Key challenges in water protection

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Sachverständigenrat für Umweltfragen

Structure and Mandate

Scientific Policy Advice to the Federal Government since 1971

- Independent, scientific Council nominated by Federal Cabinet
- 7 University Professors (Natural Sciences, Engineering, Economics, Law, Political Sciences)
- Broad mandate: Early warning on negative trends, new ideas for environmental policy, inform the wider public
- Active member of EEAC

SRU

Water Framework Directive (WFD)

sets the ambitious goal

of attaining "**good status**" for Europe's

rivers, lakes, groundwater bodies and coastal waters

by **2015**

Marine Strategy Framework Directive (MSFD)

sets the ambitious goal

of attaining "**good environmental status**" for Europe's marine waters

by **2020**

Water Framework Directive (WFD)

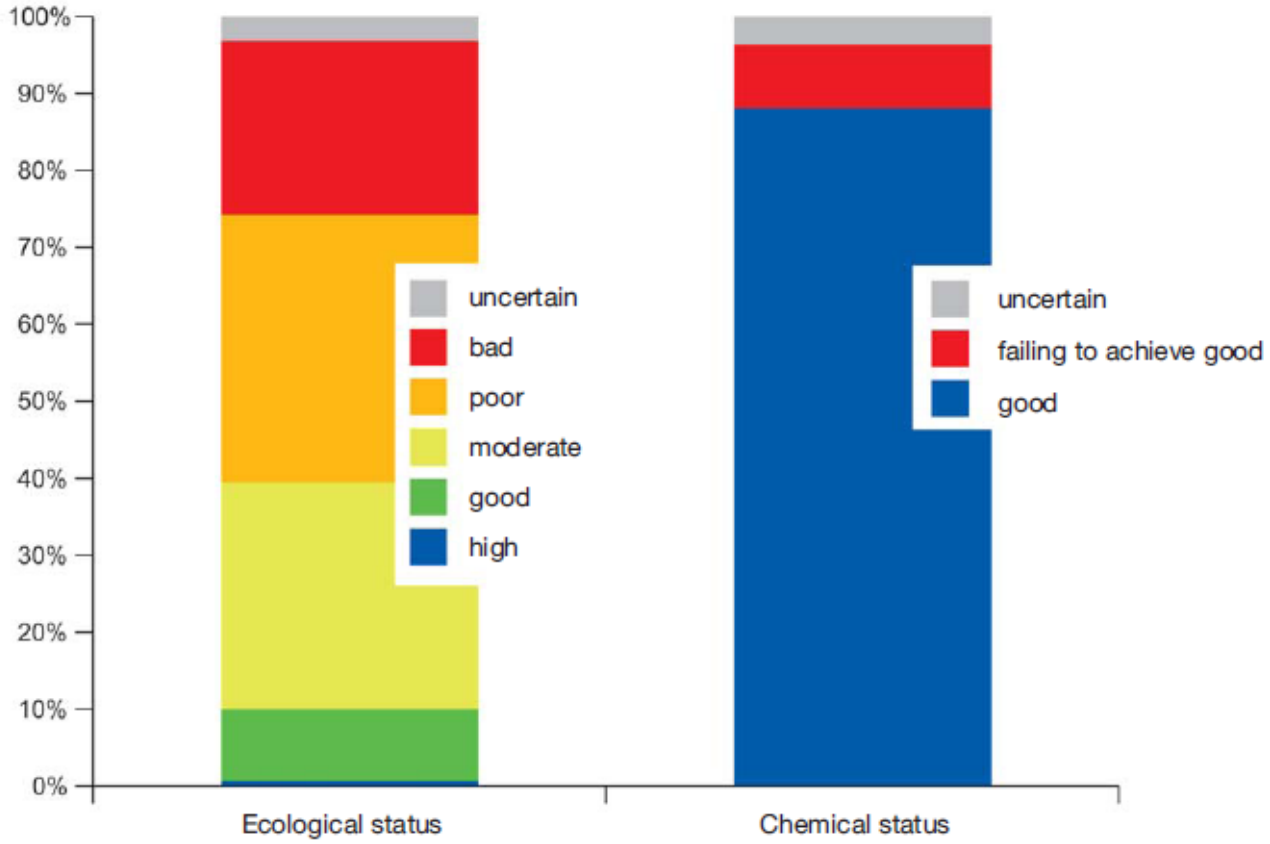
Dec. 2027	Final deadline for achiving WFD objectives
Dec. 2021	Beginning of 3. river basin management period
Dec. 2015	Environmetal objectives achived. 2. management period.
Dec. 2012	**Implementation of relevant measures**
Dec. 2009	Establishment of river basin management plans
Dec. 2006	Monitoring Programmes
Dec. 2004	Characterization of the status of water bodies
Dec. 2000	Effective date of the WFD

Marine Strategy Framework Directive (MSFD)

2020	Deadline for achiving MSFD objectives
2016	Implementation of programmes of measures
2015	Development of programmes of measures
July 2014	Implementation of monitoring programme
July 2012	**Assessement of environmental status, determination of good environmental status, establishment of environmental targets**
2008	Effective date of the MSFD

Water Framework Directive (WFD)

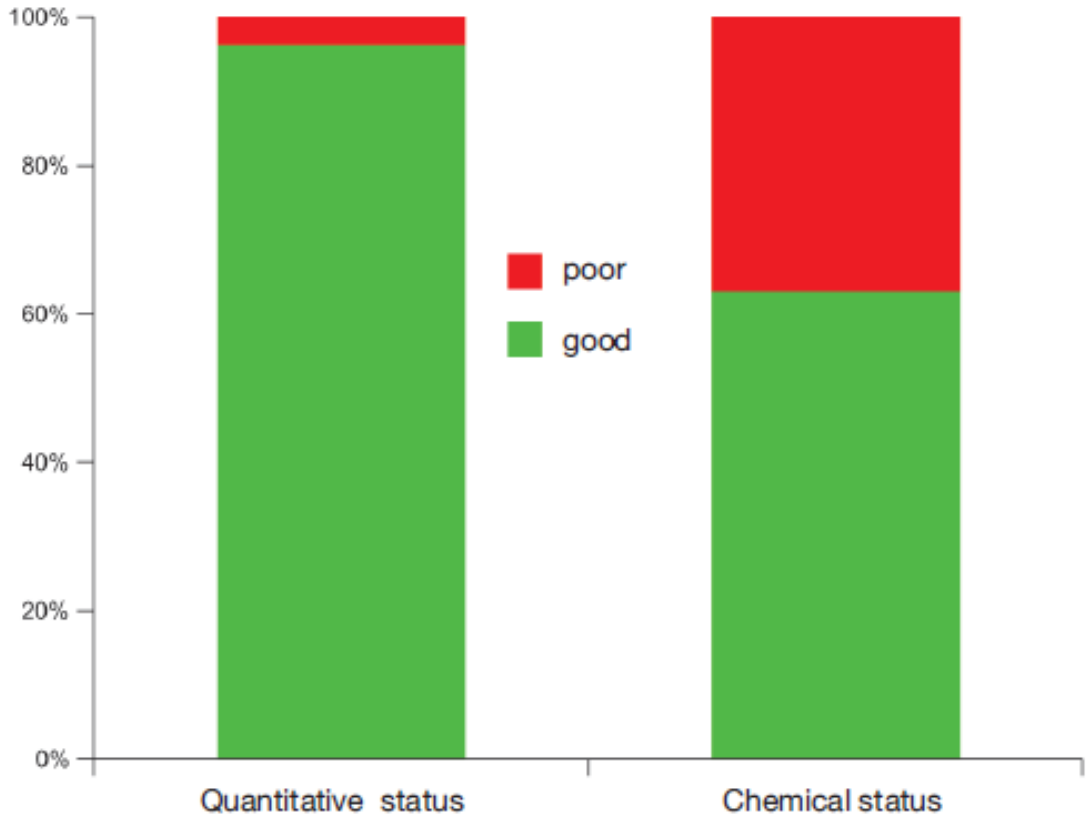
Figure 2: Ecological and chemical status of surface water bodies in Germany.
Data source: Portal WasserBLIcK/BfG, as at 22 March 2010.



BMU, 2010, The water framework directive

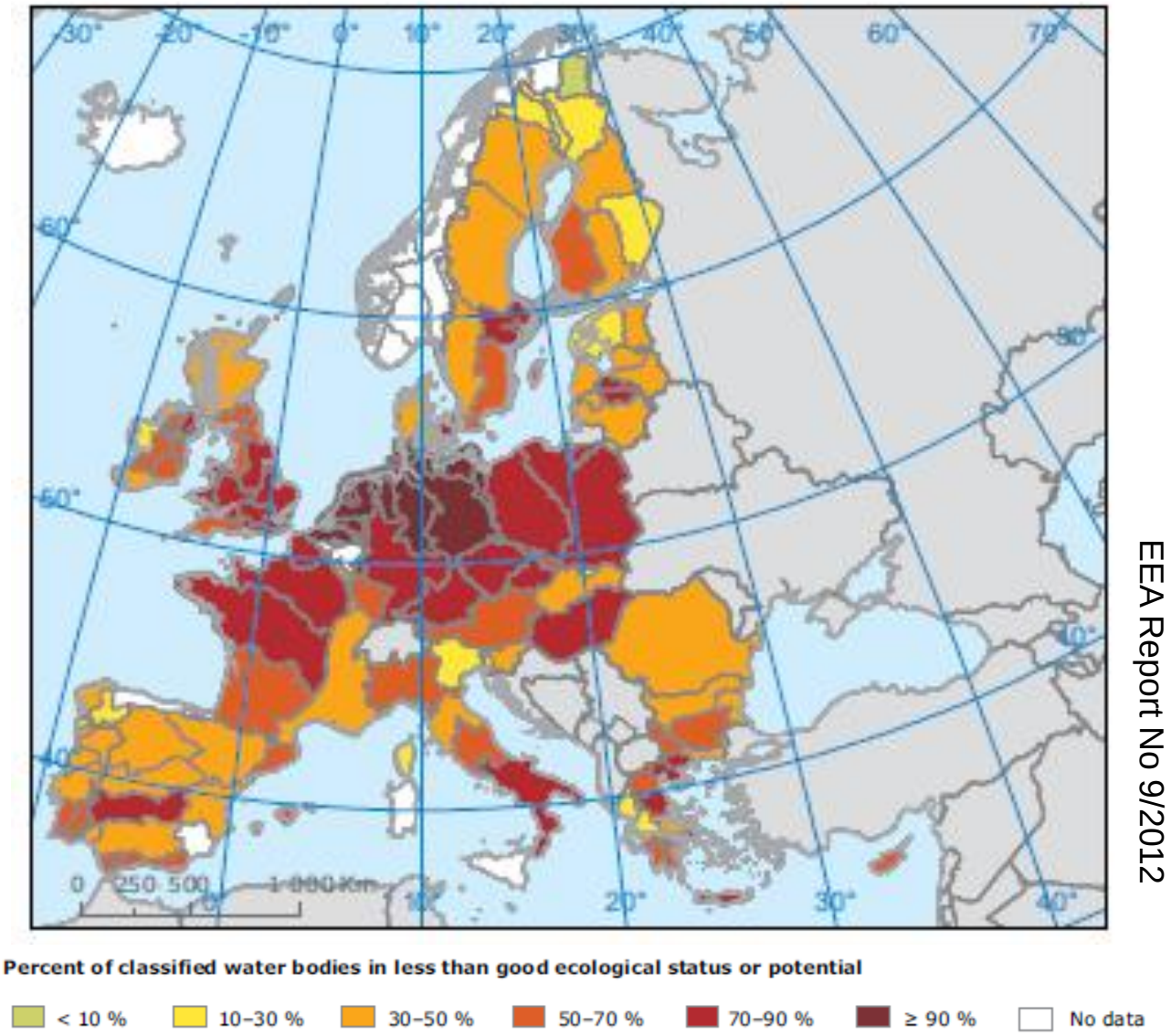
Water Framework Directive (WFD)

Figure 3: Quantitative and chemical status of groundwater bodies in Germany.
Data source: Portal WasserBLIcK/BfG, as at 22 March 2010



BMU, 2010, The water framework directive

Proportion of classified rivers and lakes in different RBDs holding less than good ecological status or potential



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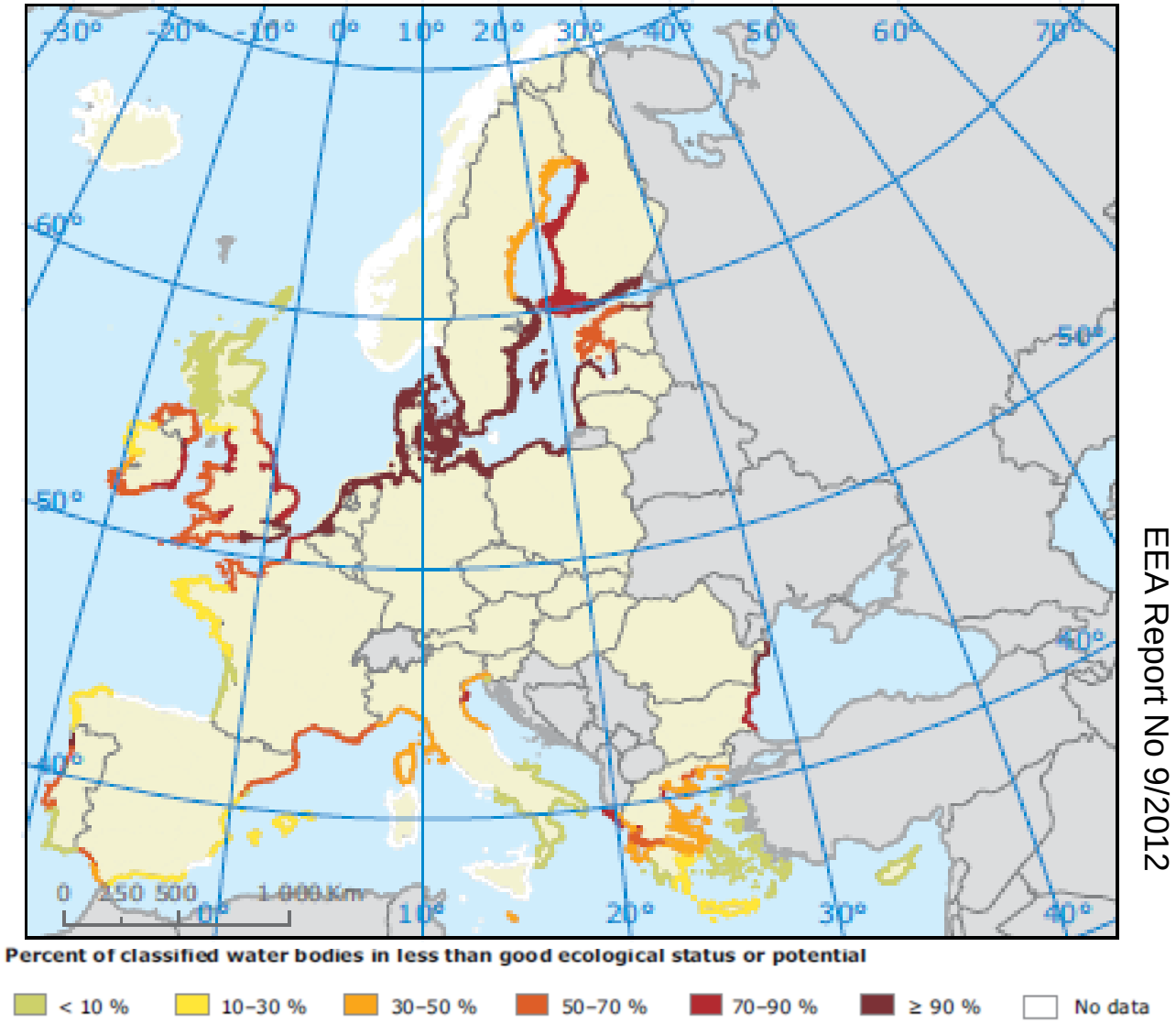
Proportion of classified transitional and coastal waters in different RBDs holding less than good ecological status or potential



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3 key problems preventing surface waters from achiving good ecological and chemical status :

- Hydromorphological pressures altering the structure of aquatic habitats
- Nutrition inputs
- Chemical pollution

1. Hydromorphological pressures

Affecting 40 % of river and transitional water bodies and 30 % of lake water bodies in Europe

Surface waters are morphologically modified coming from different kind of human activities, such as:

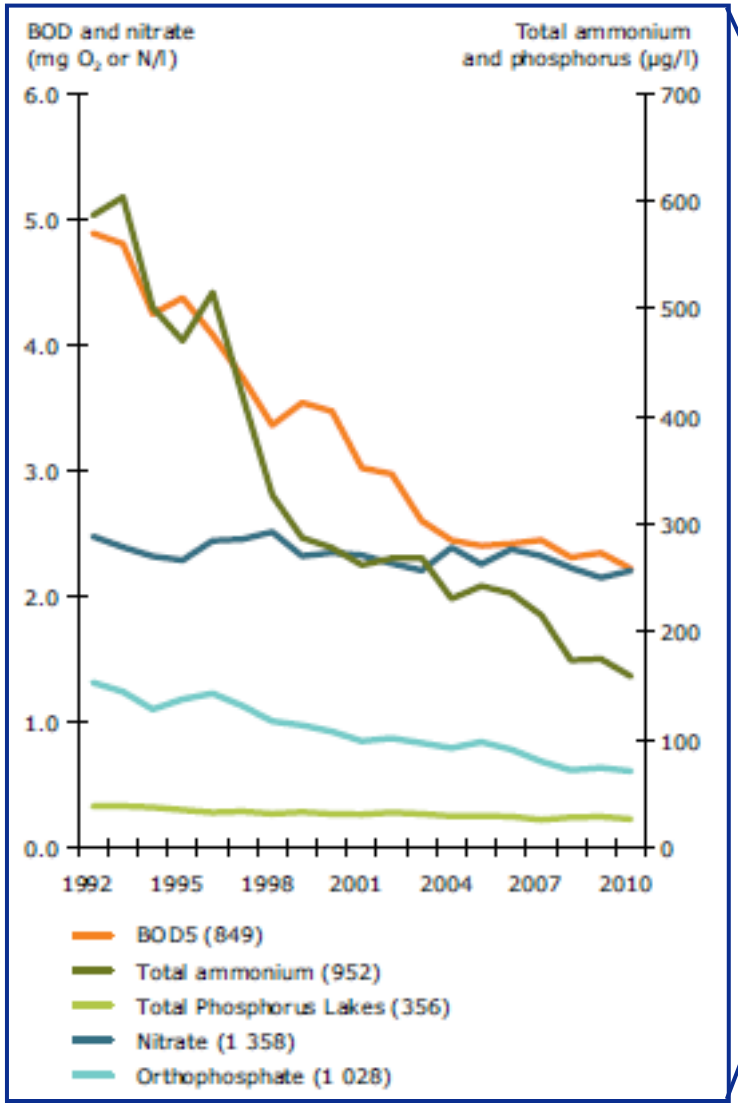
- flood defence,
- regional and urban development,
- navigation,
- or water storage in the form of reservoirs.

These affects the provision of ecosystem services such as:

- water retention and filtering,
- spawning grounds for fish,
- habitats that foster a rich biodiversity,
- changes in bed and bank characteristics.

2. Nutrition inputs

Changes in water quality variables during the last two decades



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Nitrogen inputs from the use of fertilizers remains a huge problem

3. Chemical Pollutions (chemical status)

Ground Water Bodies: high levels of nitrate concentrations (again mainly from agriculture)

Surface Waters (less then 10% of European water bodies are in a poor chemical status):

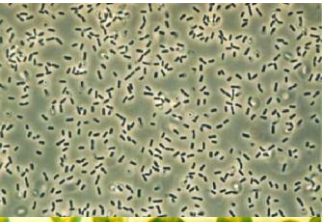
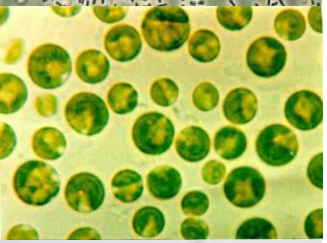
- Polycyclic aromatic hydrocarbons (PAHs) – (byproduct of fuel burning)
- Heavy metals (e.g. high concentrations in sediments)
- Industrial chemicals like pesticides and plasticiser

A variety of pollutants groups are responsible for poor chemical status in coastal waters (one example tributyltin =TBT)

Chemical Pollutions (chemical status)

New and largely unknown groups of substances

- endocrine disrupters (wide range of substances)
- medical products
- plasticiser (Bis(2-ethylhexyl) phthalate = DEHP) or brominated flame retardants (BFR)
- engineered nanomaterials

Endocrine disrupters

Wide range of substances that have the potential to effect the endocrine system of animals and human beings.

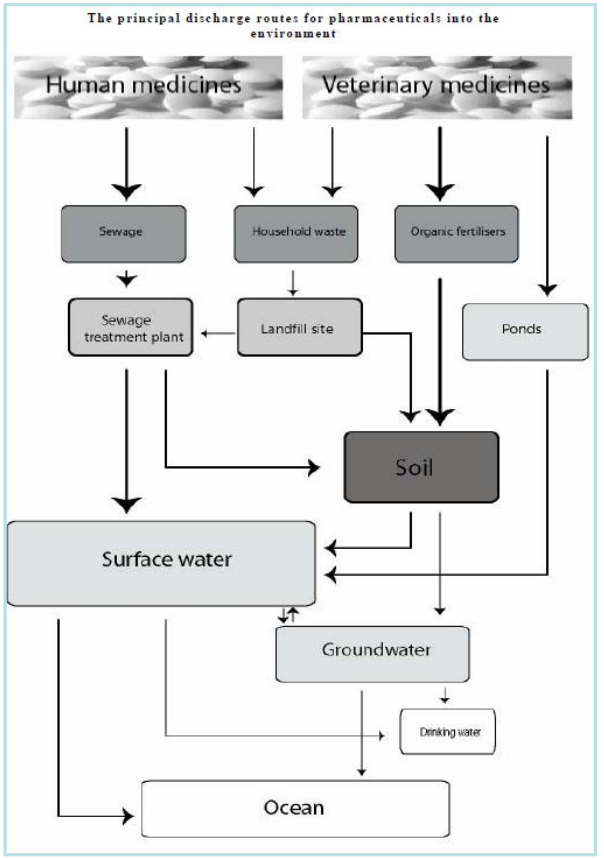
- natural hormons (17β-estradiol)
- pharmaceuticals (17α-ethinyloestradiol)
- pesticides (DDT)
- other industrial chemicals such as: PCBs, plasticiser (Phthalate), brominated flame retardants (BFR), bisphenol A

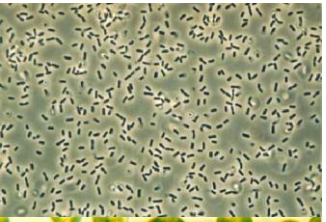
pharmaceuticals

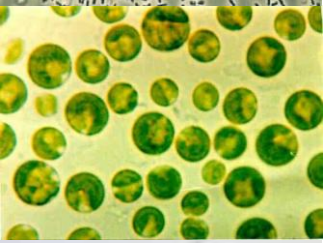
Examples: diclofenac, carbamazepine, 17α-ethinyloestradiol, antibiotics

- active ingredients
- high solubility
- some of them are persistent and highly mobile
- some of them are moderately or poor eliminated in sewage treatment plants

The environmental concentrations can increase in the future due to demographic changes



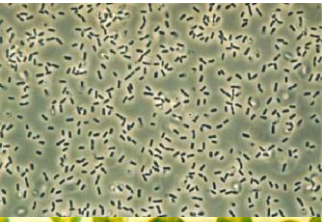


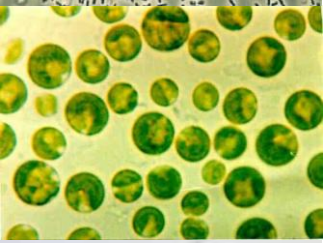


Plasticisers, flame retardants, bisphenol A, perfluorinated tensides (PFTs) ….

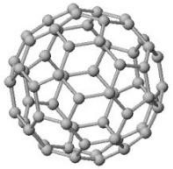
- high volume chemical substances
- used in a wide range of daily products
- very persistent
- occur ubiquitously
- no or nearly no acut toxicity
- but there are indications for a chronic toxicity

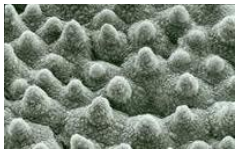
engineered nanomaterials

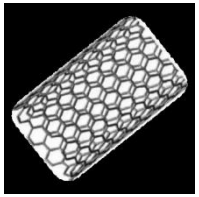




- size of material between 1 and 100 nm
- new properties due to their size
- a huge number of possible nanomaterials (different substances, different size, different coating)
- used in an increasing number of daily products
- they are often very persistent
- there are indications for a different mobility then the macro counterpart
- but first investigations shows that they are eliminated to a great extent in sewage treatment plants







Thank you very much for your attention

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