Environmental Exposure and Risk Assessment cont.

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Today

- Some repetition
- Finding data on biocides
- Exercises on Risk Assessment

Risk assessment (RA)

- **Hazard assessment**
- **Exposure assessment**

Risk characterization

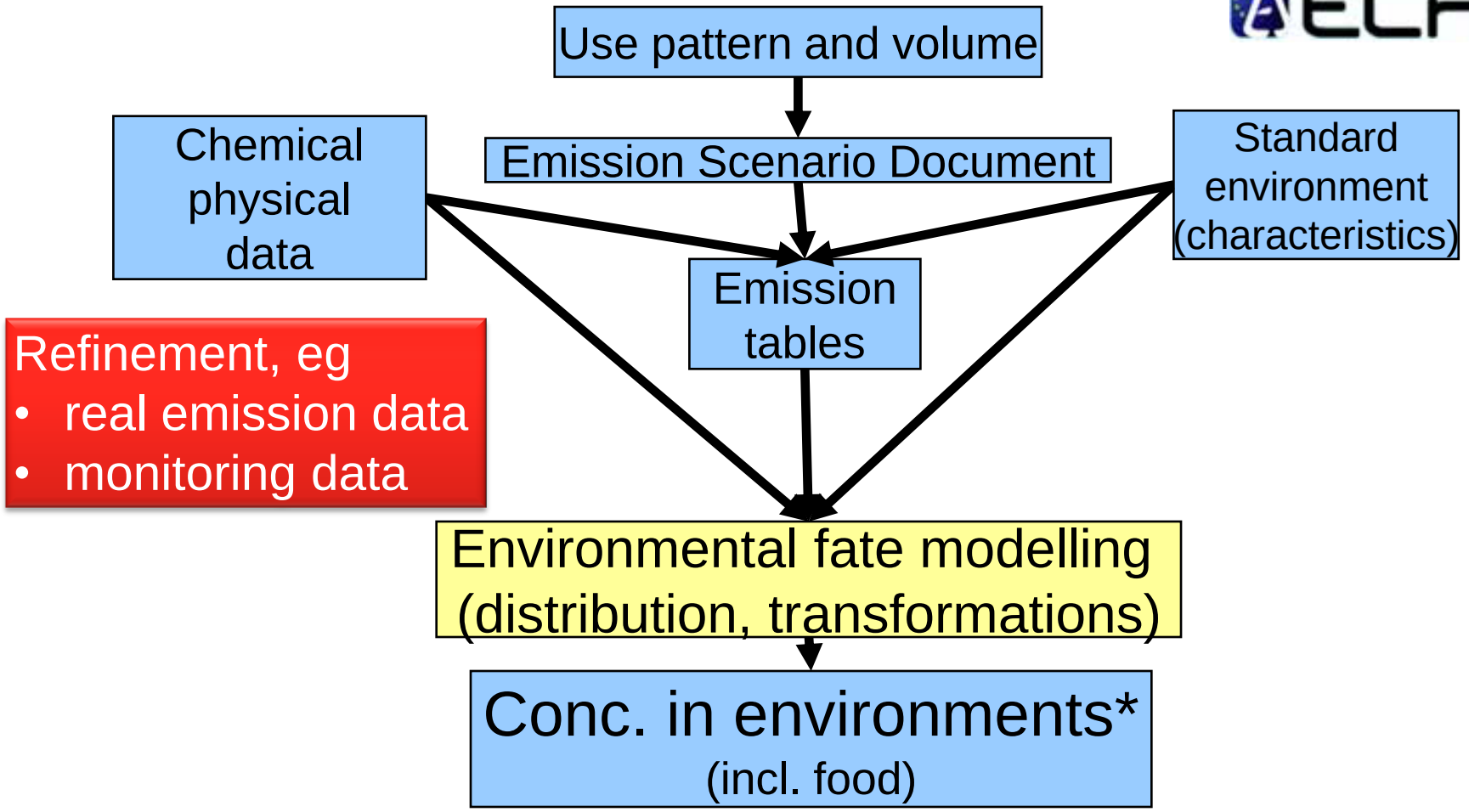
RA for industrial and consumer chemicals (Reach) and biocides versus agro-chemicals: Similar in principle but somewhat different in terms and details

Environmental exposure assessment

Estimation of the concentrations/doses to which organisms in environmental compartments (aquatic, terrestrial, food) are, or may be exposed to.

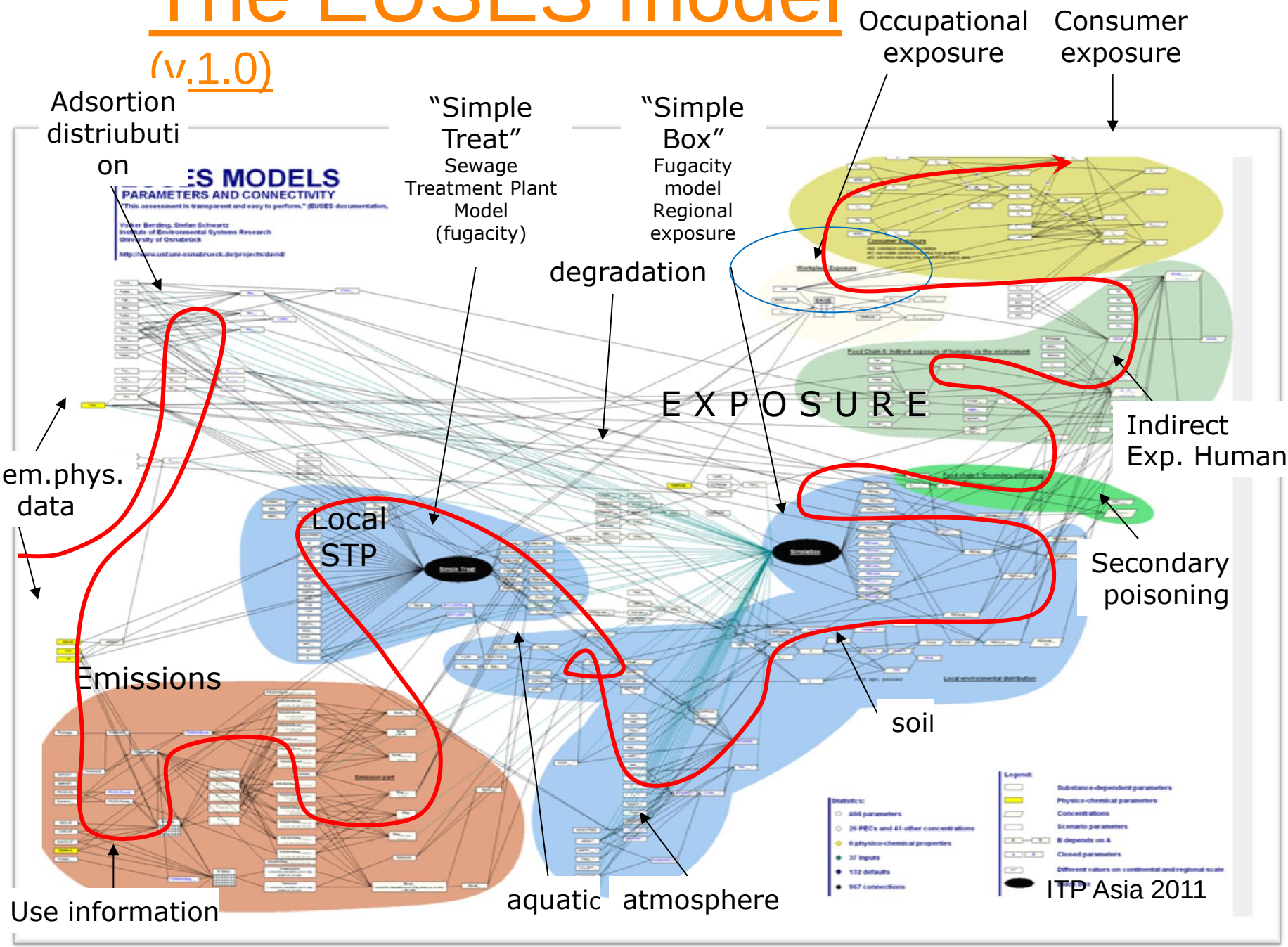
PEC – **P**redicted **E**nvironmental **C**oncentration

Exposure estimates, Reach chemicals and biocides - Generic approach



* Predicted Environmental Concentration (PEC)

The EUSES model (v.1.0)



(Safety) Assessment factors - industrial/ consumer chemicals and biocides

Predicted No Effect Concentration (PNEC) is calculated from NOEC or EC_x divided by an assessment factor

Example $PNEC_{surface\ water}$

Available data	Assessment factor
At least one short-term L(E)C50 from each of three trophic levels of the base-set (fish, Daphnia and algae)	1000 [a]
One long-term NOEC (either fish or Daphnia)	100 [b]
Two long-term NOECs from species representing two trophic levels (fish and/or Daphnia and/or algae)	50 [c]
Long-term NOECs from at least three species (normally fish, Daphnia and algae) representing three trophic levels	10 [d]
Species sensitivity distribution (SSD) method	5-1 (to be fully justified case by case) [e]
Field data or model ecosystems	Reviewed on a case by case basis [f]

Risk characterization

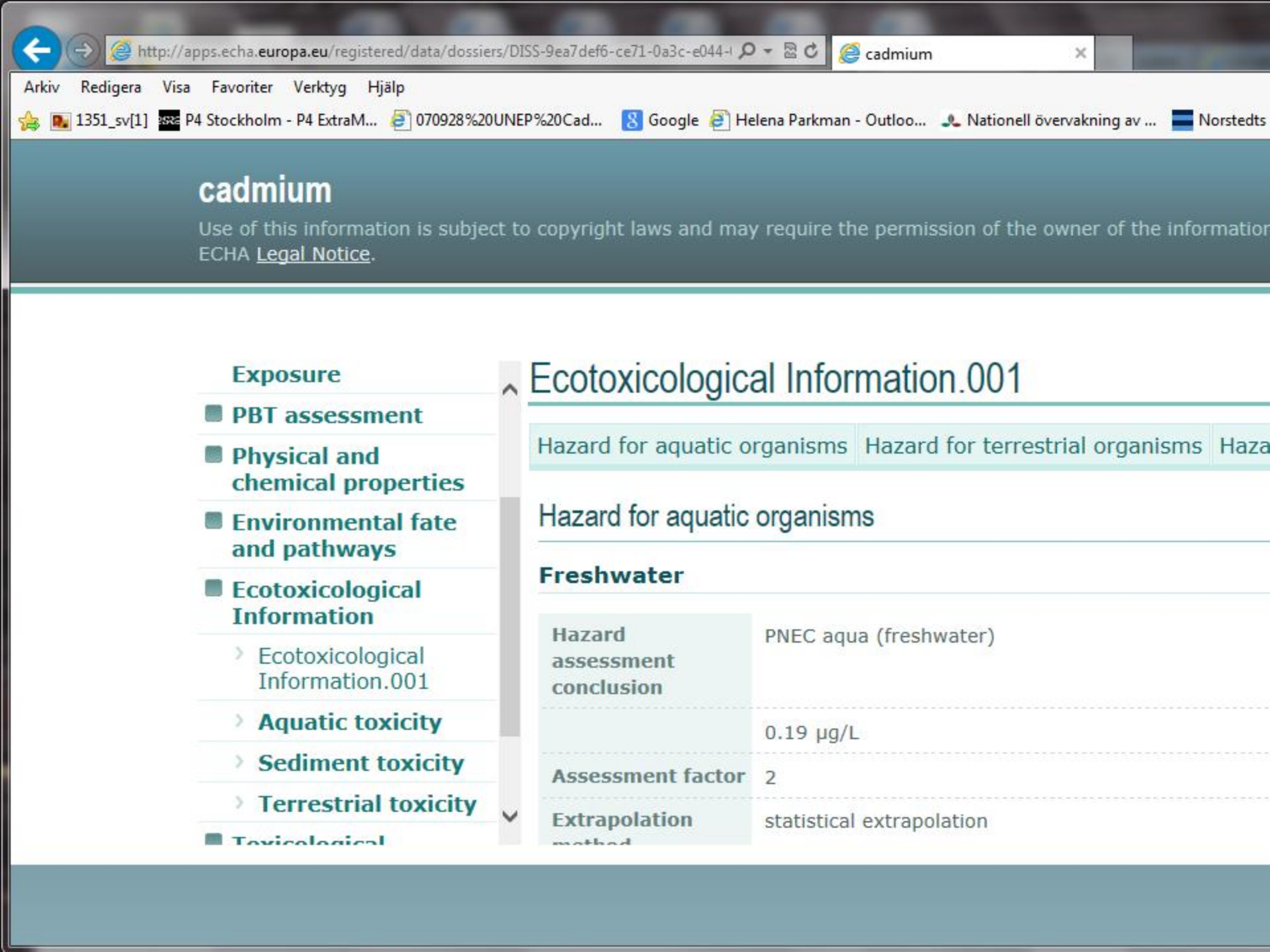
Risk characterization ratio

RCR=PEC/PNEC

In principle:
RCR<1, risk controlled (Reach)/ acceptable (biocides)
RCR>1, risk not controlled/ not acceptable =>
Risk management measures

Example, risk characterization

Concentration in water (estimated or measured); PECwater		0.5 mg/L
Daphnia magna reproduction test (21 days), NOEC		10 mg/L
Fish long-term test, NOEC		50 mg/L
Assessment Factor (AF)		50
PNEC		0.2 mg/L
Risk characterization ratio	PEC/PNEC	**2.5**


http://apps.echa.europa.eu/registered/data/dossiers/DISS-9ea7def6-ce71-0a3c-e044-
cadmium
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1351_sv[1] P4 Stockholm - P4 ExtraM... 070928%20UNEP%20Cad... Google Helena Parkman - Outloo... Nationell övervakning av ... Norstedts
cadmium
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Exposure
PBT assessment
Physical and chemical properties
Environmental fate and pathways
Ecotoxicological Information
Ecotoxicological Information.001
Aquatic toxicity
Sediment toxicity
Terrestrial toxicity
Ecotoxicological Information.001
Hazard for aquatic organisms
Hazard for terrestrial organisms
Haza
Hazard for aquatic organisms
Freshwater
Hazard assessment conclusion
PNEC aqua (freshwater)
0.19 µg/L
Assessment factor
2
Extrapolation
statistical extrapolation

Take home message:

1. Do a stepwise risk assessment!
2. Start simple!
3. Use information that is already available!

Exercise, search Echa website

Use your own monitoring data or i propose

Dibutyltin dilaurate, Cas No: 77-58-7

Trixylyl phosphate, Cas No: 25155-23-1

- Look at information on use. Is there consumer use?
- Volume (tonnage band)?
- Is the chemical/compound (self) classified?
- Assess your own data, or for the two proposed chemicals use
  - $PEC_{aquatic\ (fresh\ water)}$ = 1 µg/L
  - $PEC_{sediment\ (fresh\ water)}$) =1 µg/kg
- Is risk controlled?
- How can the assessment be refined?

RCR= PEC/PNEC