SETAC Europe 21st Annual Meeting

Ecosystem Protection in a Sustainable World: a Challenge for Science and Regulation

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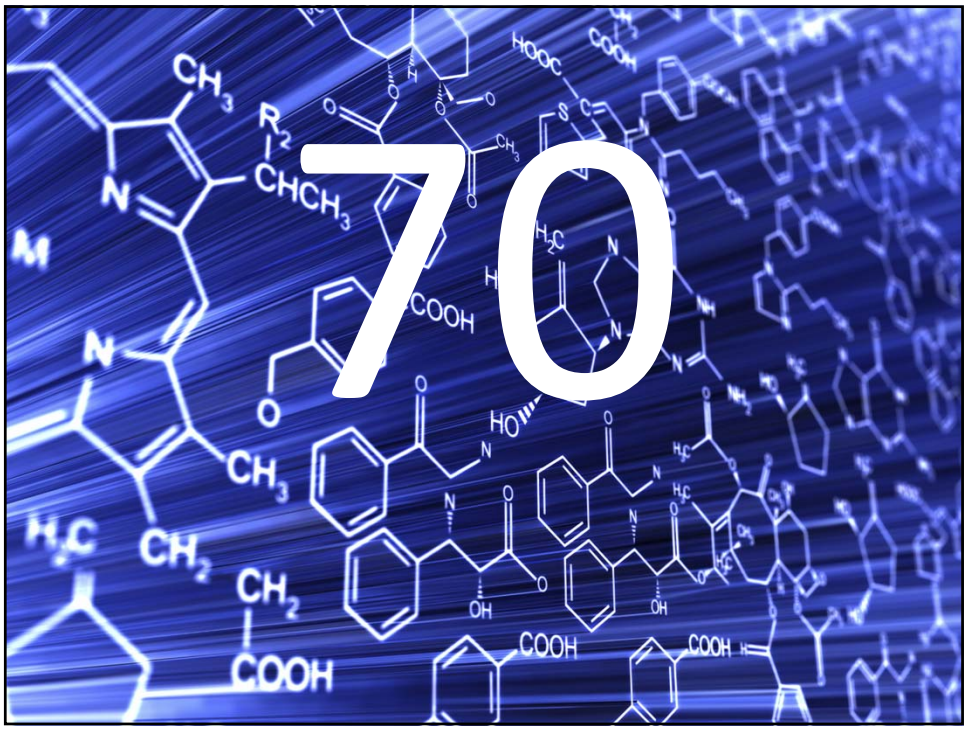
Risk Assessment

–

a summary (sort of)

Thomas Backhaus



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70 - the number of new chemicals registered by the American Chemical Society...

...per hour

McKinney et al. (2007): Environmental Science: Systems and Solutions, p. 377

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During the course of SETAC Europe 2011 (Sunday 17:00 – Thursday 15:00)

65 680

new chemicals are born...

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- RA13 – the future of ERA – was the largest, RA session, spanning four slots
- 12 "green" Risk Assessment sessions with a total of 90 presentations in total
- Plus 256 posters
- Plus several special sessions
- Plus a multitude of RA-related presentations in other sessions

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Issues and Challenges

- New regulatory developments (e.g. Biocide regulation)
- New regulatory concepts (e.g. hazard based assessment (PBT, CMR))
- New instruments, demands and approaches (e.g. requests for data sharing)
- New scientific concepts (e.g. ecosystem services, trait-based approaches)
- Recent political developments (e.g. EU Council Conclusion on Combination Effects)

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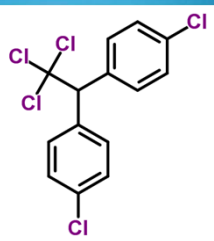
A global perspective

Example: antifoulants

Europe: self-cleaning robots

China: **DDT**



From Kurt Haglund, Kevin Long, Special Session 03

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- China's fishing fleet is 300-400,000 vessels
- DDT is the substance of choice for antifouling
  - Cheap
  - Can be added to normal paint and applied
  - Effective for one season
- 150-300 MT Released per year

From Kevin Long, Special Session 03

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The conclusions (2)

Name	CAS No.	Persis-tence	Bioaccu-mulation	PNEC (µg/l)
Isothiazolin (unidentified)	873225-68-4	Fail[1]	Fail[1]	ND[4]
2-Octyl-4-isothiazolin-3-one (OIT)	26530-20-1	Fail[1]	Pass	2.0 × 10^{-4}
N-(2,4,6-Trichlophenyl) maleimide (TCPM)	13167-25-4	Fail[2]	Fail[2]	N/A
triphenylborane pyridine (TPBP)	971-66-4	Pass	Fail[3]	2.0 × 10^{-4}
Zinc 2-pyridinethiol-1-oxide (ZnP)	13463-41-7	Pass	Pass	7.0 × 10^{-2}
Zinc ethylene(bis)dithiocarbamate (Zineb)	12122-67-7	Pass	Pass	3.6 × 10^{-2}

1. Insufficient data available for review – precautionary fail
2. Available data indicated this to be a DDT metabolite, with widespread measurements reported in body tissue of several different marine mammals, therefore no further steps were taken to include this molecule in the process
3. Based upon an estimate of Log10KOW by EPIWIN QSAR. It is noted that this QSAR is not suitable for ion-paired substances such as TPBP, but in the absence of measured data a precautionary approach is proposed

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Models vs. Reality

In God we trust. All others must bring data.

Robert Hayden, Plymouth State College

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More examples

- R. Fox "SSDs – good idea, bad practice" (RA13B-1)
- L. Posthuma & D. de Zwart "On correct interpretation of SSD output through eco-epidemiological analyses" (RA13B-6)

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Upcoming groups of compounds

- Pharmaceuticals, especially antibiotics (still...)
- Nanoparticles (now more then ever)
- Transformation products ("the new emerging pollutants")
- Radionuclides

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Challenges Posed by Radiation and Radionuclide Releases to the Environment

- 19 manuscripts
- Current knowledge on environmental fate and effects on aquatic life, wildlife, and agricultural
- Integrated Environmental Assessment and Management, July 2011

2011 SETAC-NA Mtg, Boston

2012 SETAC World Congress, Berlin

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Human vs Ecological Risk Assessment

- HRA is gaining a stronger foothold

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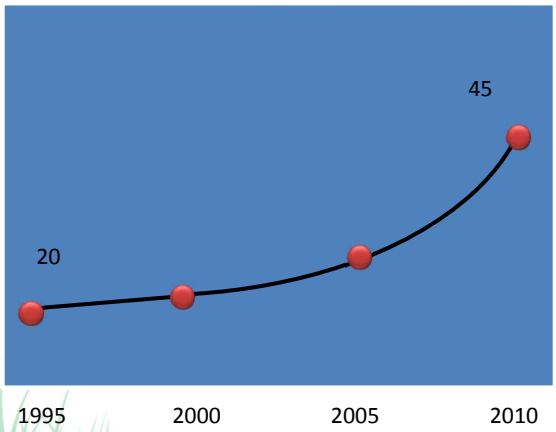
Health Risk Assessment Publications



Papers in ETC and IEAM

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Human vs Ecological Risk Assessment

- HRA is gaining a stronger foothold
- Integration and criticial reflection on endpoints, protection goals, etc.

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An upcoming challenge

- Planetary boundaries
- J. Rockström et al.: "A safe operating space for humanity", *Nature*, 461, 472-475, 2009

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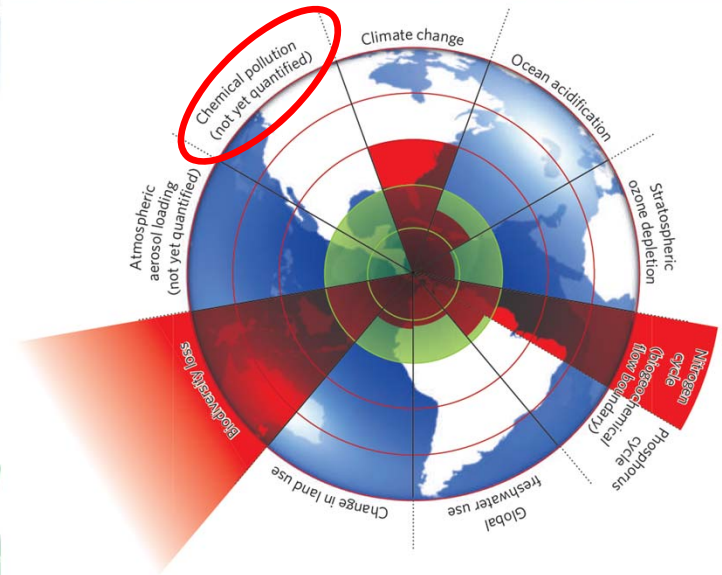

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An upcoming challenge

- Planetary boundaries.
- Their definition might be critical for sustainable chemical use
- We need an unbiased, complete overview of chemical emissions and their impacts.
  - planet-wide distribution of chemicals
  - transformation products
  - biodiversity,
  - ecosystem services
  - cross-cutting regulatory disciplines
  - Mixture effects

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CHALMERS UNIVERSITY OF TECHNOLOGY

Conceptualizing
Emissions of Chemicals from Products
– foundations of a modeling approach

Sverker Molander

Johan Tivander, Filippa Fuhrman
Chalmers University of Technology, Gothenburg, Sweden

Tomas Rydberg
IVL Swedish Environmental Research Institute, Gothenburg, Sweden

Patrik Andersson, Peter Haglund, Tomas Holmgren
Department of Chemistry, Umeå University, Umeå, Sweden

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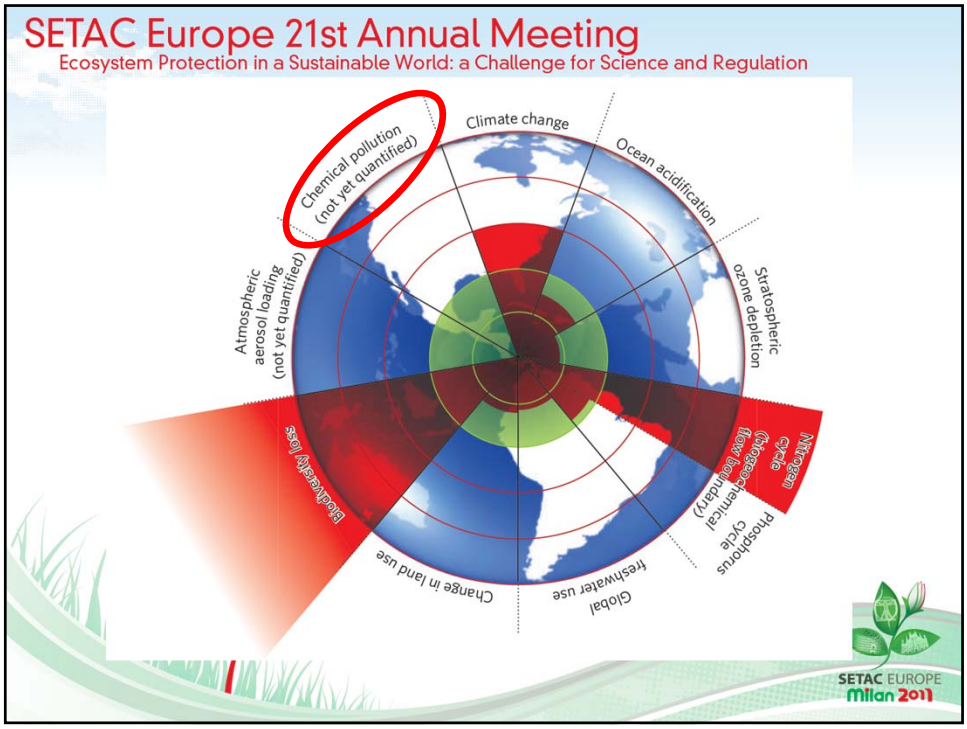
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Climate change
Ocean acidification
Stratospheric ozone depletion
Nitrogen cycle (biogeochemical flow boundary)
Phosphorus cycle
Global freshwater use
Change in land use
Biodiversity loss
Atmospheric aerosol loading (not yet quantified)
Chemical pollution (not yet quantified)
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