

Status of biocide monitoring in Germany

Report from North-Rhine Westphalia (NRW) – surface water

Workshop "Environmental monitoring of biocides in Europe - from prioritisation to measurements"

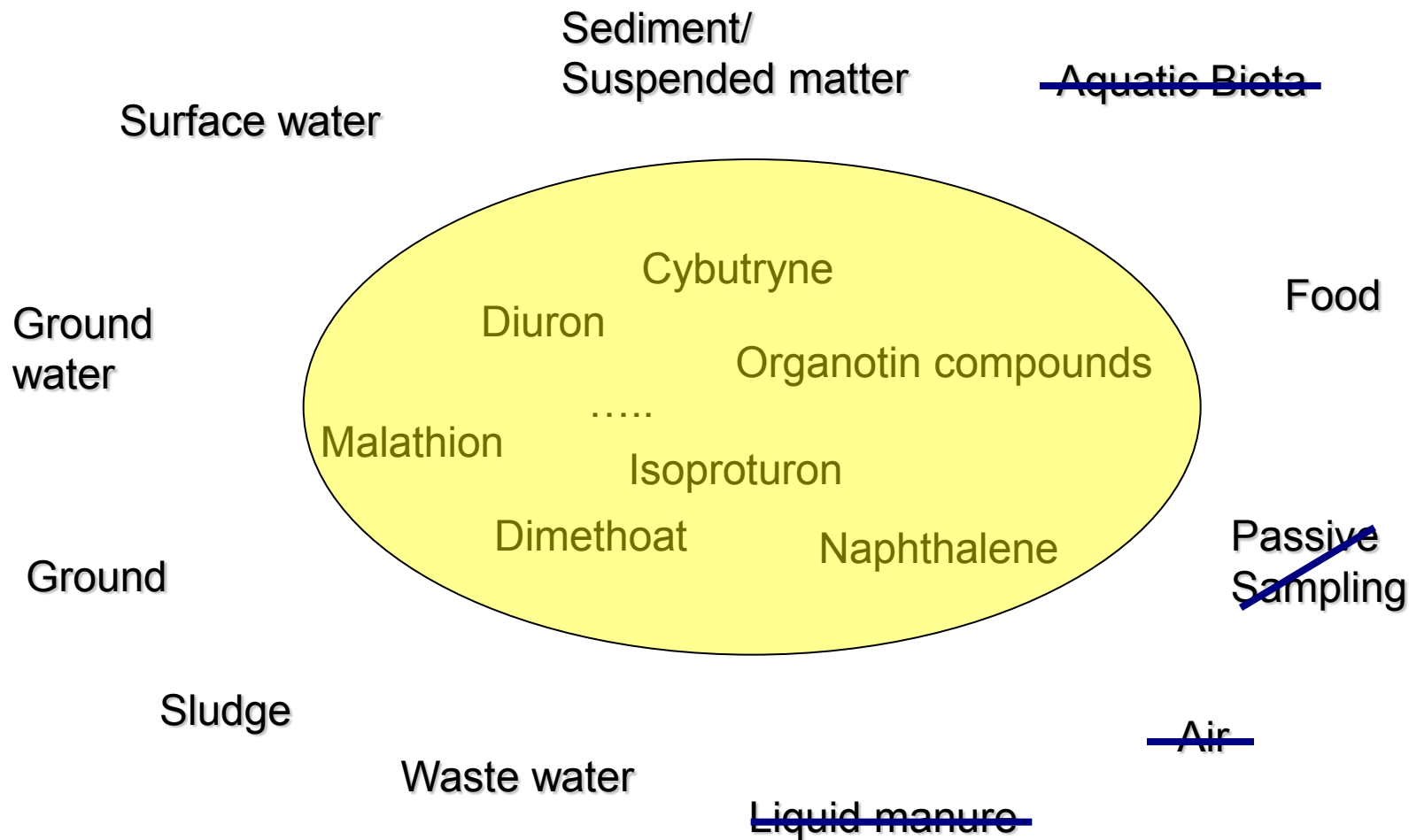
5./6.11.2012, Berlin

Session II – biocide monitoring in surface waters

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Biocide monitoring in NRW



Available data - A short overview

Matrix	Period of time	Substances
Surface water	Continual since the 80's	19 substances, e.g. Diuron, Isoproturon, Malathion, Naphthalin, Organotin compounds, ...
Suspended matter	Continual since the 90's	Mainly organotin compounds, Naphthalene
Sediments	Continual since the 90's	Mainly organotin compounds, Naphthalene
Ground water	Continual since the 80's	22 substances, e.g. Carbendazim, Diuron, Isoproturon, Malathion, Naphthalin ...
Waste water	Continual since the 80's	e.g. Diuron, Isoproturon, Terbutryn, Organotin compounds, Naphthalene
Sludge	unique	Organotin compounds
Ground	unique	Hexachlorcyclohexane, Naphthalene, Organotin Compounds, Diuron, ...



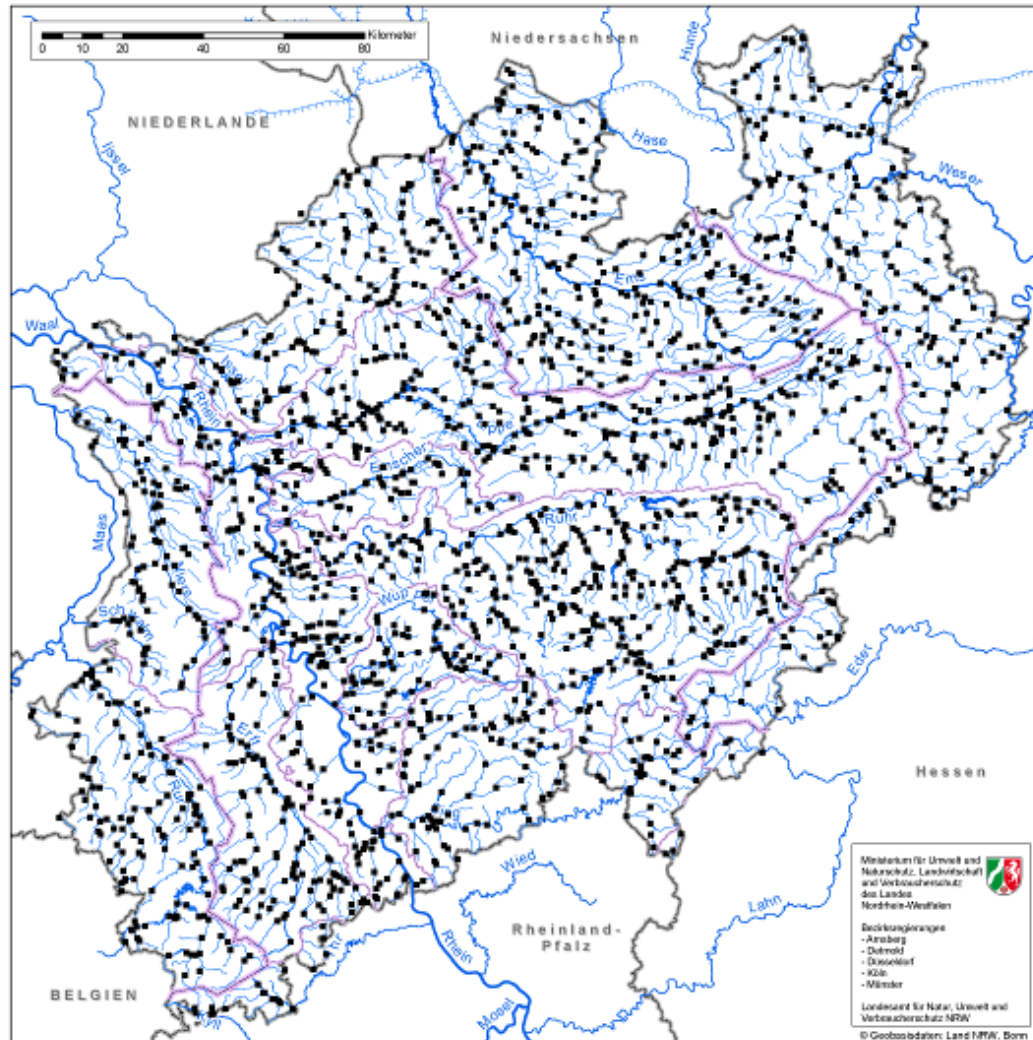
Monitoring of wastewater, groundwater and surfacewater in NRW

- **Waste water** monitoring
sampling based on German and EU legislation,
additional monitoring of biocides where possible
- Monitoring according to EU-WFD for **surface water**
chemical and physical values
from water, suspended matter and sediment
and a „realtime“ surveillance along the Rhine
- Monitoring according to EU-WFD for **ground water**
chemical and physical values

**Biocides are part of each monitoring program
– but there ist no special biocide monitoring to
meet the BPD!**



Surface water – WFD Monitoring NRW



Operative Messstellen an Oberflächengewässern in NRW

- Messstelle
- Grenzen Flussgebiete NRW
- Grenzen Teilinzugsgebiete NRW
- Staats-, Landesgrenze

Monitoring of substances depends on their relevance
(value > 1/2 EQS)

Stand: 30.06.09

Monitoring Guideline NRW: <http://wiki.flussgebiete.nrw.de/index.php/Monitoringleitf%C3%A4den>



Chemical analysis

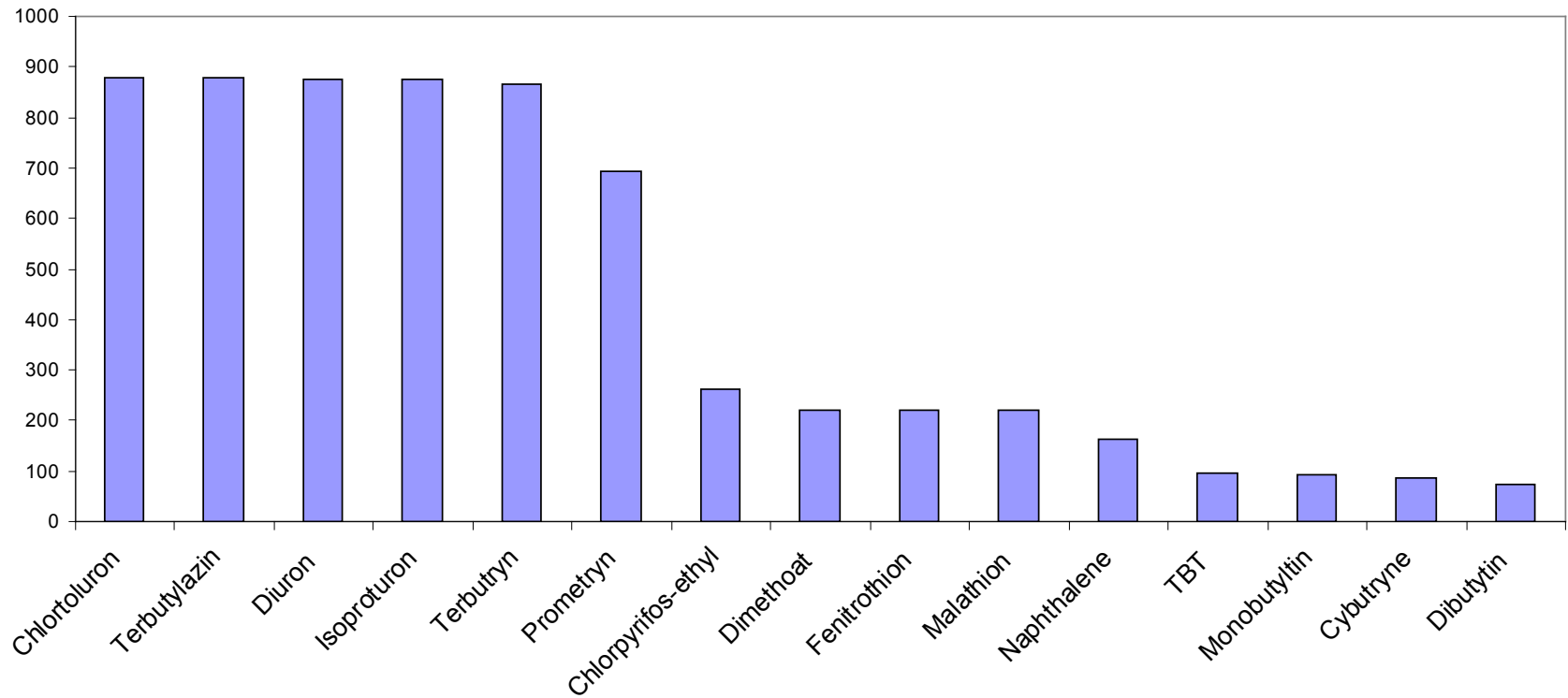
Substance groups are analysed in common

AMPA & Glyphosat	DIN 38407-F22
21 Aniline derivates	DIN 38407-F16
13 Chlorophenoles	DIN EN 12673
22 Chlorinated pesticides	DIN 38407-F2
16 Nitroaromatic compounds	DIN 38407-F17
8 PBDE	ISO CD 22032 (s)
37 Phosphorous compounds	EN ISO 10695 - F6
25 neutral/basic plant treatment agents	DIN EN ISO 11369
22 acid plant treatment agents (POC)	DIN 38407-35
6 organotin compounds	DIN EN ISO 17353(aq)
15 polycyclic aromatic hydrocarbons (PAH)	ISO/DIS 23161(s)
...	DIN EN ISO 17993



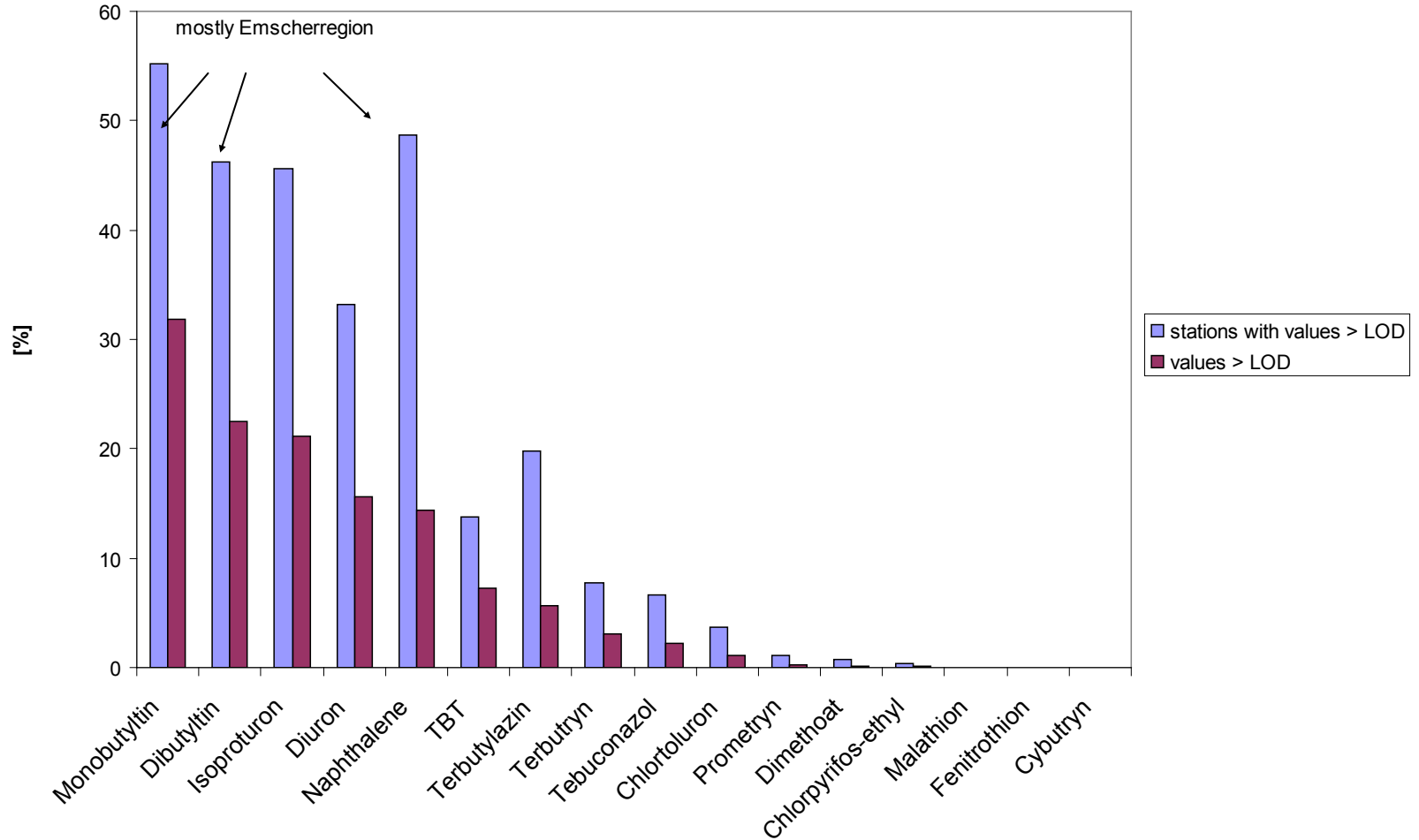
WFD monitoring: surface waters

Biocides: Number of monitored water bodies (2009 - 2011)



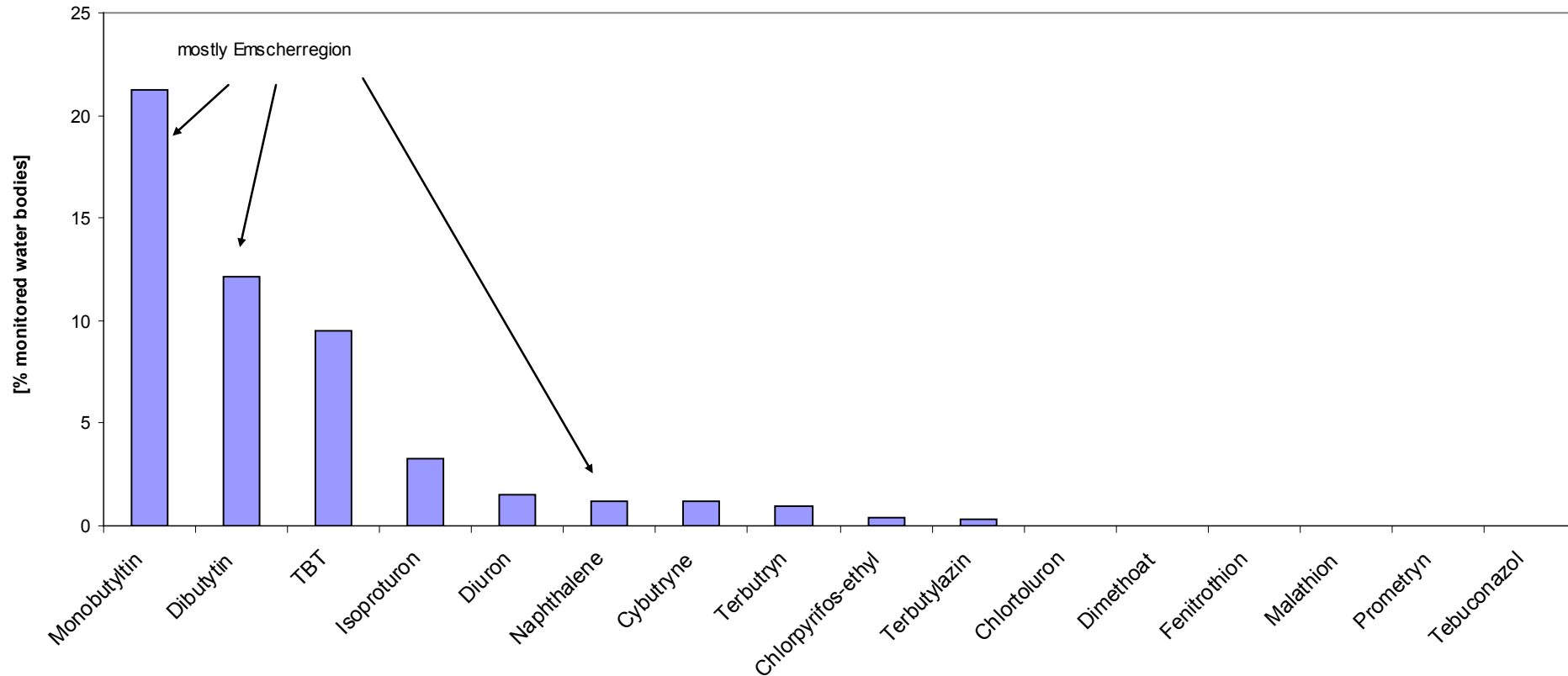
WFD monitoring: surface waters

Results for biocides (2008 - 2010)

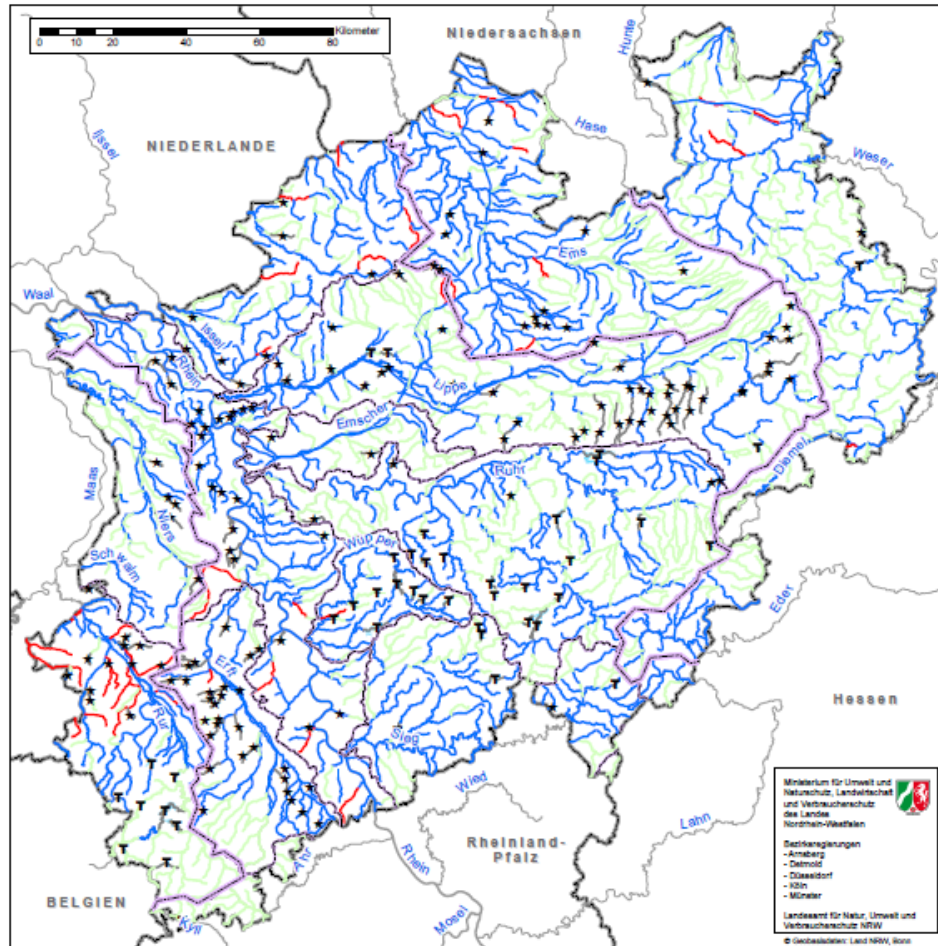


Surface waters – assessment in accordance to WFD

results > EQS / guide values (2009 - 2011, preliminary)



WFD monitoring: surface waters - Diuron



Chemischer Zustand der Fließgewässer

Prioritäre Pflanzenschutzmittel

Diuron im Wasser

Bewertung der Oberflächenwasserkörper

- gut
- gut gemäß Experteneinschätzung
- nicht gut
- keine Bewertung

- ★ Oberflächenwasserkörper zumindest zeitweise trocken
- ▲ Oberflächenwasserkörper Talsperre

- Grenzen Flussgebiete NRW
- Grenzen Teileinzugsgebiete NRW
- Staats-, Landesgrenze

Ministerium für Umwelt und
Naturschutz, Landschafts-
und Verbraucherschutz
des Landes
Nordrhein-Westfalen

Betriebsstellen
- Aachen
- Detmold
- Düsseldorf
- Köln
- Münster

Landesamt für Natur, Umwelt und
Verbraucherschutz NRW

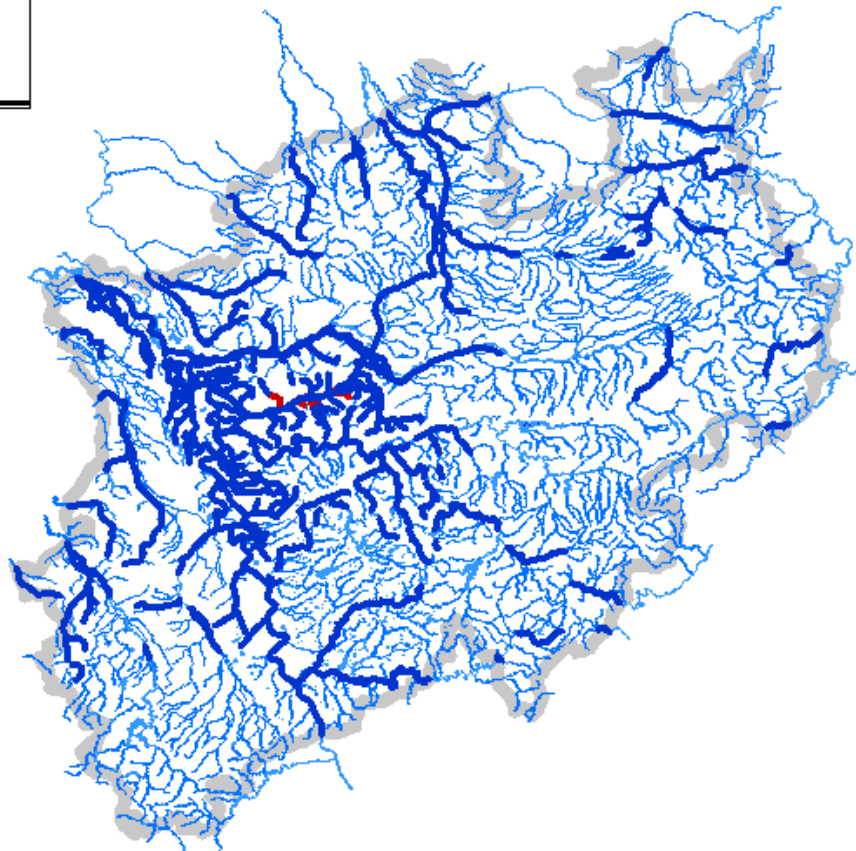
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Stand: 30.06.09

WFD monitoring: surface waters - Naphthalene

Naphthalene - results chemical status WFD (2007 - 2009)

Legende



2005 - 2007: Naphthalin -
Wasserphase (Chemischer Zustand)

Chemischer Zustand

- \leq QN ■ gut
- $>$ QN ■ nicht gut
- keine Bewertung

Ökologischer Zustand Chemie, ACP
und sonstige Parameter

- $<$ 1/2 QN ■ sehr gut
- \geq 1/2 QN - QN ■ gut
- $>$ QN ■ höchstens mäßig
- keine Bewertung

- Übersichtsgewässer (Flächen)
GSK3C
- Übersichtsgewässer (Linien)
GSK3C
- Seewasserkörper 3C



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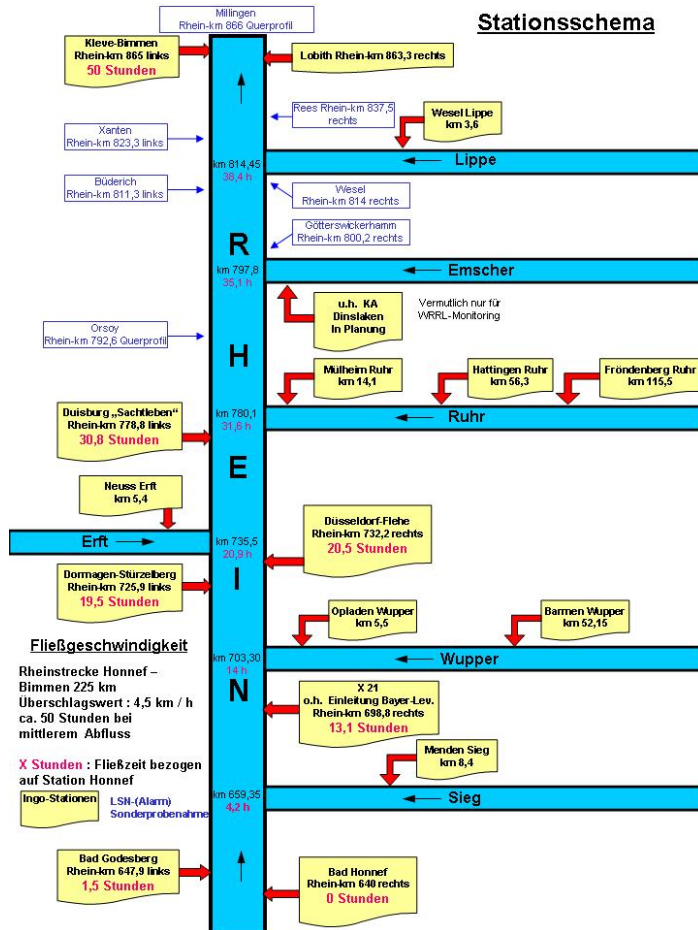
LANUV NRW

Datum 01.10.2012

Maßstab 1 : 2.183.942

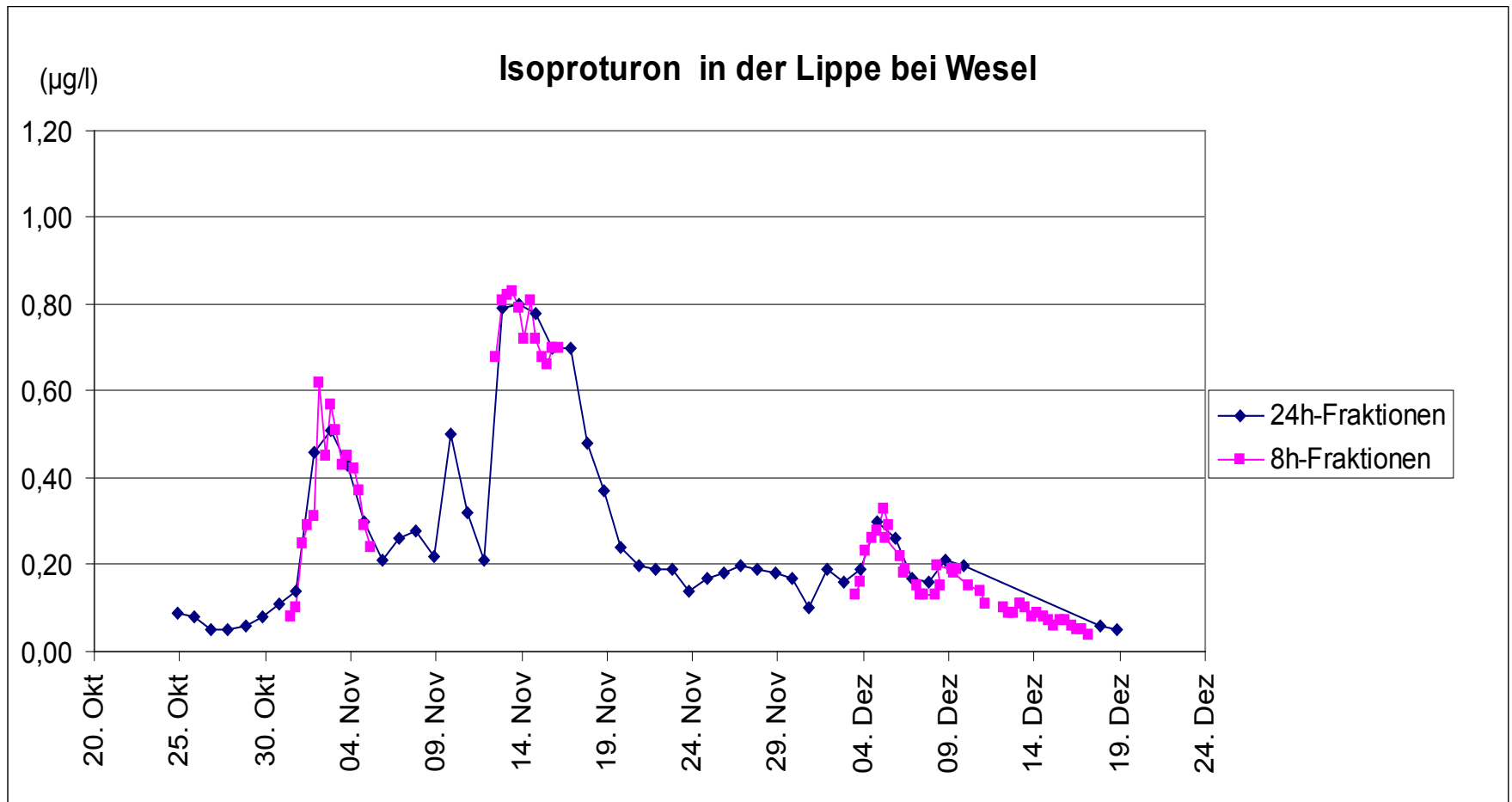
surveillance along the river Rhine

warning and alert system for drinking water-plants along Rhine and Ruhr

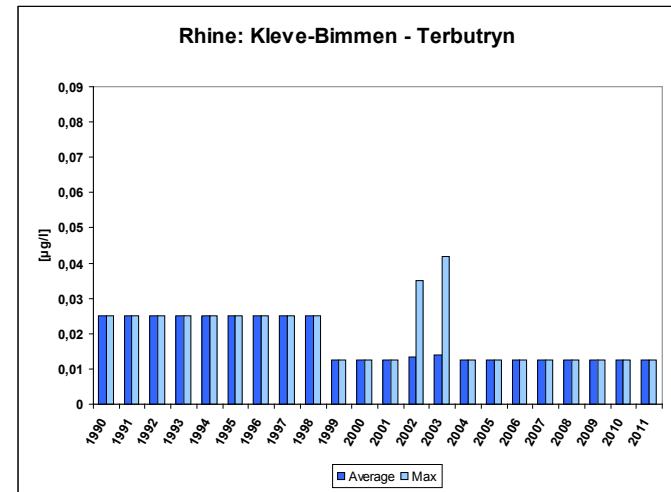
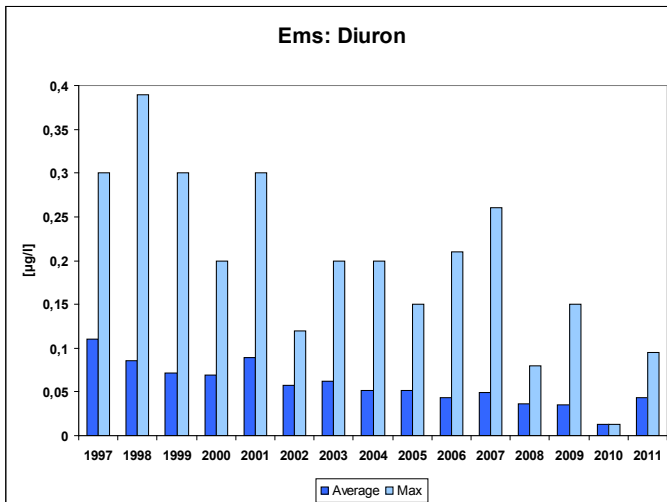
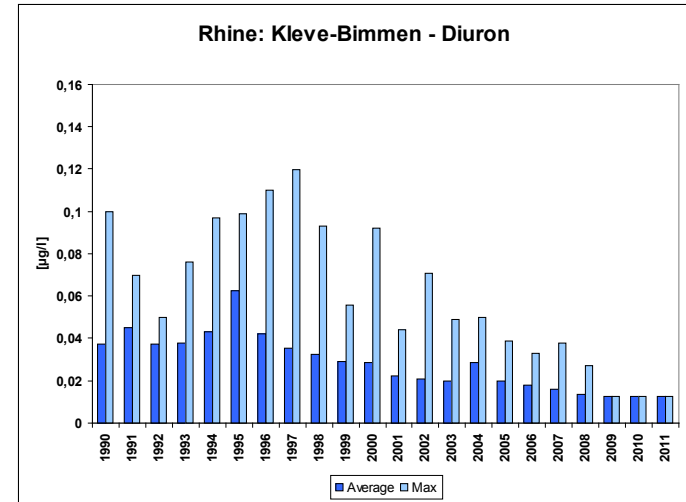
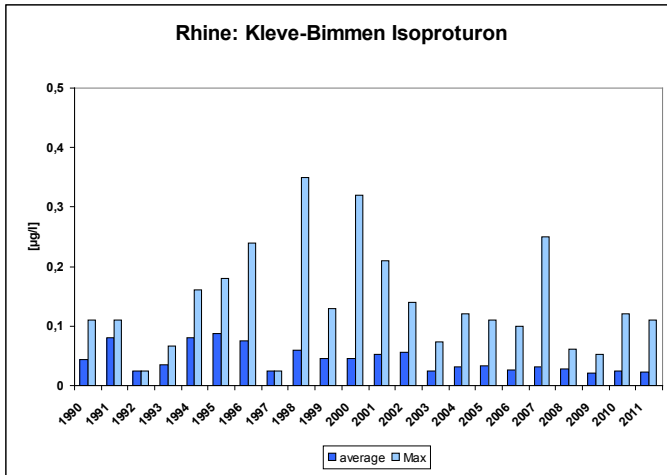


- chemical laboratory in Düsseldorf
- two continuous sampling stations with laboratories in Bad Honnef and Bimmen
- four automatic measuring and sampling stations along river Rhine
- seven stations in big tributaries
- three more stations for retain sampling
- Laboratory and sampling ship „Max Prüss“ in Duisburg
- possible cross-profile-sampling from Rhine-ferries

Example for time-scale sampling

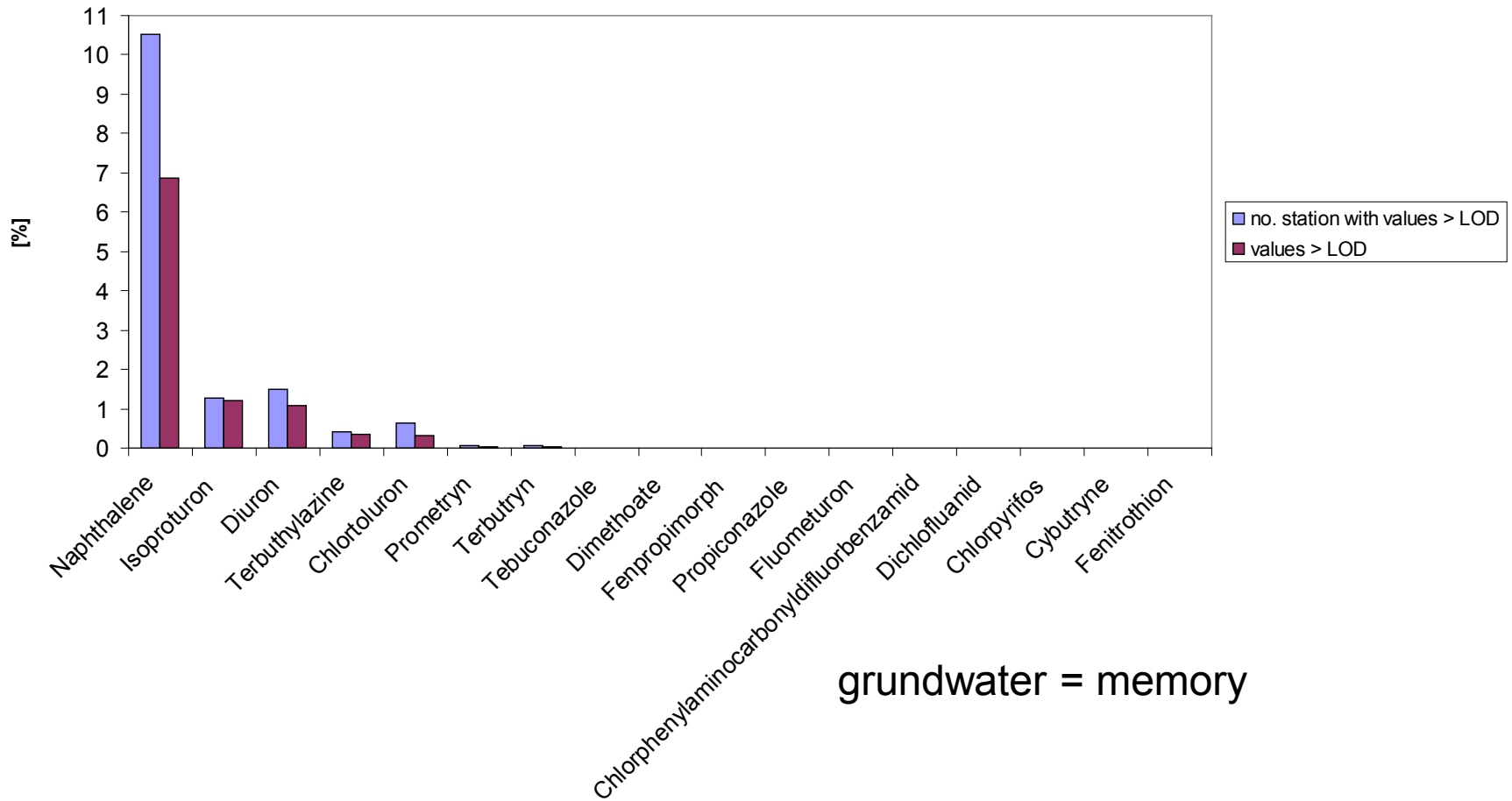


Surface water: Trends??



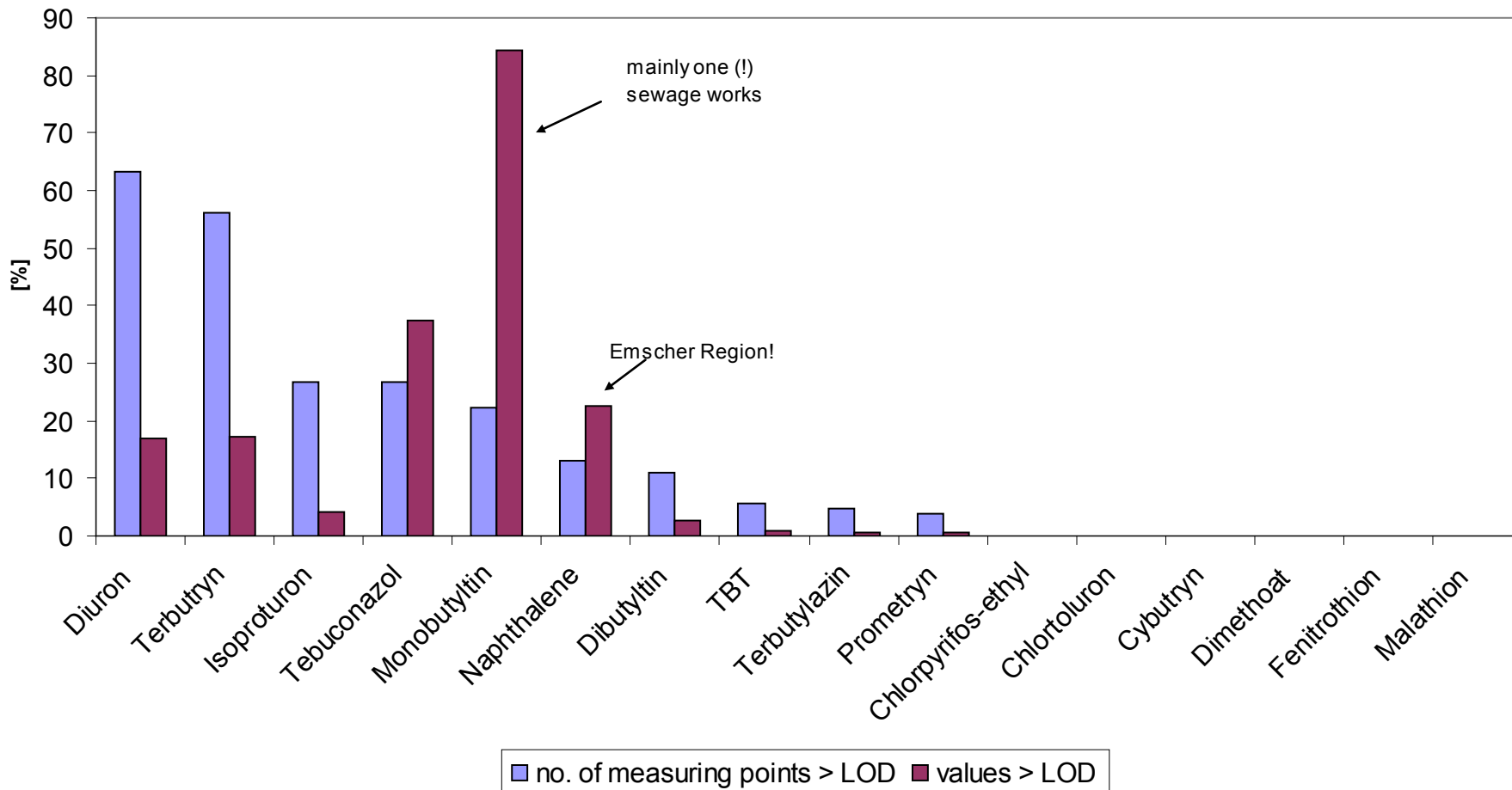
WFD monitoring: Ground Water

Examples of monitored biocides (2008 - 2010)



Waste Water: legal requirement and risk orientated investigations

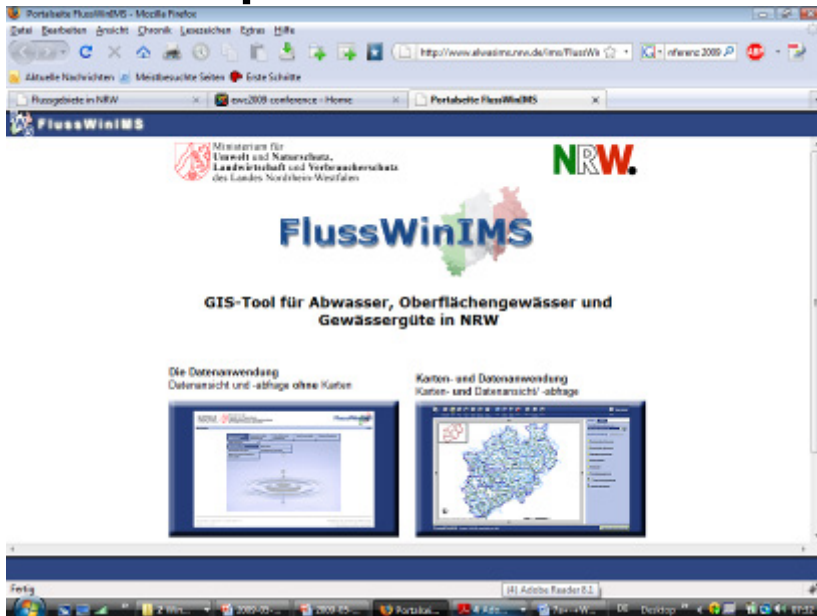
Results of risk orientated investigations of waste water (2006 - 2011)



Information tool: waste water, surface water, ground

Surface water/ waste water:

- **River Management Plan NRW**
<http://www.flussgebiete.nrw.de/Bewirtschaftungsplanung/index.jsp>
- **Internet**
<http://www.elwasims.nrw.de>



Stoffe	Stoffbezeichnung	Maßeinheit	09.07.2009	16.08.2009	23.09.2009	13.10.2009	30.04.2009	06.04.2009	23.03.2009	03.03.2009	24.02.2009	02.02.2009
501	Wassertemperatur	m3/8,5h	566	850,8	2028	1228	2238	1340	3530	2320	2330	1770
1011	Wassertemperatur	°C	22,2	22,4	22,9	20,9	19,8	17,5	13,0	16,4	13,9	13,9
1012	Wassertemperatur, erdennkerenwert (VW)	°C	22,0	21,8	22,8	21,8	20,8	18,9	14,1	17,0	15,0	15,0
1001	pH-Wert	-	7,3	7,2	7,3	7,3	7,2	7,1	7,1	7,6	7,4	7,3
1082	Elektrische Leitfähigkeit	µS/cm	128	188	172	204	182	183	121	147	104	109
1111	Lihtaus	mg/l										
1119	Boryllam	mg/l										
1123	Streßlam	mg/l										
1124	karlat	mg/l										
1132	maliam	mg/l										
1137	Zinn	mg/l										
1138	blei	mg/l	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
1141	Versäure	mg/l										
1142	Arzen	mg/l										
1145	Antimon	mg/l										
1151	Chrom	mg/l	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000
1155	Molybdän	mg/l	45,000	30,000	110,000	66,000	66,000	73,000	79,000	82,000	54,000	79,000

Ground:

- <http://w-du11-ims/fisstobo>

Information tool: current surface water quality

<http://www.lanuv.nrw.de/aktuelles/umwdat.htm>

Landesamt für Natur, Umwelt und Verbraucherschutz NRW
Messstationen
Erläuterungen
Meldungen Warn- und Alarmplan Rhein

Gewässergüte online
Karte

Messstellen:

- Kleve-Bimmen
- Lobith (NL)
- Düsseldorf**
- Dormagen-Stürzelberg
- Bad Godesberg
- Bad Honnef
- Wesel/Lippe
- Mülheim/Ruhr
- Hattingen/Ruhr
- Fröndenberg/Ruhr
- Neuss/Ertf
- Opladen/Wupper
- Menden/Sieg
- Porta/Weser

Alarmüberwachung
kontinuierliche Messungen
Monitoringdaten

Messwerte der Messstation Düsseldorf

Ergebnisse der Alarmüberwachung, vorläufige Werte aus Stichproben

1,1,1-Trichlorethan	< 0,05	µg/l	09.10.12 08:00	●
1,1,2-Trichlorethan	< 0,05	µg/l	09.10.12 08:00	●
1,2,4-Trimethylbenzol	< 0,05	µg/l	09.10.12 08:00	●
1,2-Dichlorbenzol	< 0,05	µg/l	09.10.12 08:00	●
1,2-Dichlorethan	< 0,05	µg/l	09.10.12 08:00	●
2-Chlortoluol	< 0,05	µg/l	09.10.12 08:00	●
2-Nitrotoluol	< 0,5	µg/l	27.07.12 08:00	●
3-Chlornitrobenzol	< 0,5	µg/l	27.07.12 08:00	●
Benzol	0,056	µg/l	09.10.12 08:00	●
Chlorbenzol	< 0,05	µg/l	09.10.12 08:00	●
cis-1,2-Dichlorethen	< 0,05	µg/l	09.10.12 08:00	●
Cumol	< 0,05	µg/l	09.10.12 08:00	●
Cyclohexan	< 0,05	µg/l	09.10.12 08:00	●
Diglyme	< 0,5	µg/l	27.07.12 08:00	●
Diisopropylether	< 0,05	µg/l	05.10.12 08:00	●
ESBE	< 0,05	µg/l	09.10.12 08:00	●
ETBE	< 0,05	µg/l	09.10.12 08:00	●
Ethylbenzol	< 0,05	µg/l	09.10.12 08:00	●

probe.php

Lokales Intranet

Start | _Vortrag Biozide - Micros... | Biozide NRW | 2012-09-29 Biozide NRW... | Isoproturon.PPT | abstract_Rahm-vietoris... | Landesamt für Natur, U... | Gewässerdaten - Micr... | 13:39

Results and Outlook: monitoring of biocides in water

Results:

- monitoring of biocides in surface water, waste water and ground water is necessary und useful
- relevant biocides in NRW: Isoproturon, Diuron, Terbutryn, organotin compounds; local: naphthalene (industrial sources)
- EQS-excess: less than 3% of surface waters (length), mostly regional and in smaller brooks
- positive trends for many biocides positive, not for all, e.g. Isoproturon

Outlook:

- Trend monitoring and overview will continued according to WFD
- Improvements:
 - event-related monitoring to find maximum concentrations in smaller rivers and brooks
 - monitoring of „new“ biocides according to emission aspects, ecotoxicological effects
 - evaluating substance-lists for relevance
 - better combination with drinking water monitoring
- adapting WFD-monitoring