Water quality policy in a European context

Looking for the right tools to protect aquatic ecosystems

Els Smit
RIVM – Centre for Safety of Substances and Products
RIVM – committed to health and sustainability

- independent government institute

- knowledge partner and advisor for Dutch ministries, inspectorates, local/regional authorities, international organisations

- health and environment
  - Infectious disease control (e.g., coordination, diagnostics, prevention and control)
  - Public health and health services (e.g., nutrition, societal health)
  - Environment and Safety (e.g., environmental and chemical safety, sustainability, monitoring)
RIVM: chemicals and water quality

- emissions, fate and behaviour of substances
- human and environmental effects assessment
- various legal and policy frameworks
  - industrial chemicals: national competent authority REACH
  - plant protection products and biocides
  - pharmaceuticals
  - nutriënts
  - nanoparticles and microplastics
- technical scientific policy advice
- (desk) research into emissions, fate, effects; nutrient monitoring
- risk assessment, tailor-made advice
  - calamities; location specific RA; permitting
Aims of the Water Framework Directive

● maintaining and improving the aquatic environment in the EU
  – quality and quantity
  – surface waters, groundwater, drinking water
● emission reduction for hazardous substances
● elimination of priority hazardous compounds

This Directive aims at maintaining and improving the aquatic environment in the Community. This purpose is primarily concerned with the quality of the waters concerned. Control of quantity is an ancillary element in securing good water quality and therefore measures on quantity, serving the objective of ensuring good quality, should also be established.

Good water quality will contribute to securing the drinking water supply for the population.

The quantitative status of a body of groundwater may have an impact on the ecological quality of surface waters and terrestrial ecosystems associated with that groundwater body.

Member States should aim to achieve the objective of at least good water status by defining and implementing the necessary measures within integrated programmes of measures, taking into account existing Community requirements. Where good water status already exists, it should be maintained. For groundwater, in addition to the requirements of good status, any significant and sustained upward trend in the concentration of any pollutant should be identified and reversed.
6-years planning cycle

measures -> status assessment
status assessment -> analysis of sources
analysis of sources -> measures
Chemical status: EU level

- EU Directive: union wide problematic substances with legally binding quality standards
- Priority and priority hazardous (PHS = CMR, PBT, ED)
- Standards have to be met in 2015, 2021 or 2027
Ecological status: national

- biology, hydromorphology, physico-chemistry
- chemistry: $\approx 70$ specific pollutants
Chemical and ecological status assessment

- one out all out: single substance overrules all other parameters
Measures

- habitat improvement
- emission control
- ‘chain approach’ medicines
Some considerations on the WFD ....
Selection of chemicals?

● bias towards old substances
  - focus on long term, high quality monitoring data
  - one-out-all-out: no incentive for addition of new compounds

● substance by substance approach
  - 500 approved PPP in EU
  - 2000 pharmaceuticals
  - 15809 industrial chemicals in REACH

● REACH: 170 candidate SVHC, 42 authorisations
● WFD EU priority list: <50 compounds, no pharmaceuticals, no neonicotinoids
## Interaction with other chemical legislation?

### LIST OF PRIORITY SUBSTANCES IN THE FIELD OF WATER POLICY

<table>
<thead>
<tr>
<th>Number</th>
<th>CAS number ((^1))</th>
<th>EU number ((^2))</th>
<th>Name of priority substance ((^3))</th>
<th>Identified as priority hazardous substance</th>
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<td>(9)</td>
<td>2921-88-2</td>
<td>220-864-4</td>
<td>Chlorpyrifos (Chlorpyrifos-ethyl)</td>
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<td>(11)</td>
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<td>200-838-9</td>
<td>Dichloromethane</td>
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<table>
<thead>
<tr>
<th>Legislation</th>
<th>Classification Reg. 1272/2008</th>
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<tr>
<td>05/72/EC , Reg. (EU) No 540/2011</td>
<td>Acute Tox. 3 - H301</td>
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<td>Aquatic Chronic 1 - H410</td>
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**Date of approval** 01/07/2006, **Expiration of approval** 31/01/2018

**RMS** ES, **Risk** Commission

**Toxicological information**

<table>
<thead>
<tr>
<th>Reference values</th>
<th>Source</th>
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Ecological simplicity in quality standards?
Emerging compounds, new effects?

REPORT

Dilute Concentrations of a Psychiatric Drug Alter Behavior of Fish from Natural Populations

T. Brodin, J. Fick, M. Jonsson, J. Klaminder

To whom correspondence should be addressed. E-mail: tomas.brodin@emg.umu.se

Unexpected effects of sublethal doses of insecticide on the peripheral olfactory response and sexual behavior in a pest insect

Lisa Lalouette, Marie-Anne Pottier, Marie-Anne Wycke, Constance Boitard, Françoise Bozzolan, Annick Maria, Elodie Demonidion, Thomas Chertemps, Philippe Lucas and 3 more
Some ideas (from various sources ...)

Towards the review of the European Union Water Framework Directive: Recommendations for more efficient assessment and management of chemical contamination in European surface water resources

Werner Brack, Valeria Dulio, Marlene Ågerstrand, Ian Allan, Rolf Altenburger, Markus Brinkmann, L. Mark Hewitt, Claudia Lindim, Q. Heinz Rüdel, Jos van Gils, H. Brink, Jos van Gils, J. de Jonge, E. Leth, E. van Roek, C. Stoll and P. M. van Vel

Aquatic effect assessment for plant protection products

Dutch proposal that addresses the requirements of the Plant Protection Product Regulation and Water Framework Directive

T.C.M. Brack, G. J.P. Arts, T.M. ten Hulscher, F.M.W. de Jonge, E. Leth, E. van Roek, C. Stoll and P. M. van Vel
Reward monitoring and assessment

Figure 1: Percentage of surface water bodies at risk of failing WFD objectives per Member State - ■ = 'at risk', ▲ = 'insufficient data', ▼ = 'not at risk' (based on Member States' reports)
Connect legislation

- WFD assessment should be feedback for approval
- Improve prospective risk assessment e.g., include WFD targets in fate modelling
- Access to dossier data
Use non-standard species and endpoints in QS

Short Communication

THE NEONICOTINOID IMIDACLOPRID SHOWS HIGH CHRONIC TOXICITY TO MAYFLY NYMPHS

IVO ROESSINK,† LEMESSA B. MERGA,‡ HANS J. ZWEERS,† and PAUL J. VAN DEN BRINK*†‡
†Alterra, Wageningen University and Research Centre, Wageningen, The Netherlands
‡Department of Aquatic Ecology and Water Quality Management, Wageningen University, Wageningen, The Netherlands
Systems approach

- nutrients, light
- habitat, dispersal
- organic input
- toxicity
- foreseen function
Use innovations in monitoring

- chemical, ecological, integrative
Benefits – needs for successful implementation

- increased efficiency
  - same information at lower costs
    - passive sampling vs fish biomonitoring
  - more/better information at similar costs
    - fish eDNA: yearly vs every 6th year
    - other species than in traditional sampling
    - other parameters: functional effects
    - other chemicals: emerging risks

- link between chemical and ecological assessment
  - better understanding of systems
  - input for improvement of standard derivation
Benefits – needs for successful implementation

● European and national acceptance, harmonization
● link with existing methods/frameworks
  – trend analysis
  – prospective risk assessment (REACH, PPP, biocides)

● one solution fits all purposes?
  – early warning
  – detection/control of emissions
  – evaluation of measures
  – status reporting obligations ➔ regulatory triggers, assessment schemes

● WFD is more than ecology ... human exposure (drinking water, fish consumption) should not be forgotten

ACTIVITY: EFFECT-BASED TOOLS/METHODS
for WG Chemicals as part of the Water Framework Directive CIS Work Programme (2016-2018) endorsed by the Water Directors

“Effect-based assays; links between chemical and ecological status; mixtures. Possible follow-up of estrogen-screening project. Exchange of information on innovative techniques, approaches and potential application in WFD context”
Water status is slowly improving

2009: 43% of EU surface waters will have good ecological status by 2015.

2015: 53% of EU surface waters will have good ecological status by 2015.

100%