Fitted to your needs

Modelling can help when a risk assessment based on experiments is not convincing the regulators. A scenario analysis may help by adding more realism.
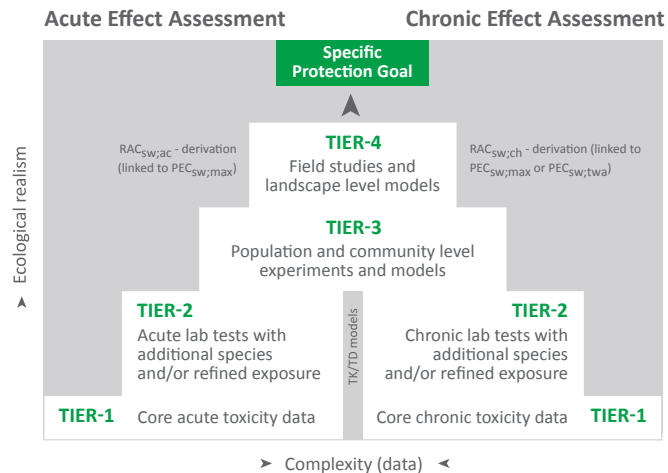
We will be happy to discuss with you how model applications may support the environmental risk assessment of your products. Contact us about any ecological modelling or experimental studies you may need: we will provide solutions for you!

Acute Effect Assessment   **Chronic Effect Assessment**

Specific Protection Goal

Ecological realism

$RAC_{sw;ac}$ - derivation (linked to $PEC_{sw;max}$)

TIER-4
Field studies and landscape level models

$RAC_{sw;ch}$ - derivation (linked to $PEC_{sw;max}$ or $PEC_{sw;twa}$)

TIER-3
Population and community level experiments and models

TIER-2
Acute lab tests with additional species and/or refined exposure

TK/TD models

TIER-2
Chronic lab tests with additional species and/or refined exposure

TIER-1   Core acute toxicity data

Core chronic toxicity data   **TIER-1**

➤ Complexity (data) ◄

Tier 1 and tier 2 effect assessments are based on single-species laboratory toxicity tests, but tier 2 assessment may be complemented with TK-TD models. Tier 3 and tier 4 may concern a combination of experimental data and modelling to assess population and/or community level responses (e.g. recovery, indirect effects) at relevant spatio-temporal scales. (EFSA, 2014)

Why Ecological Modelling?

ibacon supports chemical industries since 1994 with efficient experimental laboratory and field studies for the environmental risk assessment of their products. Experience shows that experimental data cannot answer all questions risk assessors have. Often, further experiments may be too laborious, too time-consuming or even technically unfeasible. This is where Ecological Modelling can help.

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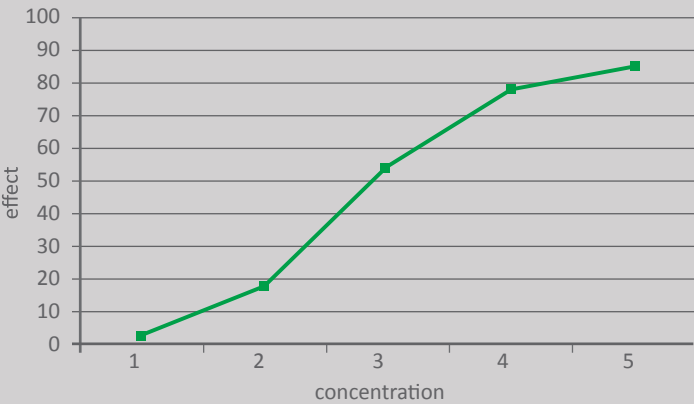phone: +49 6154 697-238

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ibacon

We think ahead – we think of you

ECOLOGICAL MODELLING

Enhancing experimental data

for the Environmental Risk Assessment

Laboratory Study

EFSA:
Models support the Environmental Risk Assessment

Recent EFSA guidance documents ask for Ecological Modelling, especially at higher tier levels of the Environmental Risk Assessment. This is to enhance the understanding of experimental results and to learn more about how populations of the organisms deal with the investigated exposure.

Good modelling practice

ibacon's modelling work follows EFSA's GMP principles, e.g. fully documentation of problem definition, model formulation, formalization, implementation and setup including sensitivity and uncertainty analysis. That's not only for our own standards. It's to achieve full acceptance by regulatory bodies.

Natural Populations

Ecological Modelling can give answers

- **Most susceptible stage?**
  Which life stage or developmental phase of an organism is most susceptible to an exposure?

- **Recovery potential?**
  Can recovery be expected after an initial effect on populations of non-target organisms?
  How much recovery time will a population need?

- **Different exposure scenarios or different environmental condition?**
  Usually experimental data exist for certain exposure and environmental conditions or a certain experimental region. What can we expect under different exposure, in other regions or at changed environmental conditions?

- **Long-term effects?**
  How will an impact discovered in laboratory experiments influence real world population development?

Ecological Modelling
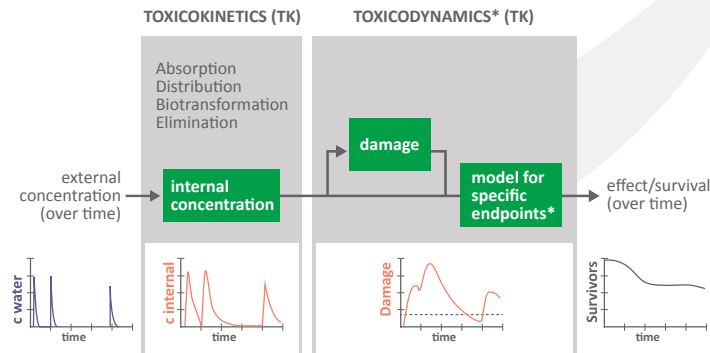
GUTS model conceptuation from Ducrot et al. Integr Environ Assess Manag 999, 2015

ibacon's modelling portfolio

Currently, ecological modelling is a highly dynamic field. Ibacon has established most recent modelling techniques and quality assessments of modelling results. At least as important is our active involvement in current developments of new models within the international modelling community. Some examples of our portfolio are listed below, we will be happy to explain to you any solutions fitted to your needs.

- **GUTS**
  Generalized Unified Threshold model of Survival to analyse survival data

- **DEBtox**
  model for the analysis of sublethal effects

- **DEB-IBM**
  for Toxicokinetic-toxicodynamic (TKTD) modelling on population level

- **BEEHAVE**
  for the Honey Bee population level