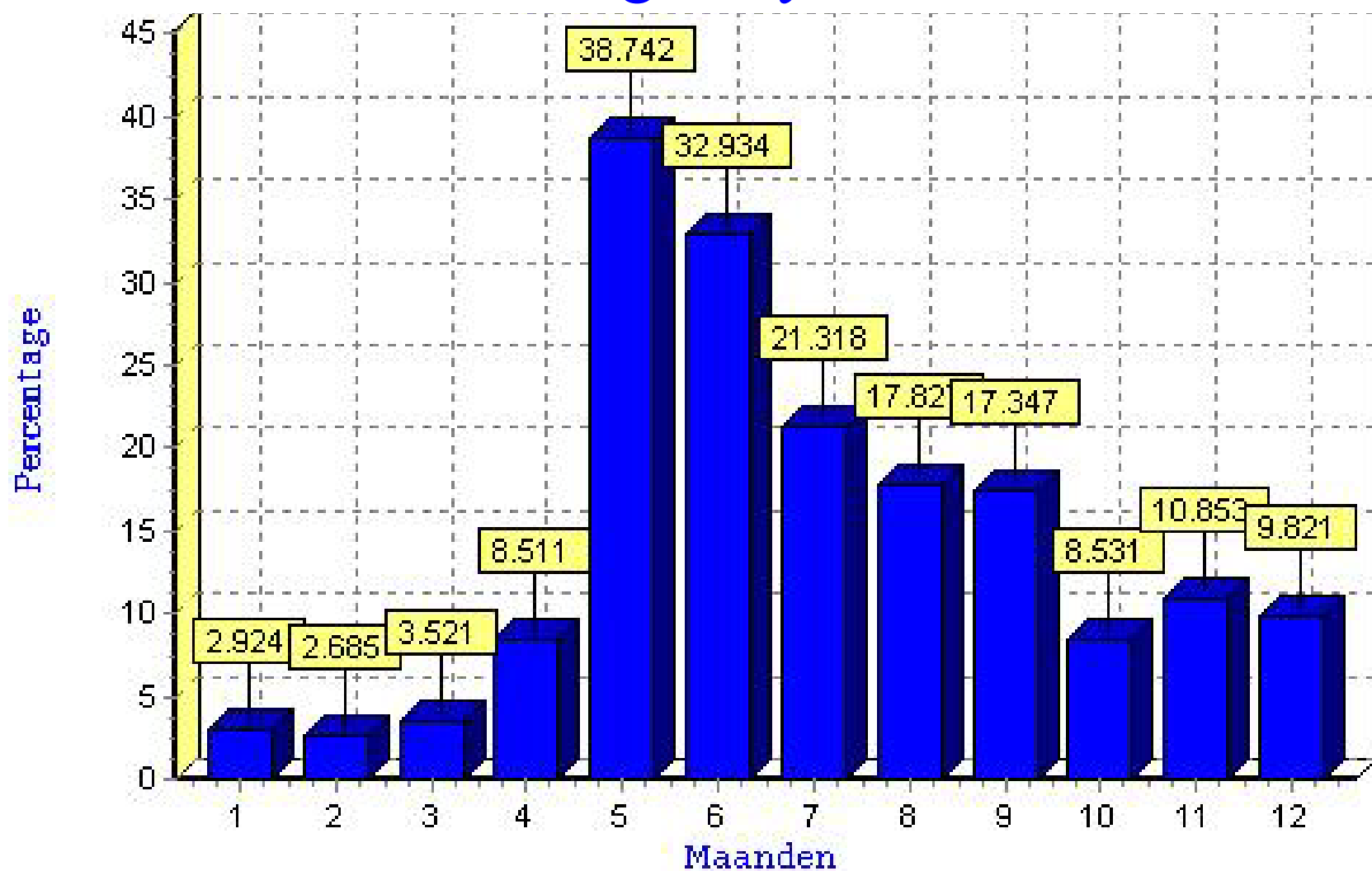
Metingen 1999-2000



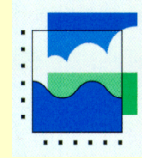
% locations exceeding EU drinking water during the year



% locations exceeding authorisation standard during the year



3 The pesticide atlas: geographical meta data



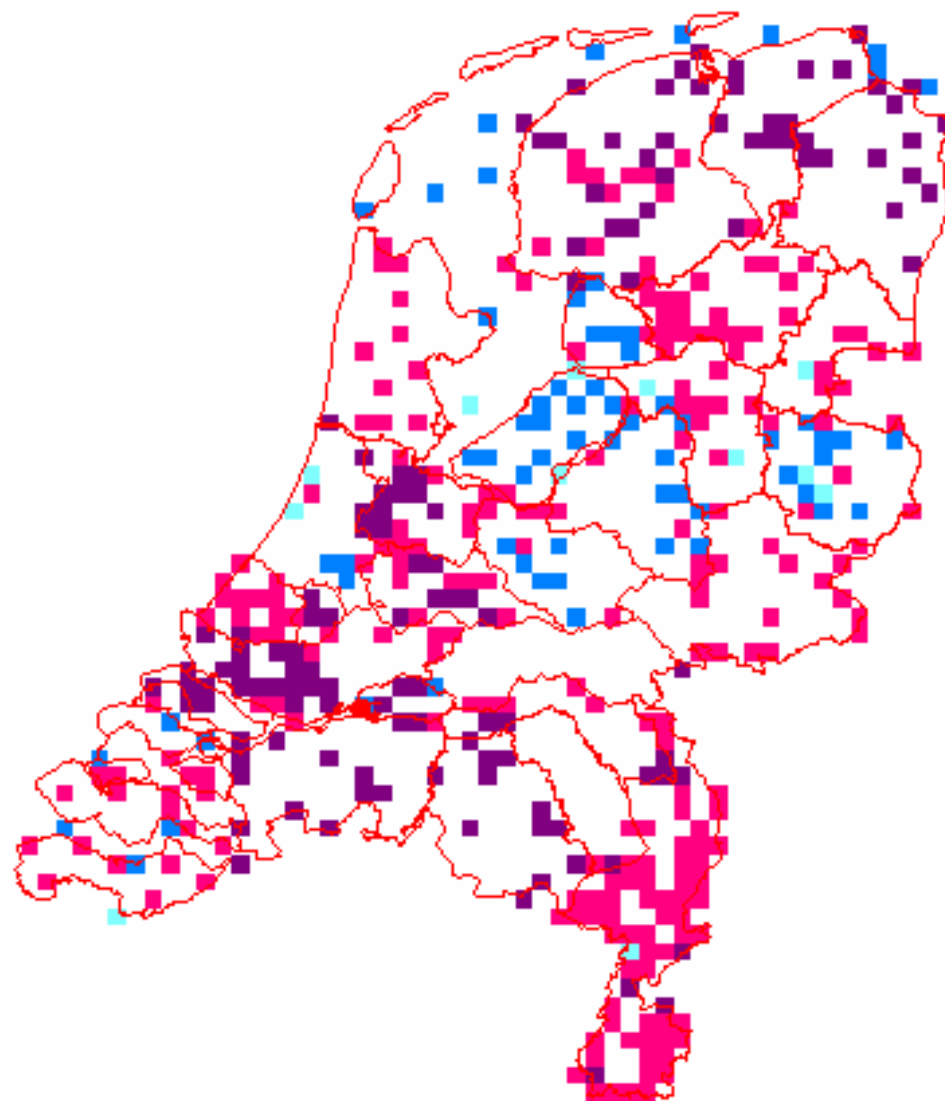
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- Hoofd menu
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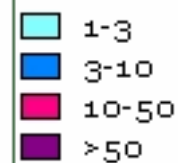
No. of pesticides measured / 5x5 km



[kaartlagen](#)

[Download data](#)

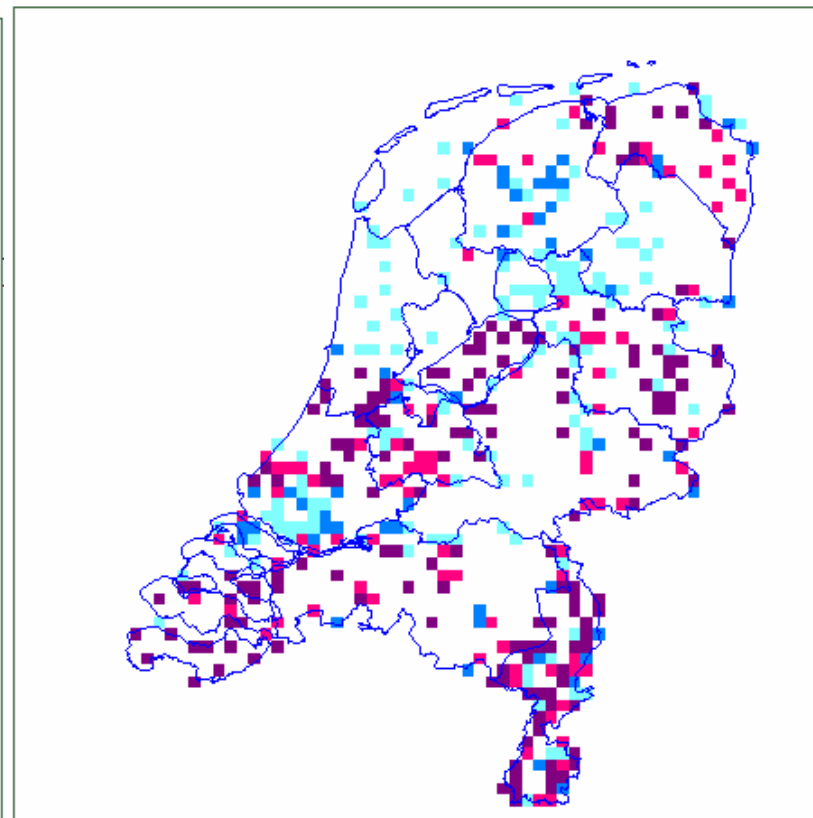
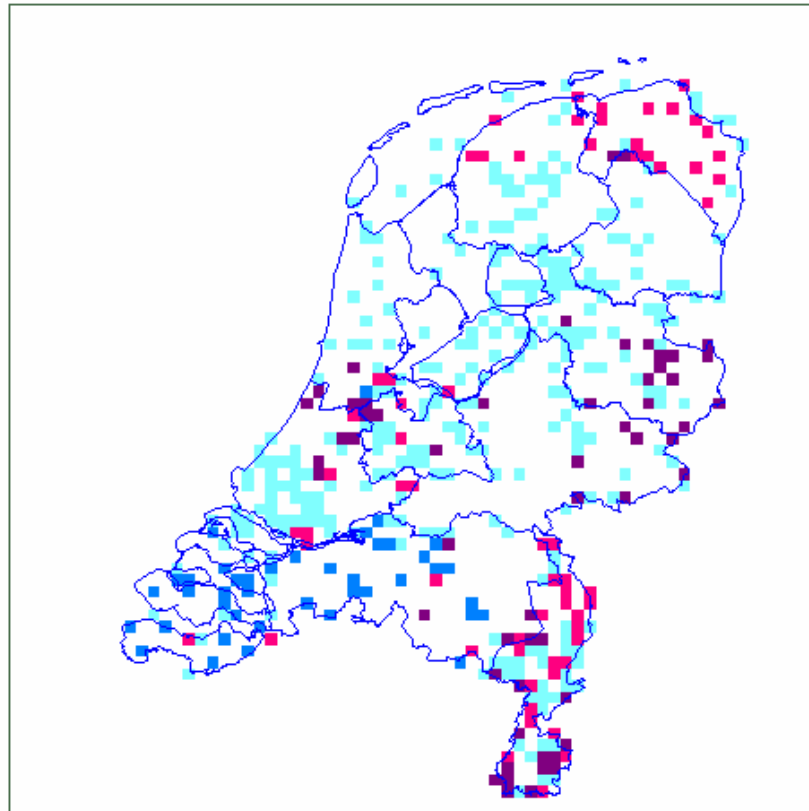
Aantal gevulde cellen 437



% of measured a.i. above authorisation standard and EU drinking water standard

Percentage onderzochte stoffen boven Toelatingsnorm

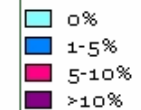
Percentage onderzochte stoffen boven drinkwaternorm



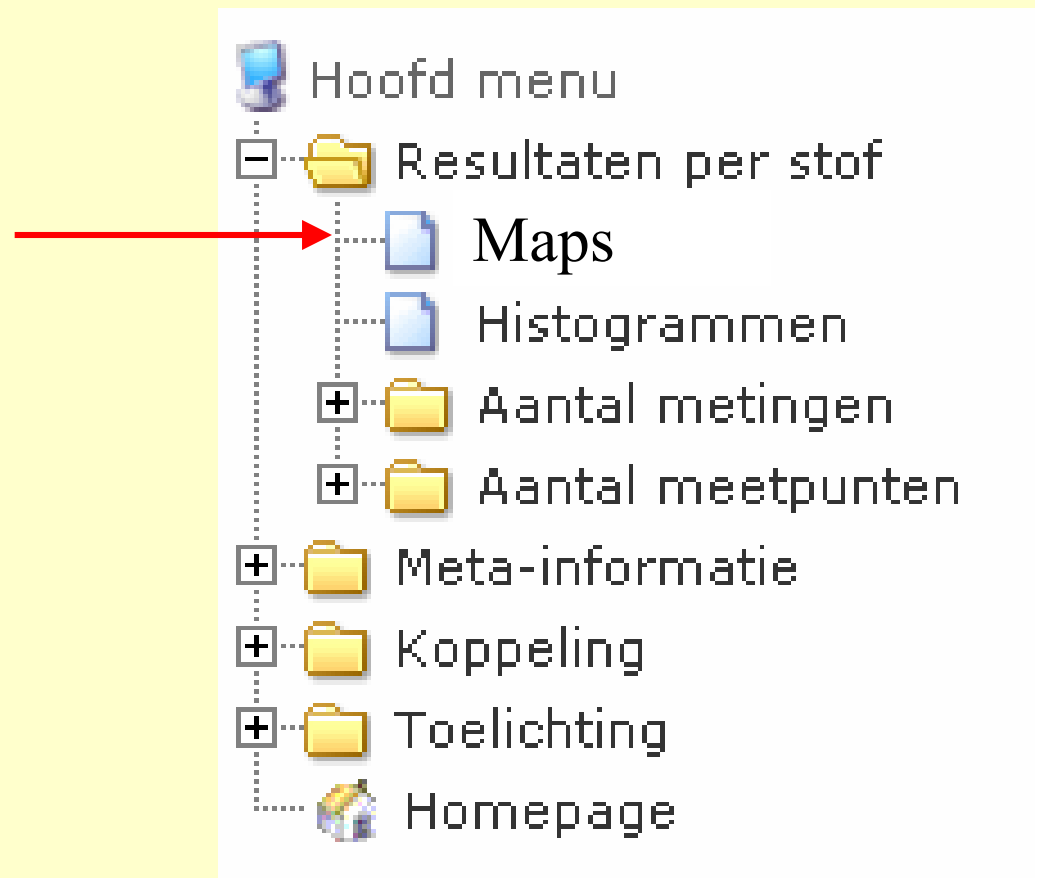
[kaartlagen](#)

[Download data](#)

Aantal gevulde cellen 437



4 The pesticide atlas: geographical data *per substance*



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Periode:

Stof:

Norm.: [toelichting...](#)

Resolutie:

Periode:

Stof:

Norm:


Resolutie:

Periode:

Stof:

Norm:

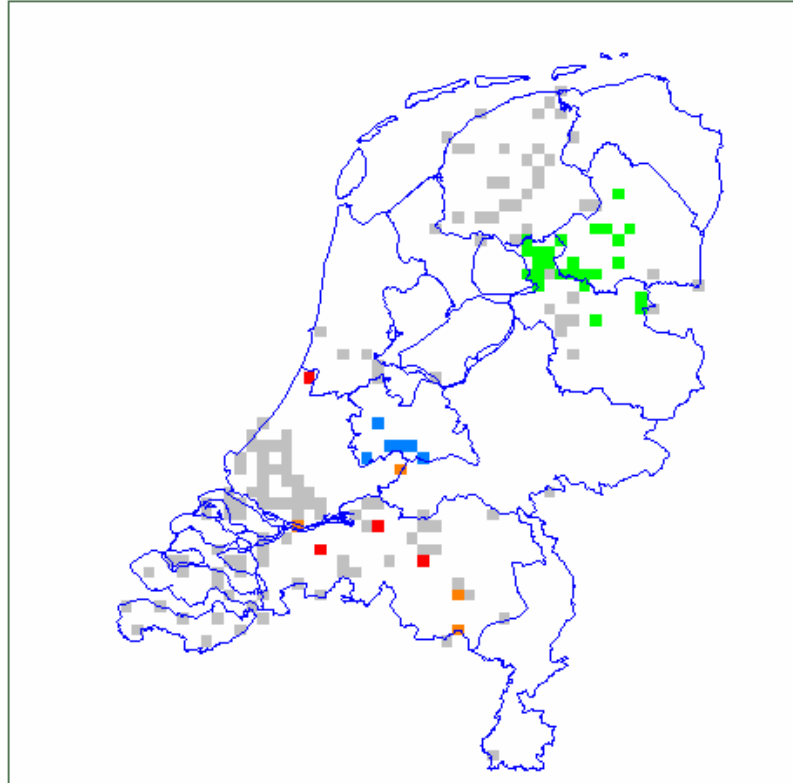

Resolutie:



MTR-Norm (Ecotoxicologie) - chloorfenvinfos - metingen 1999-2000 (5 x 5 km)

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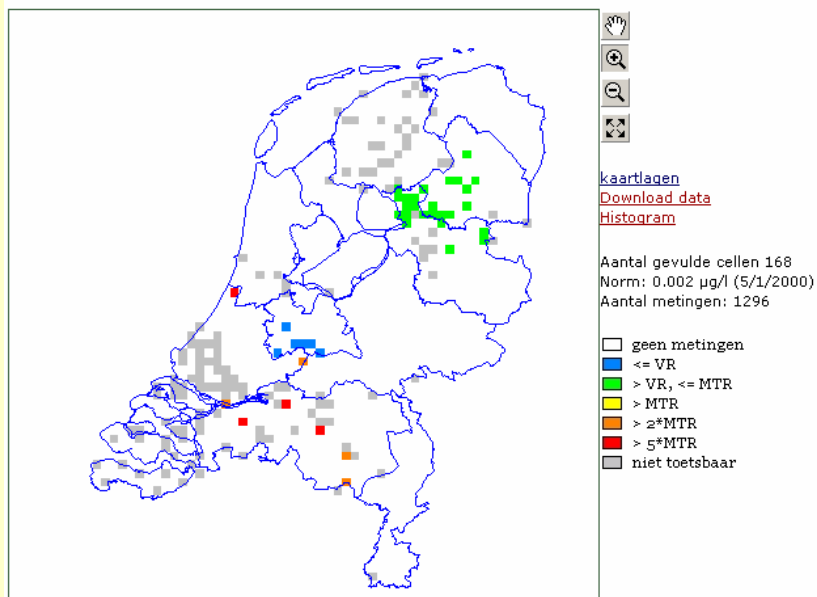


[kaartlagen](#)
[Download data](#)
[Histogram](#)

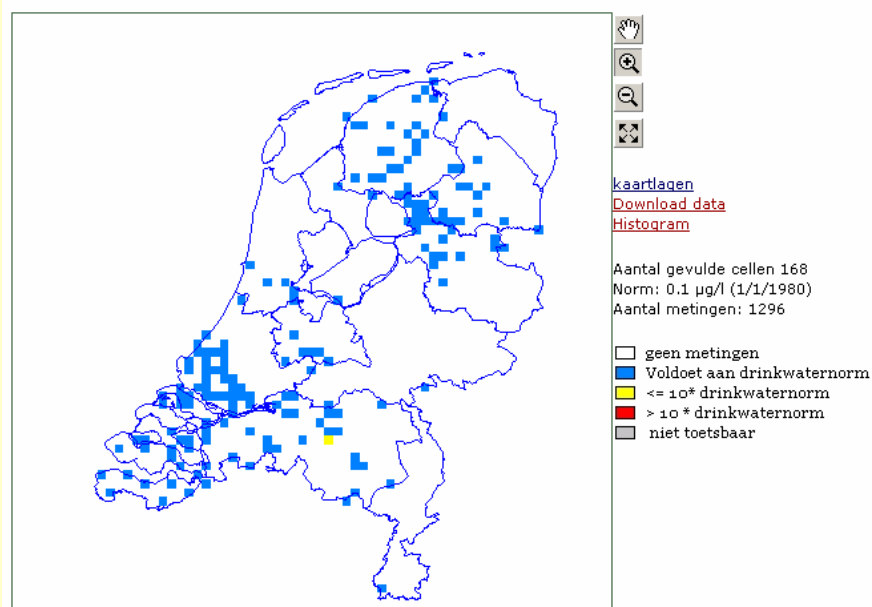
Aantal gevulde cellen 168
Norm: 0.002 µg/l (5/1/2000)
Aantal metingen: 1296

- geen metingen
- <= VR
- > VR, <= MTR
- > MTR
- > 2*MTR
- > 5*MTR
- niet toetsbaar

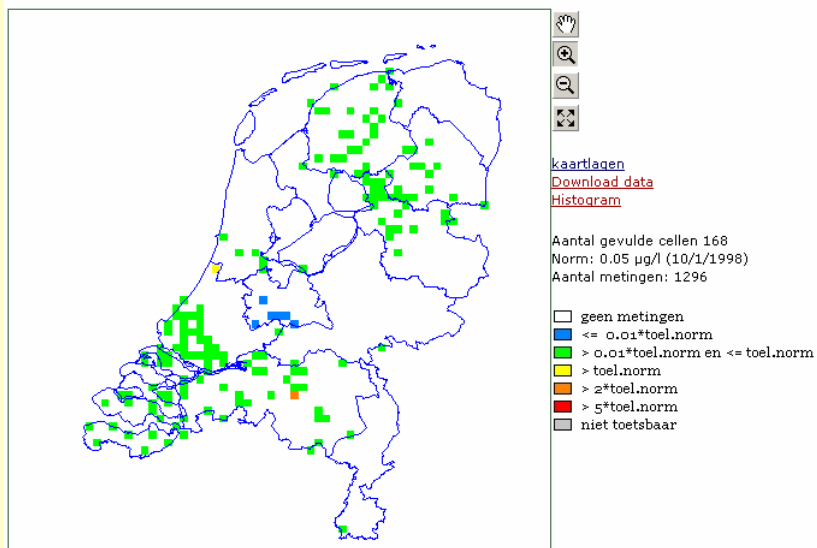
MTR-Norm (Ecotoxicologie) - chloorfenvinfos - metingen 1999-2000 (5 x 5 km)



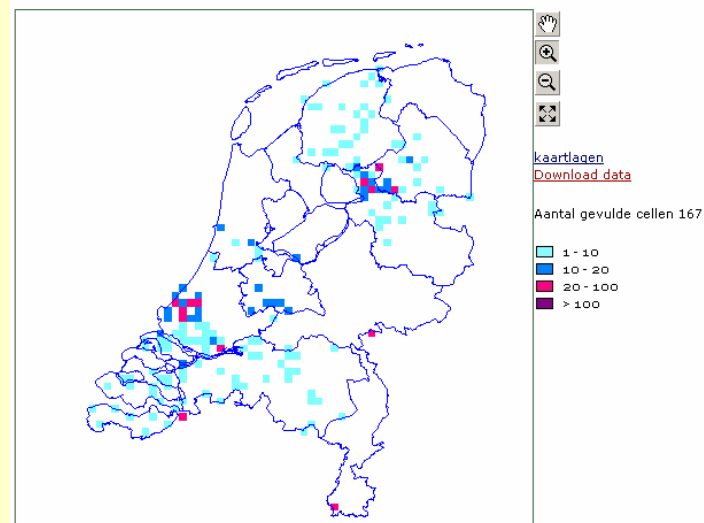
Drinkwaternorm - chloorfenvinfos - metingen 1999-2000 (5 x 5 km)



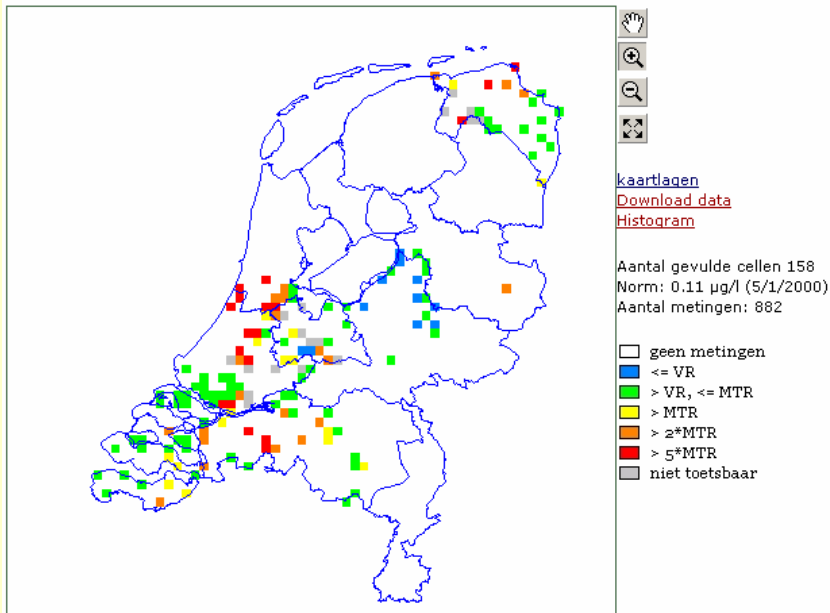
CTB-Norm (Toelating) - chloorfenvinfos - metingen 1999-2000 (5 x 5 km)



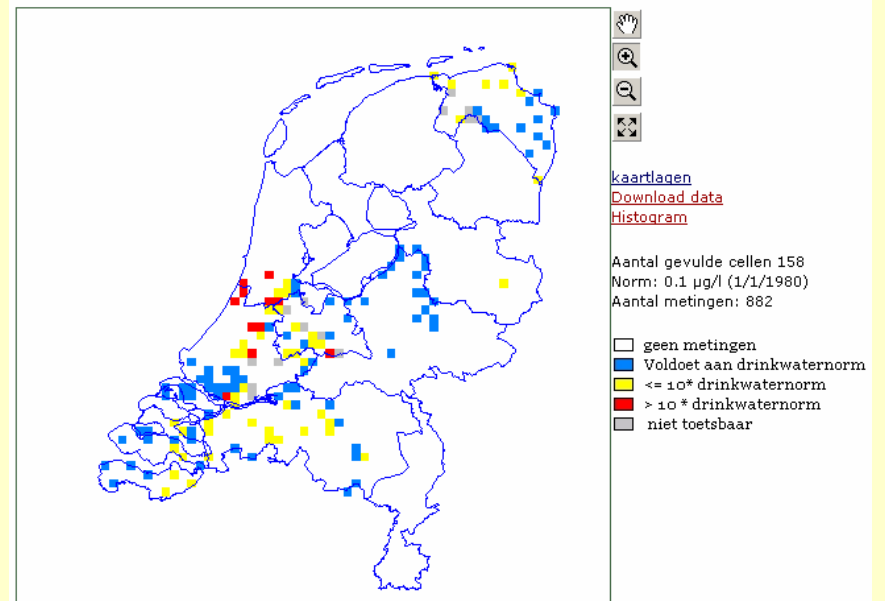
Aantal metingen per stof; Stof: chloorfenvinfos



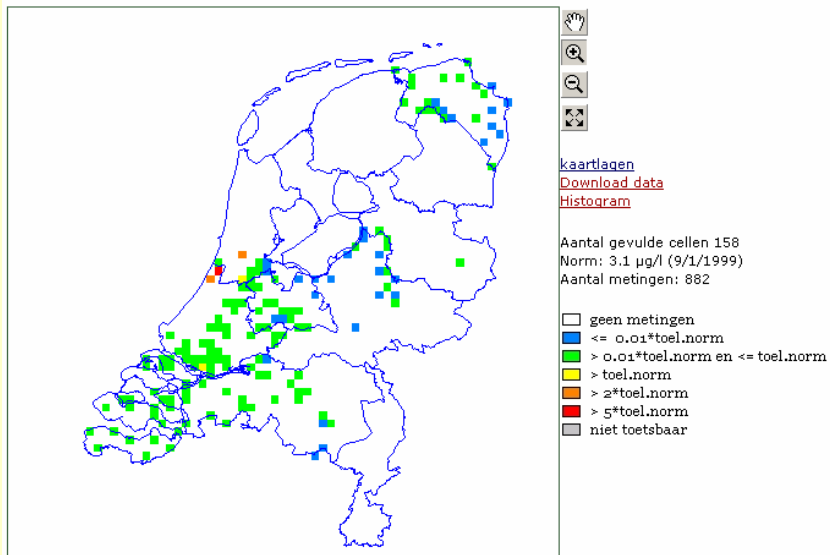
MTR-Norm (Ecotoxicologie) - carbendazim - metingen 1999-2000 (5 x 5 km)



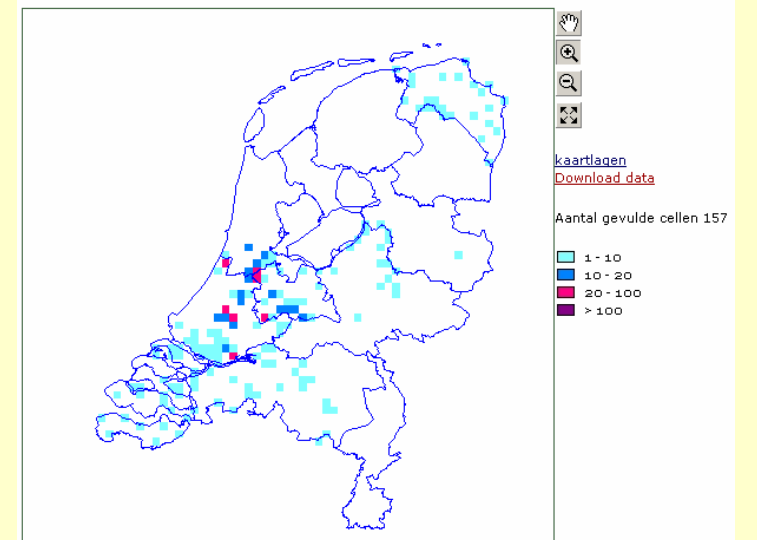
Drinkwaternorm - carbendazim - metingen 1999-2000 (5 x 5 km)



CTB-Norm (Toelating) - carbendazim - metingen 1999-2000 (5 x 5 km)



Aantal metingen per stof; Stof: chloorfenvinfos; Stof: carbendazim

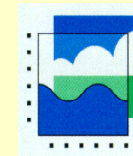


5 The pesticide atlas: Link with other GIS data:

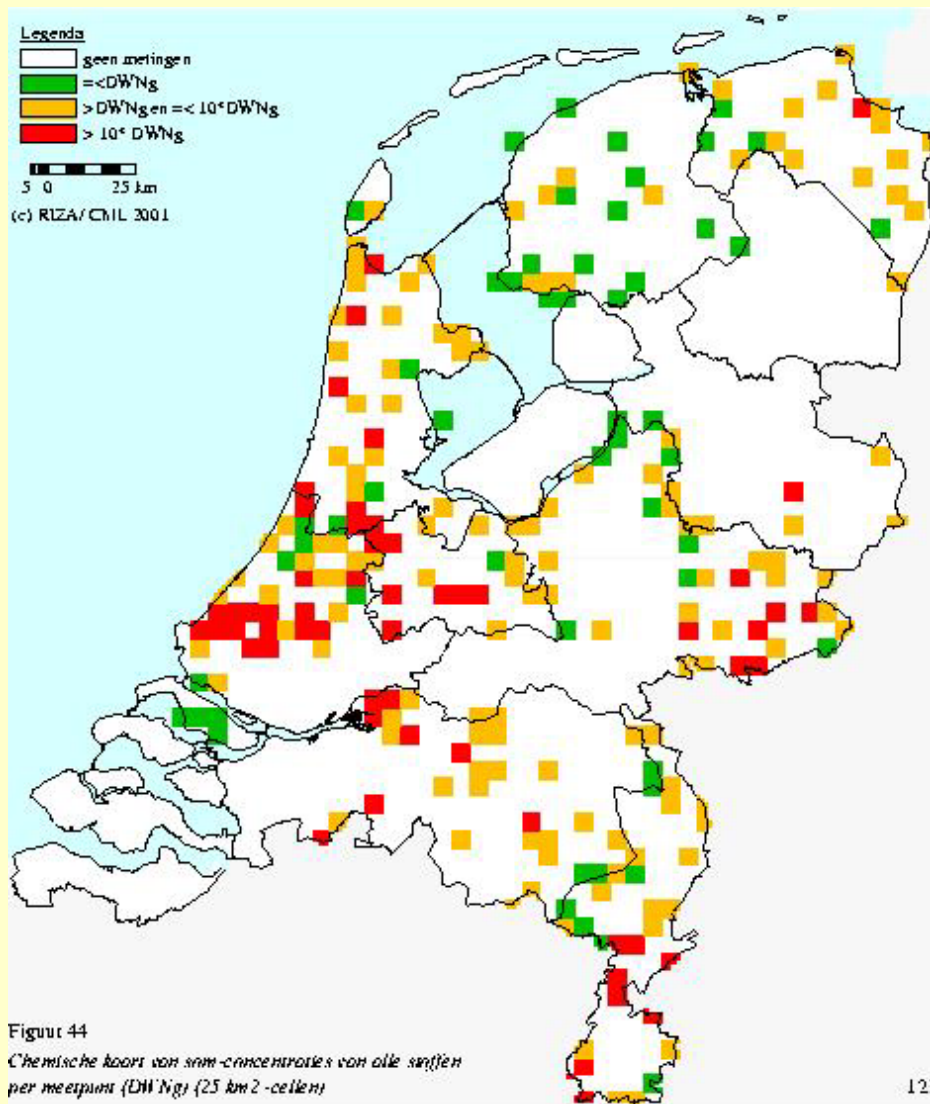
- Pesticide use data:
hardly at a regional
level available
- Land use data
(crops)
- Geographical fate
modeling
- Biological datasets



EU 0.5 $\mu\text{g/l}$ and arable land

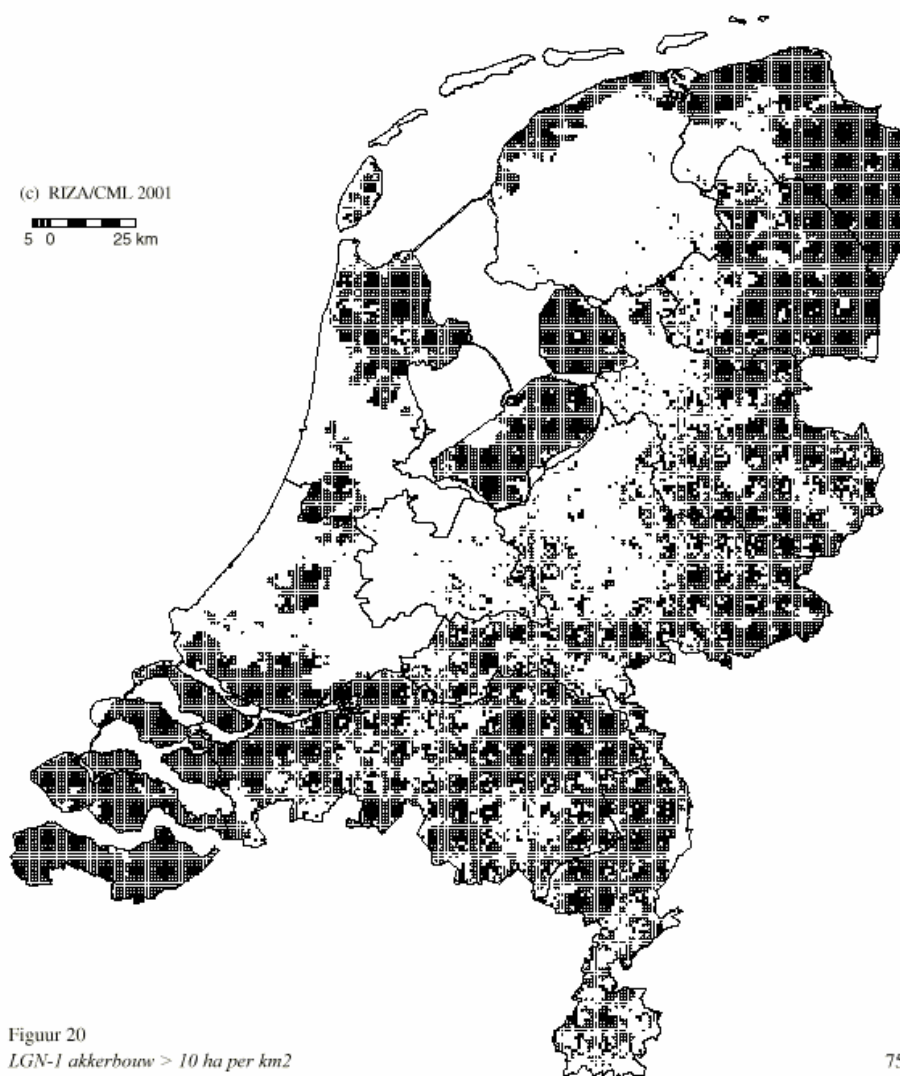


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Figuur 44
Chemische kaart van sm-concentraties van alle stoffen per meetpunt (DWNg) (25 km²-cellen)

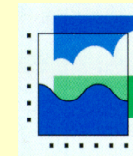
123



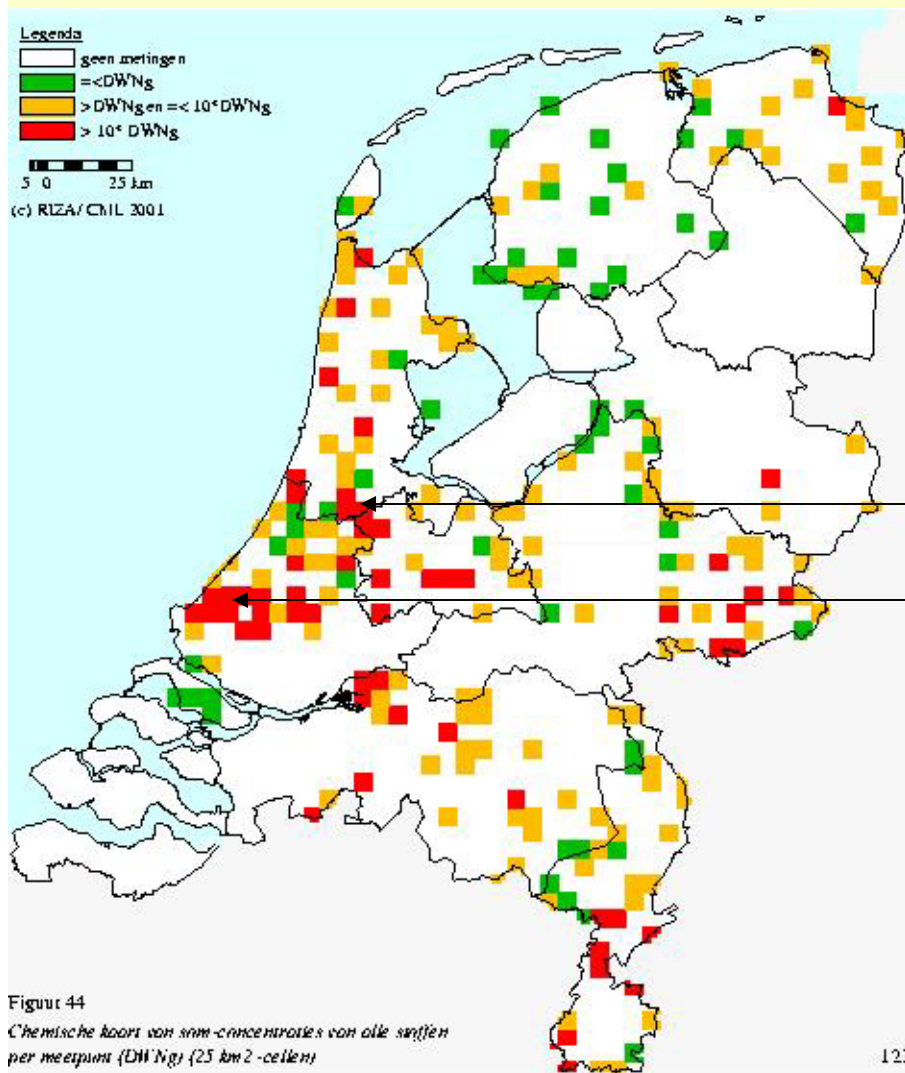
Figuur 20
LGN-1 akkerbouw > 10 ha per km²

75

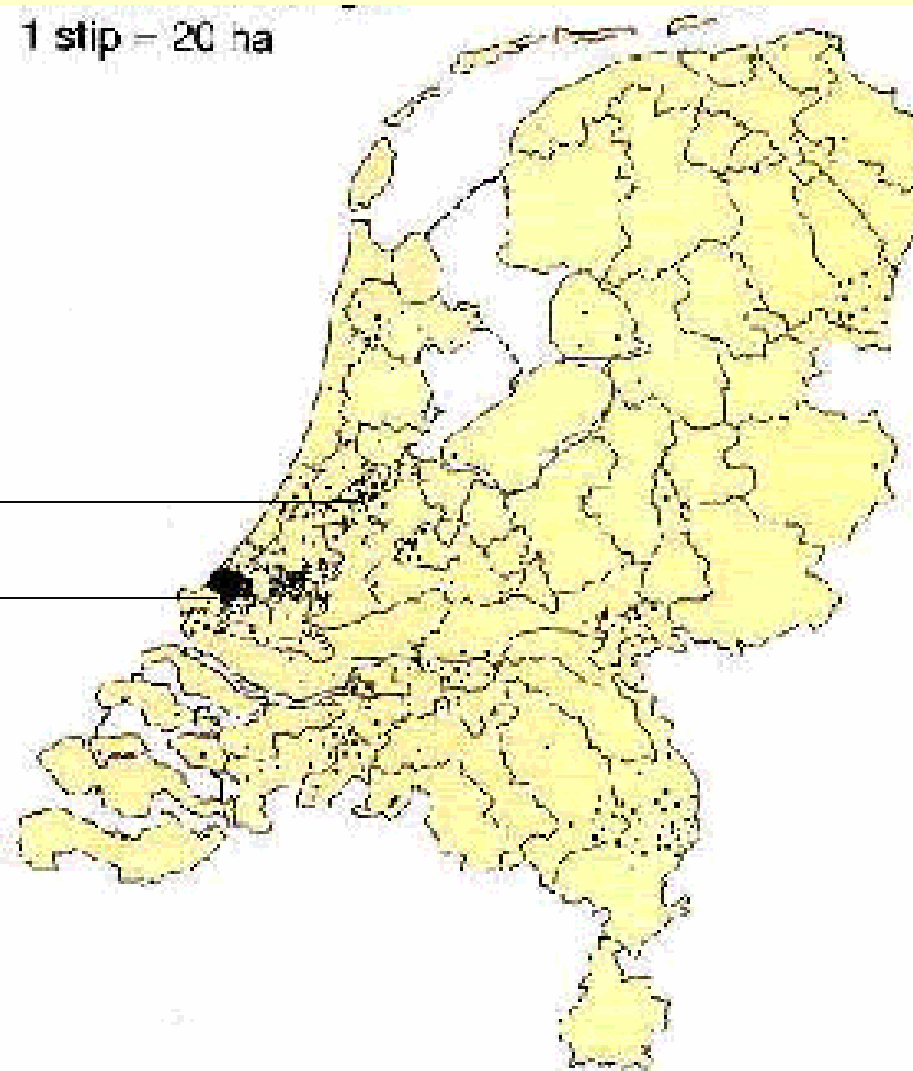
EU 0.5 $\mu\text{g/l}$ and greenhouse horticulture



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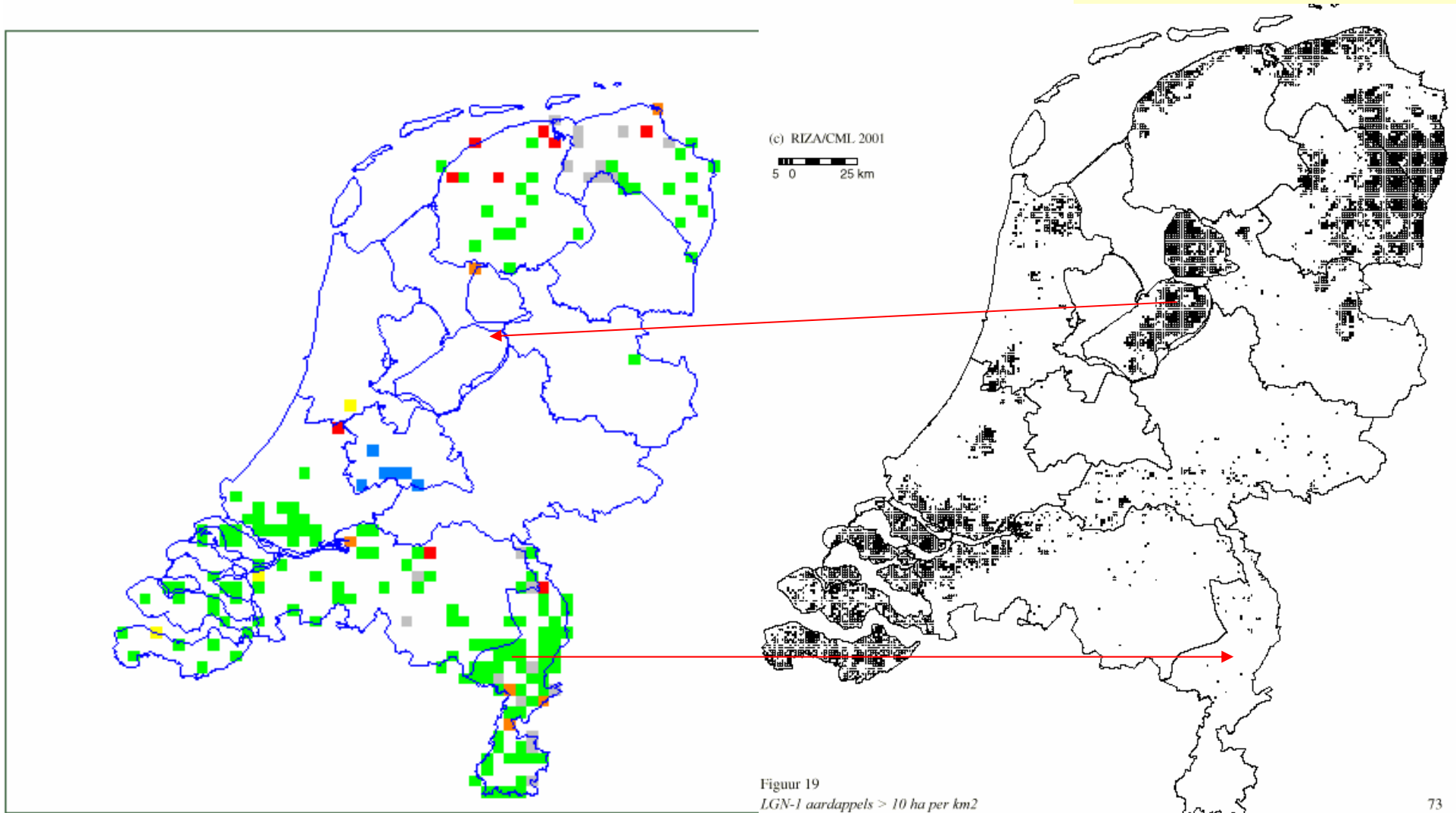
1 stip = 20 ha



Figuur 44
Chemische kaart van sm-c concentraties van alle stoffen
per meetpunt (DWNg) (25 km²-cellen)

Metribuzine (MTR) & potatoes (99%)

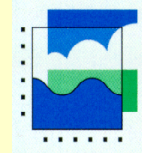
MTR-Norm (Ecotoxicologie) - metribuzine - metingen 1999-2000 (5 x 5 km)



Correlations: Carbendazim - crops

Gewas	Correlatie		normoverschrijding CTB
		significantie	significantie
Flower cultivation	0.52	***	***
Tree nursery	0.46	***	**
Strawberries	0.34	***	*
Vegetables	0.29	***	
Bulb cultivation	0.28	***	***
Onions	0.21	**	
Cabbage	0.21	**	
Granen	0.10		
Bonen	0.10		
Suikerbieten	0.08		
Prei	0.08		
Asperges	0.05		
Aardappelen	0.02		
Fruitteelt	-0.02		

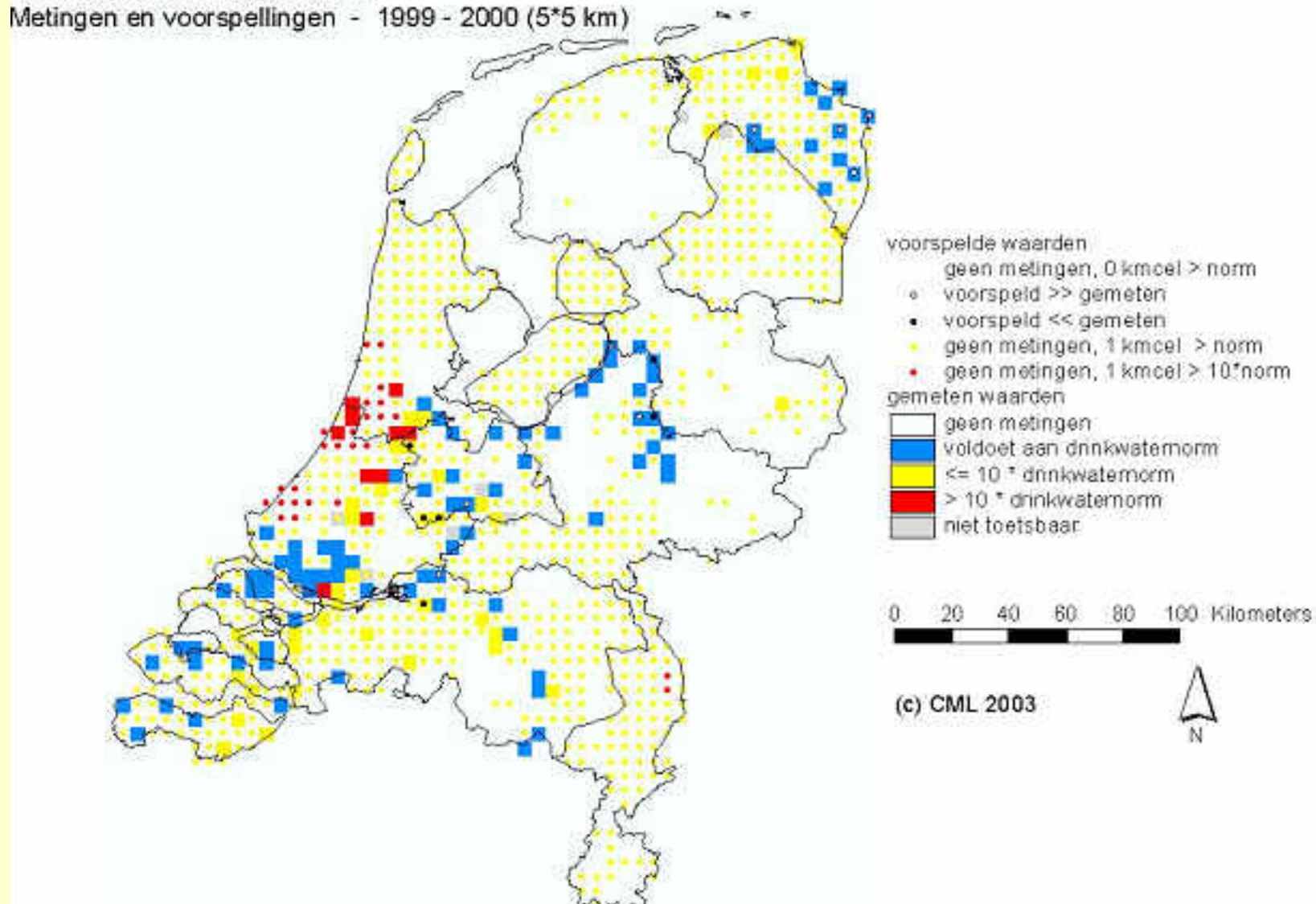
Predictions: carbendazim

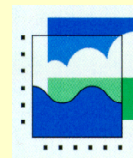


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Drinkwaternorm - carbendazim

Metingen en voorspellingen - 1999 - 2000 (5*5 km)





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6 Conclusions

1 Pesticide maps give relevant information:

- where and when is a pesticide measured, found and exceeding a standard
- Give no answers! Raising questions!

2 Regional monitoring systems can be improved for National surveys:

- measurements pesticide at relevant time
- measurements pesticide at relevant sites

Conclusions

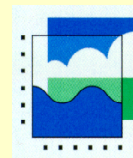


3 Linking pesticide concentrations with land use / pesticide use data

- In principle yes, specially for the a.i. used in few crops
- Will be worked out in more detail using statistical tools

4 Validation of predicted risks?

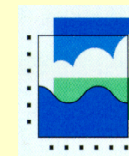
- Not yet done, highly interested
- Concentrations at unexpected times & locations



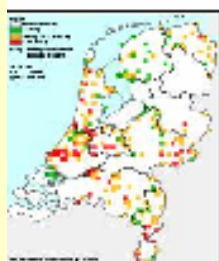
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Next step: 2004

- Linking pesticide concentrations and land use and pesticide use data with statistics
- International setting:
 - English version of Dutch Atlas
 - International cooperation!
 - www.pesticidesatlas.net



Pesticidesatlas Network



Links

- [Pesticidesatlas Netherlands \(Dutch\)](#) (CML / Royal Haskoning)
- [Pilot study - Pesticidesatlas Netherlands](#) (CML)
- [Article in Comm. Appl. Biol. Sci., Ghent University, 68\(4b\), 2003](#) (PDF-formaat, 560 kb)

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Cooperation

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[Alterra](#)

[LNV](#)

National Institute for Inland Water Management and Waste Water Treatment

The Netherlands Waterworks Association

Board for the Authorisation of Pesticides

Ministry of Housing, Spatial Planning and the Environment

The National Institute for Public Health and the Environment

Ministry of Agriculture, Nature and Food Quality

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