

The NORMAN network

Special view on biocides as emerging substances

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Network of reference laboratories, research centers and related organisations for monitoring of emerging environmental substances

Working Groups

- Former EU-funded FP6 project (2005-2008), established as a **permanent network (NORMAN Association) since 2009**
- >60 members from EU leading organisations (from 19 European countries and Canada)

1) Prioritisation

2) Bioassays

Mission:

- Exchange information on emerging substances
- Improve data quality
- Promote synergies among research teams and more efficient transfer of research findings to policy-makers

3) Effect-Directed Analysis

4) Engineered Nanoparticles

5) Wastewater reuse

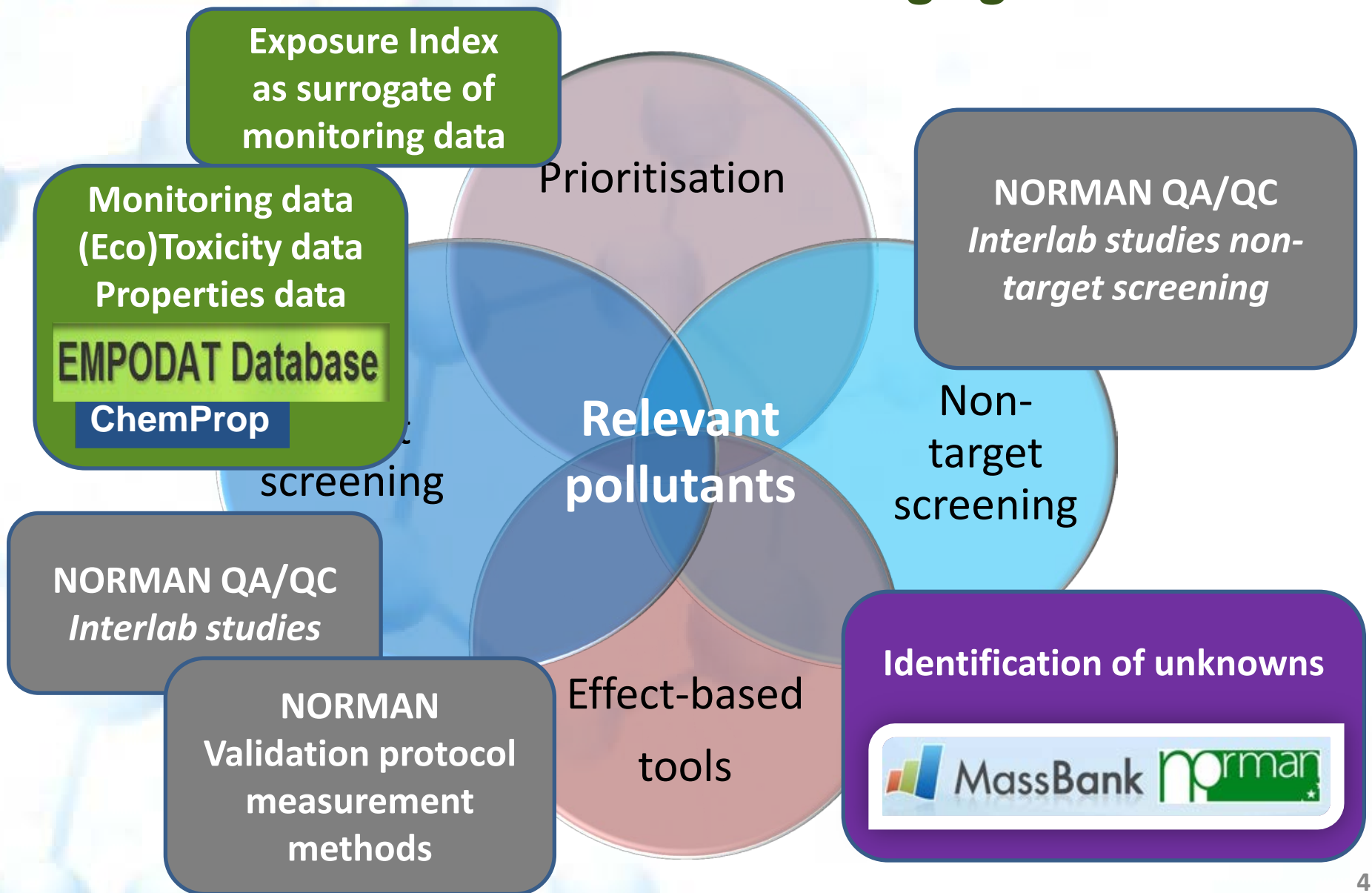
6) Indoor environment



Emerging substances and emerging risks

- Substances not included in regular monitoring programmes at EU-wide level
- Chronic effects at low doses
- Candidates for future regulations
 - Research results about their effects and associated risks on human health and ecosystems
- **Which** are those that deserve **priority** attention for **further actions**?

NORMAN strategy for identification of relevant emerging substances



Working Groups

NORMAN Bulletin

NORMAN
Network of reference laboratories, research centres and related organisations for monitoring of emerging environmental substances

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- DATABASES
- Topics and Activities
- Workshops and Events
- QA/QC Issues
- Glossary
- Useful links

WELCOME TO THE NORMAN NETWORK

The NORMAN network enhances the exchange of information on emerging environmental substances, and encourages the validation and implementation of common measurement methods and monitoring systems. The requirements of risk assessors and risk managers can be better met. It specifically seeks both to promote and to benefit from the synergies between research teams from different countries in the field of emerging substances.

Who should be part of the network?

All interested stakeholders dealing with emerging substances – whether in studying their occurrence and effects or risk assessment and risk management:

- Competent authorities / Reference laboratories: i.e. institutes and organisations designated by the competent authorities at the national level to offer technical and scientific support in specific fields related to environmental protection.
- Research centres and academia.

Highlights

- New NORMAN Working Group on Indoor Environment and contaminants of emerging concern - Kick-off meeting, 8-9 December 2014, at IVM, Amsterdam
- 6th NORMAN General Assembly meeting took place on 9-10 December at IVM, Amsterdam
- Workshop on 'Passive Sampling for monitoring of contaminants in the aquatic environment: Achievements to date and future perspectives'
- Screening campaign of selected antibiotic resistance determinants and mobile genetic elements (AR/MGE) in WWTPs in Europe - announcement and invitation for participation
- Cost Action ES1403 - New and emerging challenges and opportunities in wastewater reuse - NEREUS

[ARCHIVE](#)

Recent events

Date	Title

Databases

Workshops

Interlaboratory studies

<http://www.norman-network.net>



NORMAN EMPODAT Database Chemical Module

Search

Factsheets

Statistics

NORMAN - EMPODAT Database

Network of reference laboratories, research centres and related organisations for monitoring

- Home
- Search
- Factsheets
- Statistics
- Quality evaluation
- Data Download
- DCT

Search the database

Please select fields in which you want to search

Search options

- At least one of the selected criteria must comply
- All the selected criteria must comply

If no criteria is selected, the result of search will be the overall database.
 Exporting of data into excel is possible only for single matrix, since the structure of datasets is different for each matrix.
 Search criteria (for selection of multiple items hold down the CTRL key):

Country Austria Belgium Bulgaria Croatia Cyprus	Ecosystems/matrices Water - Surface water - River water Water - Surface water - Lake water Water - Surface water - Transitional water Water - Surface water - Coastal water Water - Surface water - Territorial (marine) water	Sampling site/station <input type="text"/>
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Determinand/measurand

6.5 Millions datasets

43

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Information Platform for Chemical Monitoring

Who is participating

IPChem is an initiative of the European Commission, coordinate by Directorate-General Environment (Chef de File) and Joint Research Centre (technical coordinator, IES and Module Coordinator for "Product and Indoor air, IHCP).

These are the institutions currently* involved in the implementation of IPChem and data provision.
 The list is constantly updated.

European Agencies

- efsa** European Food Safety Authority (Module Coordinator "Food & Feed monitoring")
- eea** European Environmental Agency (Module Coordinator "Environment and Human biomonitoring")
- ECHA** European Chemical Agency (member)

National Bodies

- Research in Bavaria** Federal Environmental Agency - UBA (Germany)
- Research in Belgium** Federal Public Service Health, Food Chain Safety and Environment - Belgium
- Research in Flanders** Flemish Centre of Expertise on Environment and Health - Belgium

Research and Academia



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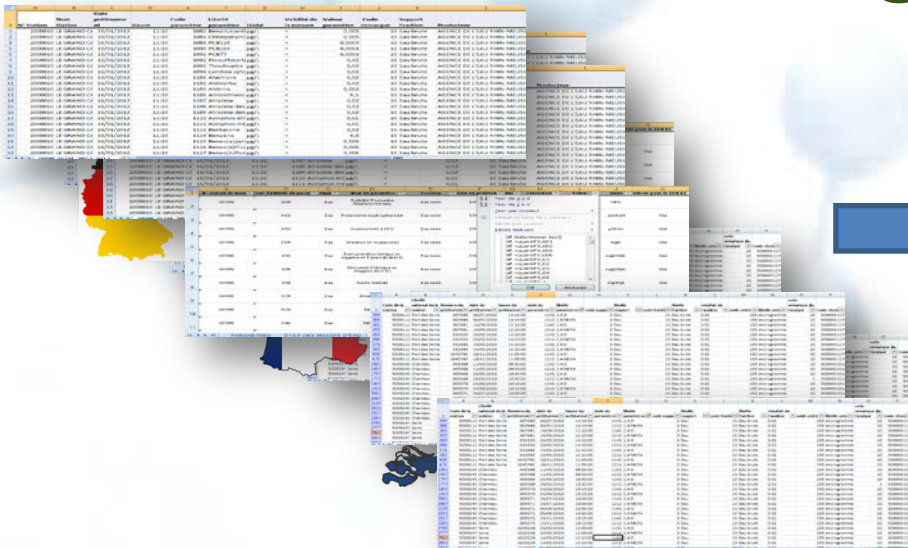
<http://www.norman-network.net/empodat/>

ALL data accessible after registration

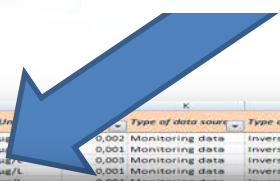


NORMAN EMPODAT:

Monitoring data collection in EU



NORMAN IT Experts



Sample matrix	Fraction	Individual compound	CAS Number	NORMAN Substance	Concentration	Value	Unit	Type of data source	Type of monitoring	Analytical	Relevant Ec code
16	Surface water - River water	Dissolved water	Sulfamethoxazole	723-46-6	Less than LoQ	0,002	µg/L	Monitoring data	Investigative	LC-MS/MS	FRAR01016000
17	Surface water - River water	Dissolved water	Triadiménoï	55219-65-3	Less than LoQ	0,001	µg/L	Monitoring data	Investigative	LC-MS/MS	FRAR01016000
18	Surface water - River water	Dissolved water	Triclosan	3580-34-5	Less than LoQ	0,001	µg/L	Monitoring data	Investigative	LC-MS/MS	FRAR01016000
19	Surface water - River water	Dissolved water	Carbendazim	10605-21-7	Individual value	0,053	µg/L	Monitoring data	Investigative	LC-MS/MS	FRAR01016000
20	Surface water - River water	Dissolved water	Ofloxacin	82419-36-1	Individual value	0,442	µg/L	Monitoring data	Investigative	LC-MS/MS	FRAR01016000
21	Surface water - River water	Dissolved water	Acétochlor	94256-82-1	Individual value	0,03	µg/L	Monitoring data	Investigative	LC-MS/MS	FRAR01016000

NORMAN gathers data in a standard, interchangeable format which facilitates exploitation of the data across Europe

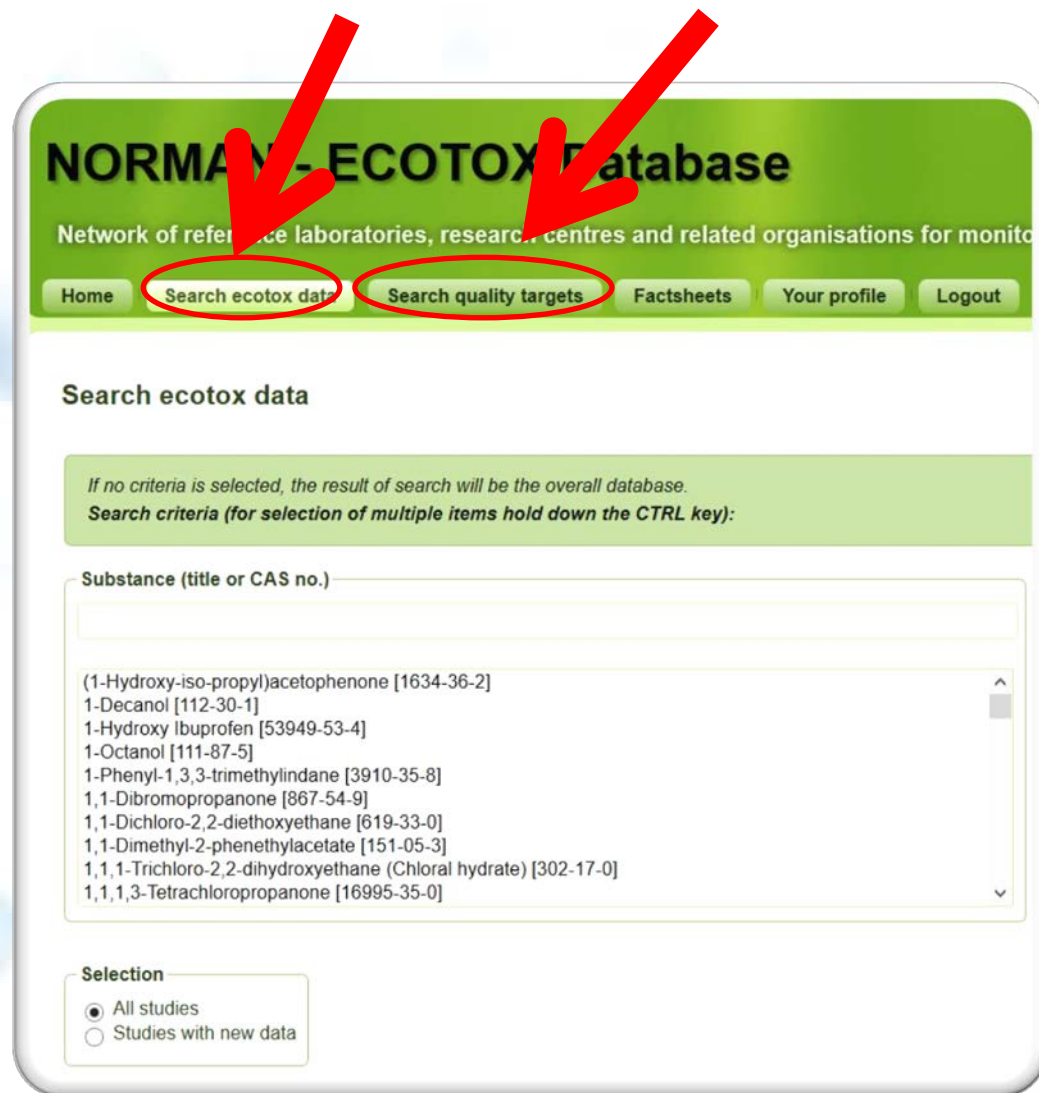


EMPODAT Database

NORMAN EMPODAT: the Ecotox Data Module

- Compilation of experimental ecotox data from databases
→ about 500 substances
- QSAR prediction for substances with no experimental data
→ all substances
- Collection of existing Quality targets (PNECs)
→ about 200 substances

→ Derivation of the **Lowest PNEC** by NORMAN experts



NORMAN-ECOTOX Database
Network of reference laboratories, research centres and related organisations for monitoring

Home Search ecotox data Search quality targets Factsheets Your profile Logout

Search ecotox data

*If no criteria is selected, the result of search will be the overall database.
Search criteria (for selection of multiple items hold down the CTRL key):*

Substance (title or CAS no.)

(1-Hydroxy-iso-propyl)acetophenone [1634-36-2]
1-Decanol [112-30-1]
1-Hydroxy ibuprofen [53949-53-4]
1-Octanol [111-87-5]
1-Phenyl-1,3,3-trimethylindane [3910-35-8]
1,1-Dibromopropanone [867-54-9]
1,1-Dichloro-2,2-diethoxyethane [619-33-0]
1,1-Dimethyl-2-phenethylacetate [151-05-3]
1,1,1-Trichloro-2,2-dihydroxyethane (Chloral hydrate) [302-17-0]
1,1,1,3-Tetrachloropropanone [16995-35-0]

Selection

All studies
 Studies with new data

List of NORMAN emerging substances

Delete / hide

- **38 compounds :**
 - WFD PS (diuron, dichlorvos, dicofol, heptachlor, PCBs, BDE -47, BDE-153, BDE-154, HBCDD, PAHs, PFOS, etc.)
 - Microcystines
 - Well known Industrial Chem. (aniline, styrene, toluene, xylenes, etc.)

Former emerging substance

- **72 compounds :**
 - Phthalates
 - Organotins
 - Nitro musks
 - Organo-lead
 - 8 well known PFASs
 - 23 herbicides / insecticides, banned in EU and /or not frequently detected / quantif
 - 10 surfactants (NPEOs, LAS)

Keep on NORMAN List

- **527 compounds**
 - 8 Plasticisers
 - 73 PPP
 - **20 PPP / biocides or biocides**
 - 209 Pharmas
 - 60 Pers care prod.
 - 16 Flame retard.
 - 44 Ind. Chemicals
 - 8 PFASs,etc.
- **61 DBP (only drinking water)**

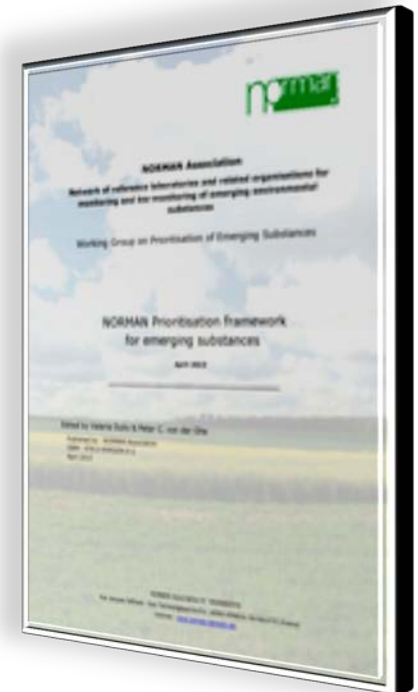
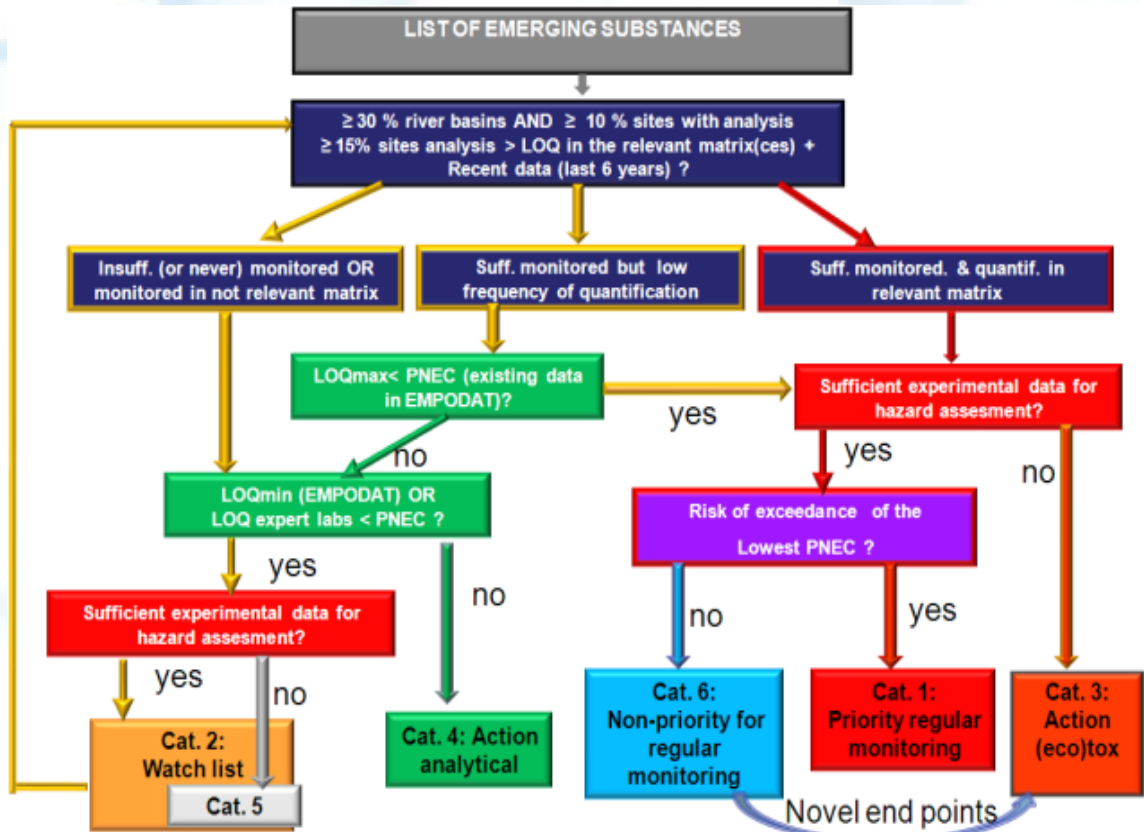
NEW: Add to NORMAN List

- **253 compounds :**
 - 67 flame ret. (used as alternatives to banned products)
 - 10 PPP most frequently detected, highest conc. or chronic EQS exceeded in recent studies
 - **118 PPP/biocides & biocides in use or under review**
 - 50 PFASs in use
 - 8 Pharmas, etc.

New NORMAN prioritisation list: 860 substances



NORMAN Prioritisation scheme for emerging substances
 (V. Dulio & P.C. von der Ohe, 2013, ISBN : 978-2-9545254-0-2)



- **Prioritisation by action categories (on the basis of identified knowledge gaps)**
- **Ranking within each category based on Occurrence + Hazard + Risk**

Action categories

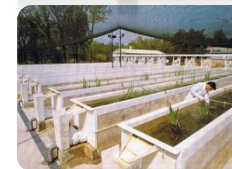
1. Control / mitigation measures



2. Screening campaigns



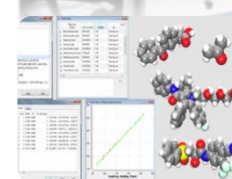
3. Rigorous hazard assessment



4. Improvement of analytical methods



5. Screening AND hazard assessment

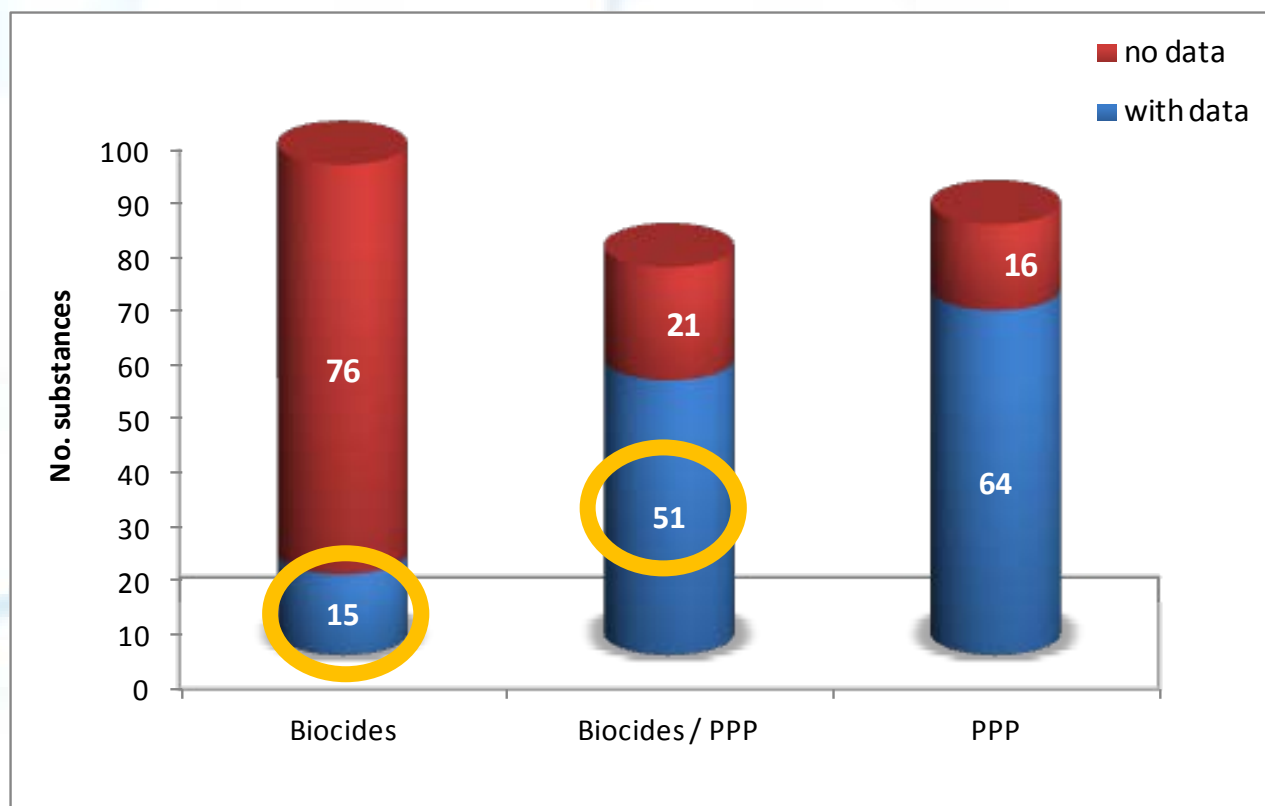


6. Reduced monitoring efforts



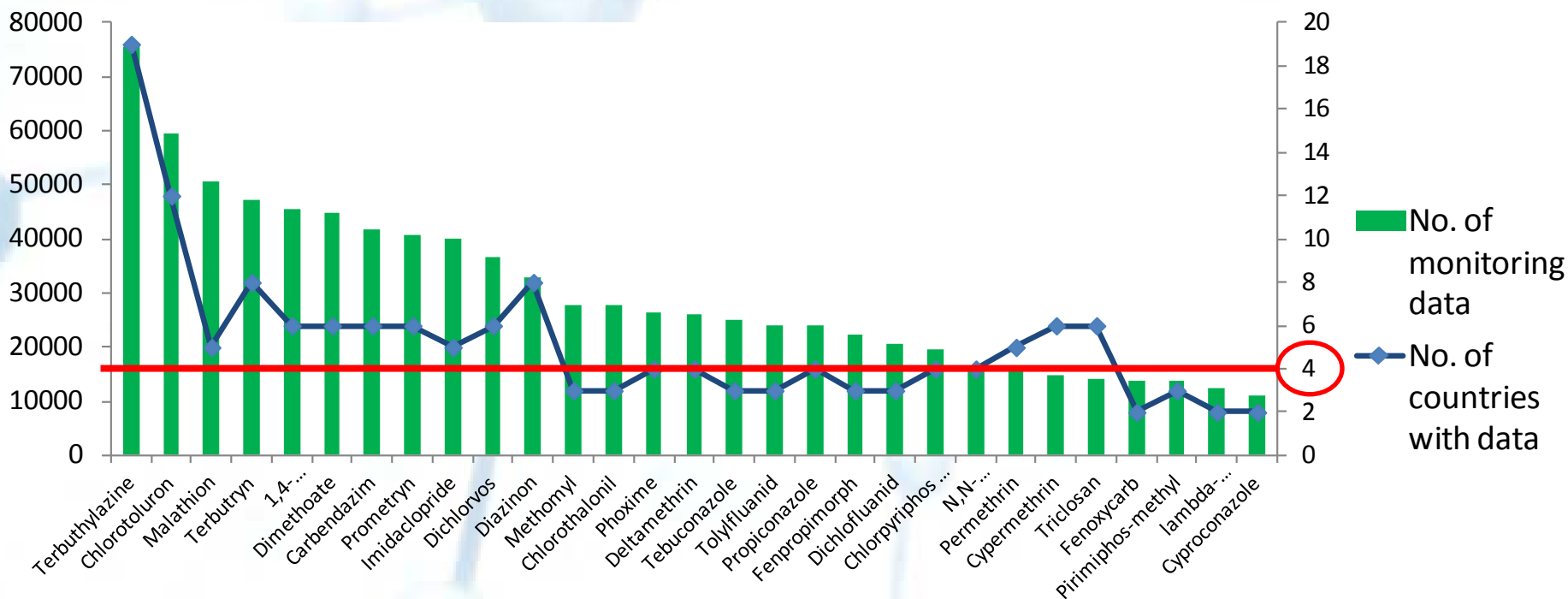
Monitoring data for biocides

- Very few biocides (~ 15%) are part of monitoring programmes
- Mainly substances used also as PPP are monitored today



66 biocides prioritised by NORMAN-WG1

Monitoring data in EMPODAT

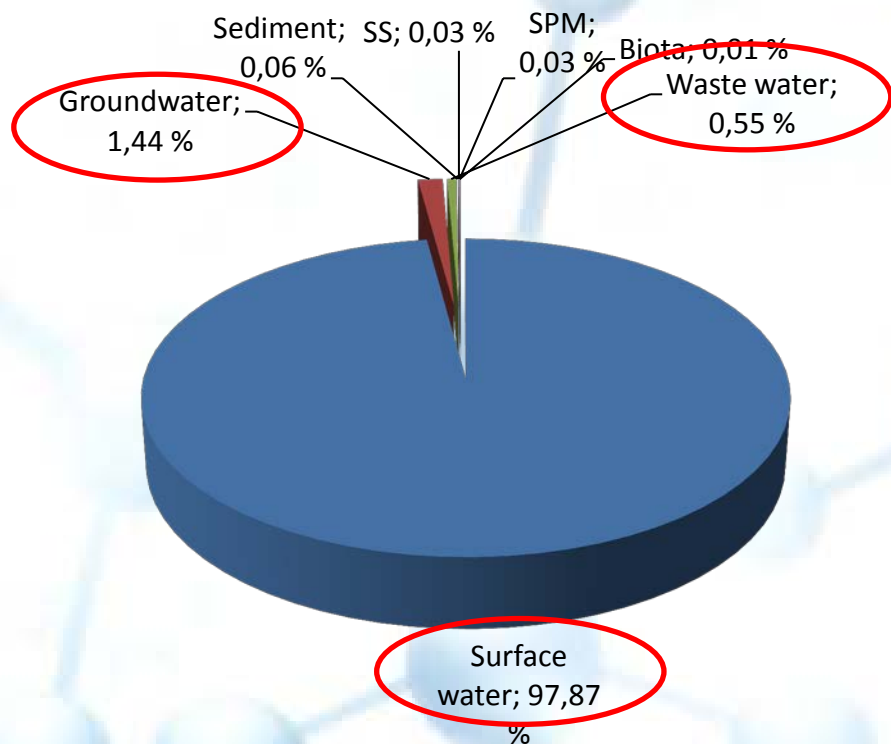


**66 biocides with data: 29 with > 10,000 records
 BUT only 21 can be considered as sufficiently
 monitored (i.e. at least 4 countries with data)**

Monitoring data in EMPODAT

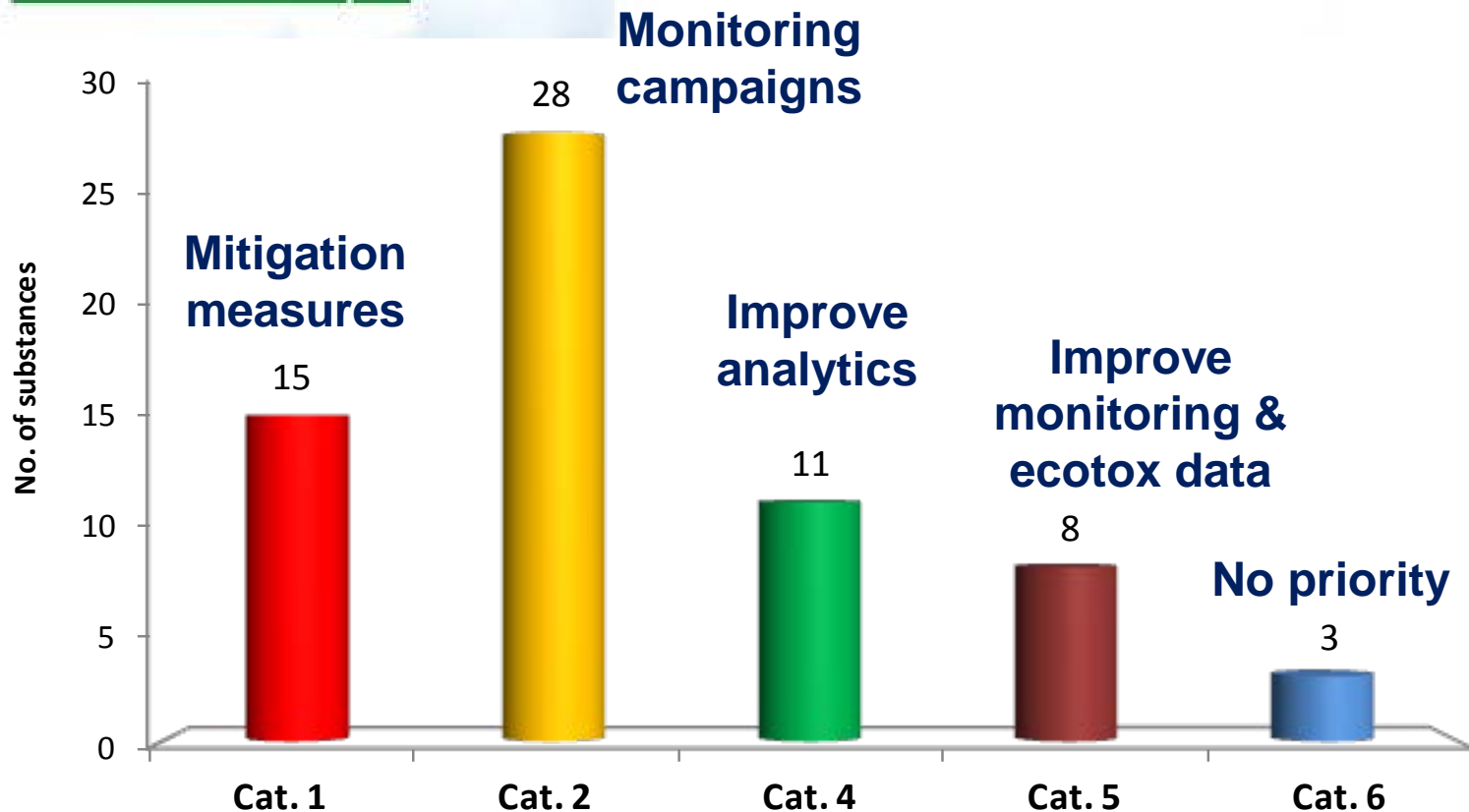
- Distribution of data by ecosystem / matrix (all substances)
- Biocides/PPP distribution by matrix/ compartment

Distribution of data by ecosystem / matrix



	# of biocides	# of data
Surface water	63	968185
Sediment	31	14242
Groundwater	15	5479
Waste water	14	639
SS	10	59
SPM	10	311
Biota	3	293

Results Prioritisation Run



- **Categorisation & Prioritisation of 66 biocides with monitoring data in EMPODAT (2009 – 2013)**
 - **More than 60 % of the biocides on the market are insufficiently monitored in the environment**
(need for monitoring campaigns at EU level, e.g. WFD Watch List)

Prioritisation Results

Sufficient evidence of risk: Mitigation measures

- Deltamethrin *
- Chlorpyrifos methyl **
- Diazinon ***
- Malathion **
- Terbutryn (*)
- Triclosan (*)
- Carbendazim (*)
- Chlorotoluron **
- Terbutylazine **
- Dichlorvos ***
- Prometryn ***
- Imidaclopride *
- Dimethoate **

In use as biocide*

Recently phased-out as biocide
but still in use as PPP**

Banned***

Monitoring needed to assess potential risk

- lambda-Cyhalothrin*
- Cyproconazole*
- Cybutryne (Irgarol) (*)
- Fenpropimorph *
- Tebuconazole *
- Formaldehyde (*)
- Chlorothalonil **
- Tolyfluanid *
- Spinosad *
- Isoproturon (*)
- Thiabendazole *
- Azoxystrobin (*)
- Permetryn *
- Dichlofluanid *

Insufficient analytical performance

- Pirimiphos-methyl **
- Cyfluthrin (*)
- Azamethiphos (*)
- Thiacloprid *
- alpha-Cypermethrin *
- 3-iodo-2-propynyl
butylcarbamate *
- Bendiocarb *
- Bifenthrin *
- Etofenprox *

No priority

- DEET *
- Propiconazole *

Example 1: Permethryn

No. of countries with data	5
No. of sites with data	1292
No. of sites > LOQ	4
No. of analysis	15531
No. of analysis > LOQ	12
Lowest PNEC	0,000094 µg/L
LOQmin	0,005 µg/L
LOQ90	0,06 µg/L

- Approved as Biocide (Wood preservative & Insecticides, acaricides); banned as PPP since 2000
- **Sufficiently** investigated AND **low frequency** of quantification
- **BUT** need to improve the analytical performance => **LOQ > PNEC !**

Further monitoring is needed with appropriate analytical performance

Similar situation for **Cyflutrin, Bifenthrin**

Example 2: DEET (N,N-Diethyltoluamide)

No. of countries with data	4
No. of sites with data	842
No. of sites > LOQ	552
No. of analysis	15319
No. of analysis > LOQ	9740
Lowest PNEC	41 µg/L
MEC95	0,24 µg/L
MEC95 / Lowest PNEC	0,005

- Approved as biocide (PT 19 - Repellent and attractant)
- High frequency of quantification (64% measurements)
- But no risk of exceedance of the Lowest PNEC is identified in water

Not a priority biocide for water monitoring

Conclusions

- Biocides can be regarded as **substances of emerging concern**
- They are still / often **insufficiently** monitored
- A large majority of the available monitoring data is still limited to the **water matrix**
- **NORMAN EMPODAT** offers access to the latest information on emerging pollutants, with an overview of **benchmark values** on their occurrence **across Europe => useful for risk assessors**
- More **active collaboration** of the member states in **monitoring data sharing** is needed for effective risk evaluation

Thank you for your attention



NORMAN-Network : already 10 years