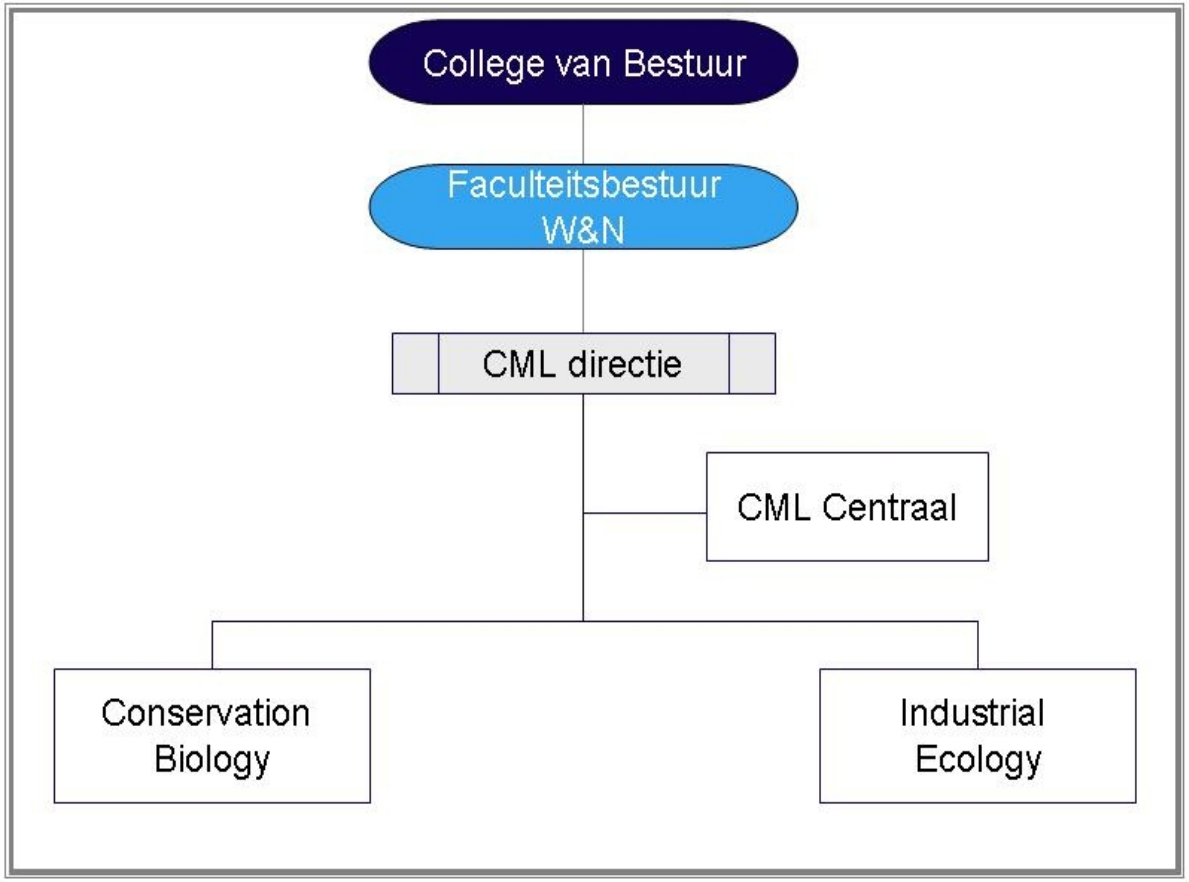
Institute of Environmental Sciences Leiden (CML)

Willie Peijnenburg – 26/10/2009

Organisation CML

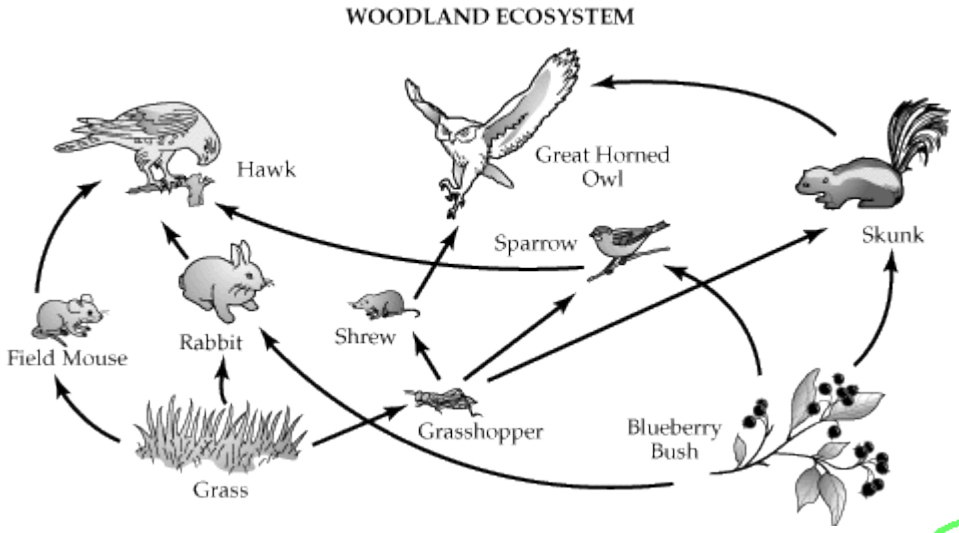


Education CML

- Chemistry
  - Partner Bsc. MST (Molecular Science Technology)
  - Ma Industrial Ecology (UL – TUD) (2009)
- Biology
  - Partner in Bsc. Biology
  - Ma-track Biology: Evolution, Biodiversity & Conservation (IBL, NHN, Naturalis)
- Minor Sustainable Development (2009)

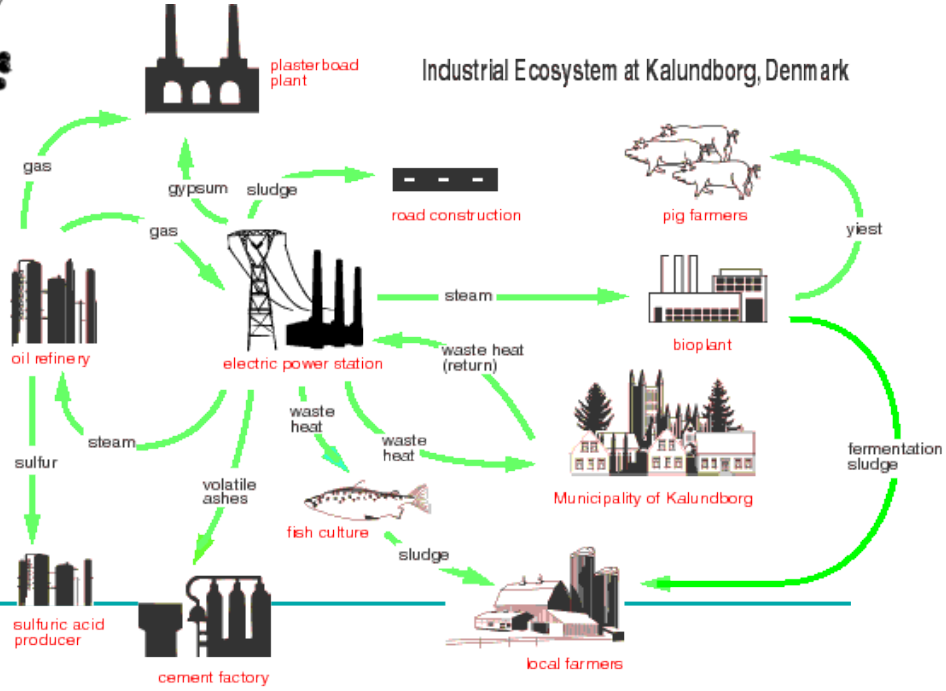
Department Industrial Ecology

Industrial ecology?



A biological ecosystem

An industrial ecosystem



CML-IE research

- Methodology development (world standard)
  - Life-Cycle Analysis (LCA), Material Flow Analysis (MFA)
- Use of scientific tools for analysis of sustainability problems
  - (bio-)energy
  - resources / materials
  - waste (water) treatment, life styles, chlorine industry, metals
- Conceptual research for policy support
  - strategic resource management
  - ecological footprint (carbon footprint, water footprint)

Department Conservation Biology

Biodiversity research Leiden

IBL

Biodiversity
Evolution

CML

Conservation/use
Biodiversity

Naturalis / NHN

Biodiversity
Taxonomy

Conservation Biology research

Research focus: impacts of…

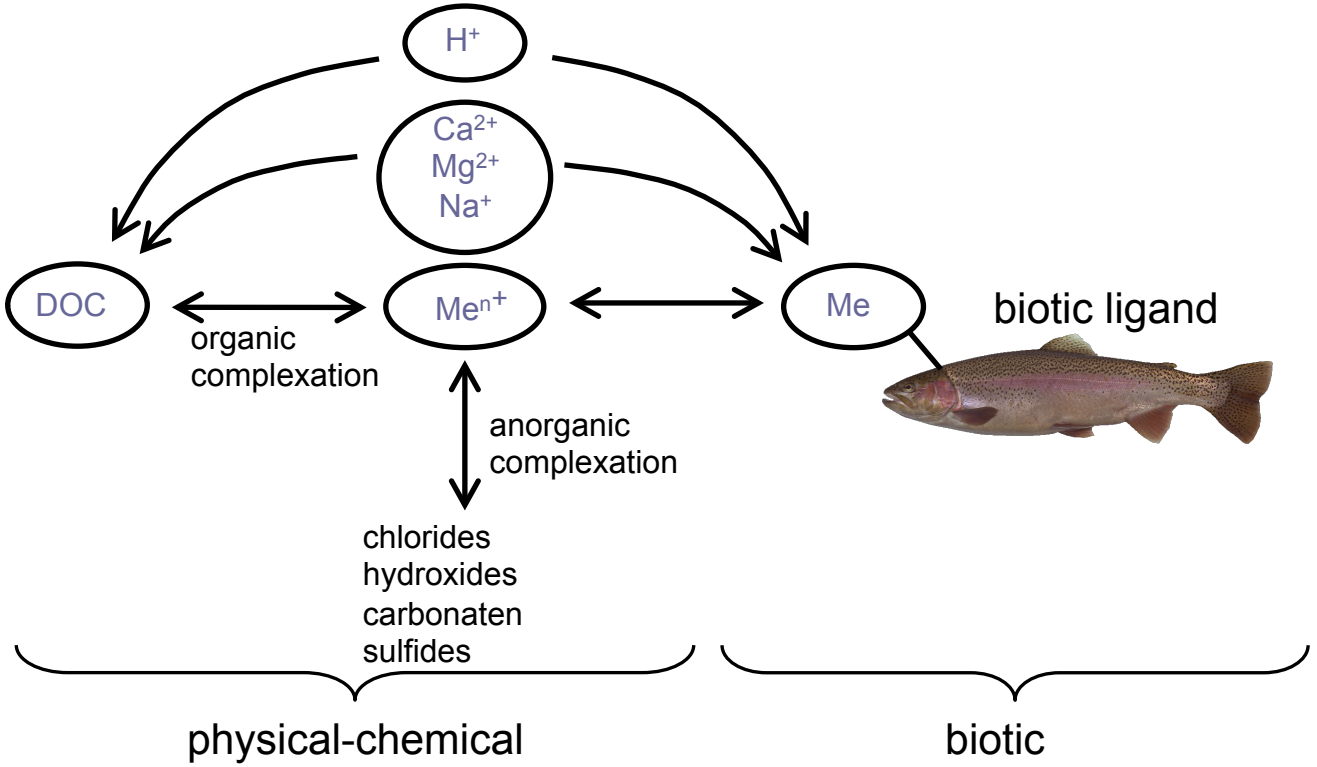
1. Chemical and biotic stress on biodiversity
   - pesticides, metals etc.
   - genes, invasive species

2. Land use changes on biodiversity
   - nature conservation on farmland, extensive land use

Some examples from EU, Philippines (Denyse Snelder) and Cameroon
Indonesia: Hans de Iongh, Gerard Persoon

Environmental problem?

Biotic Ligand Modelling

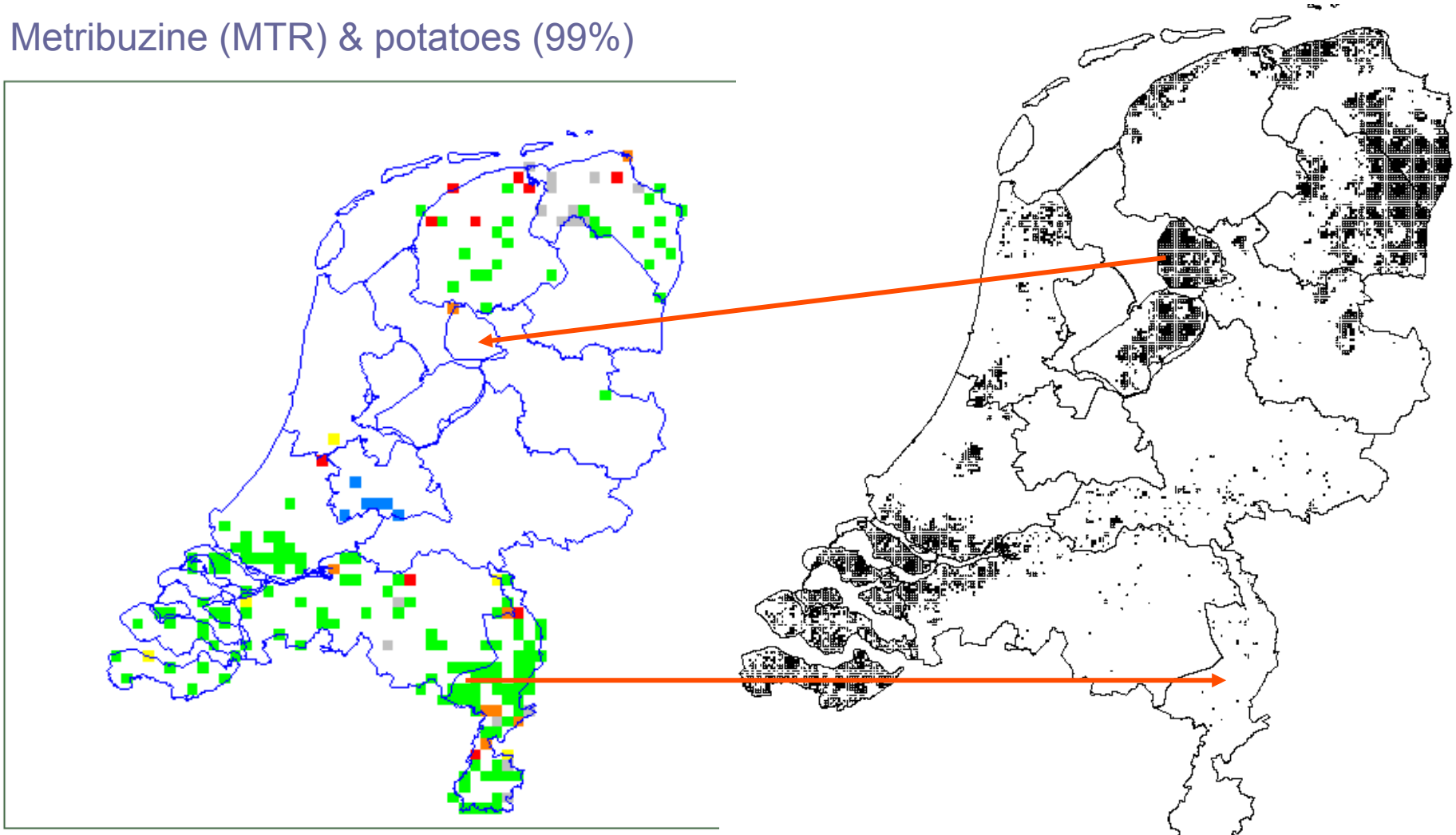


- Metals (Cu, Zn etc.)
- Cooperation RIVM: special chair (09-2009)

Spatial-temporal analysis monitoring data

www.pesticidesatlas.nl (4000 maps)

Metribuzine (MTR) & potatoes (99%)



Impact: validation of models, link land use and biodiversity

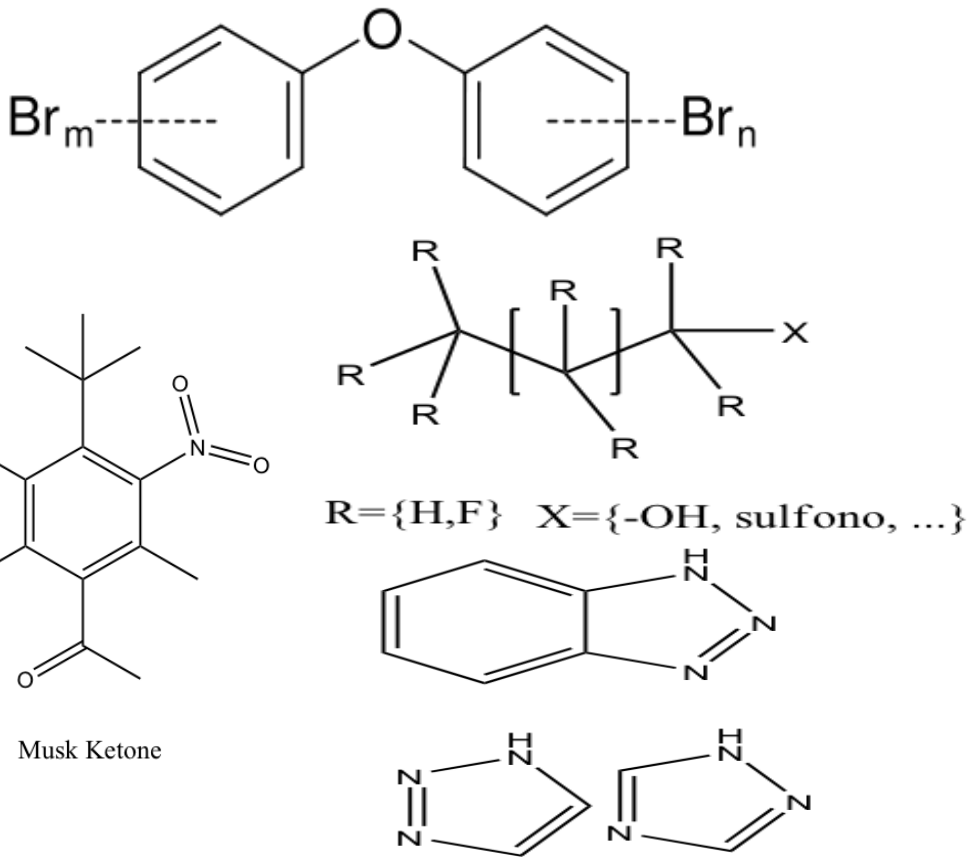
Predictive Toxicity

Case studies on the Development and Application of *in silico* Techniques for Environmental hazard and Risk assessment (CADASTER) – FP7

Goal

Our project will exemplify the integration of information, models and strategies for carrying out safety-, hazard- and risk assessments for large numbers of substances to the new categories of risk assessors within REACH .

We will deliver real risk estimates according to the basic REACH philosophy of minimizing animal testing, time and costs . CADASTER will show how to increase the use of non-testing information for regulatory decision whilst meeting the main challenge of quantifying and reducing the level of uncertainty of predictions.



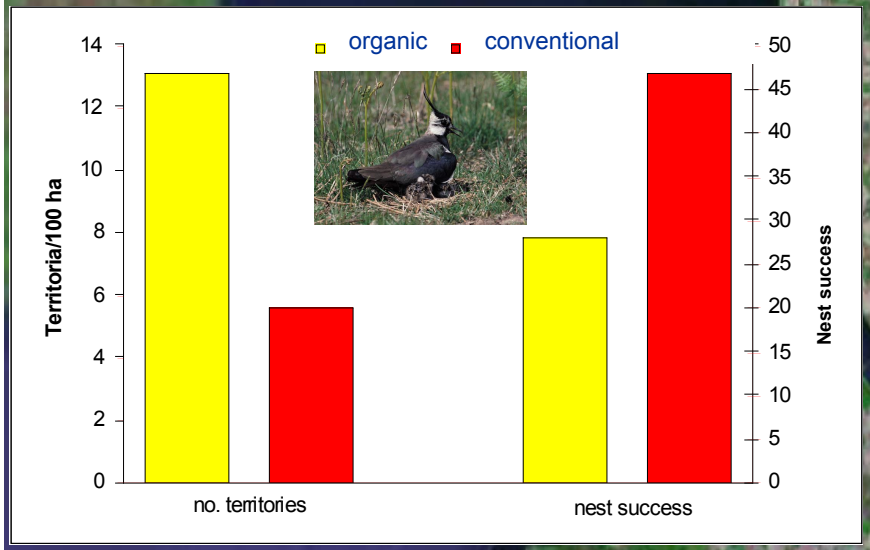
Impact: development + validation of predictive models, reduce animal testing, develop ITS

Impact on biodiversity?

- Bio-assays & experimental field studies
  - Field study concerning effects of herbicides of GM crops on natural ecosystems

Is the alternative better for biodiversity?

Extensive land use: organic farming



Research topics within ECO

1. Task 2.5: Models for quantifying the toxicity of chemical mixtures
   - Pesticides, metals etc.
   - Multiple stressors
   - Model development
   - Focus on field validation of impact of mixtures

2. Task 2.11: Fate/effects nanomaterials + factors affecting actual exposure/effects
   - Link with Nanointeract – Dik van de Meent/Joris Quik (RIVM + RUN)