

Statistical Ecotoxicology

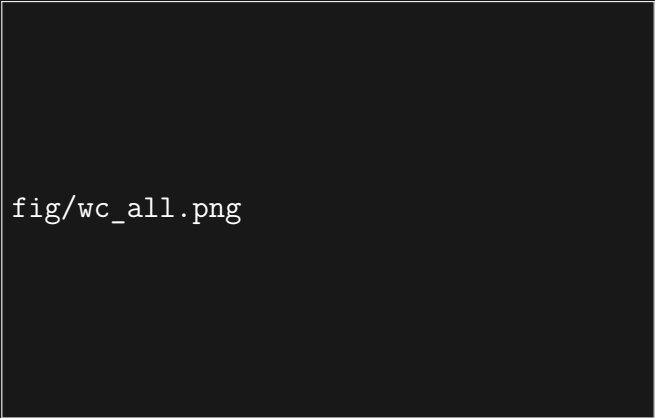
- Improving the utilization of data for ecological risk assessment

Eduard Szöcs

Institute for Environmental Sciences, University of Koblenz-Landau

Landau, 22.09.2016

My field of research is somewhere between...

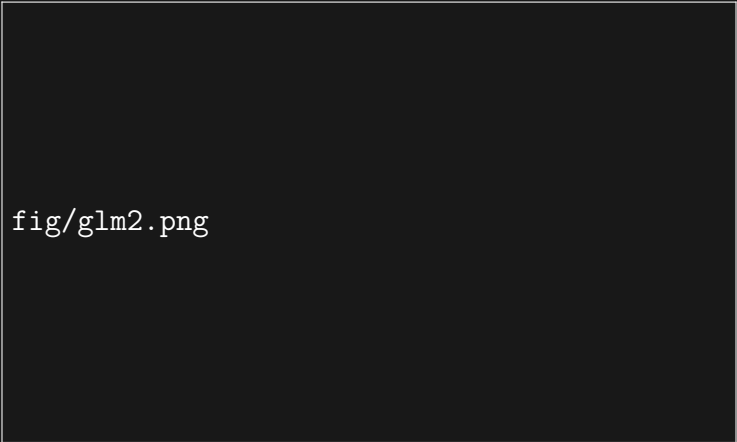


fig/wc_all.png

... Eco(-toxico)logy, Data Analysis & Programming

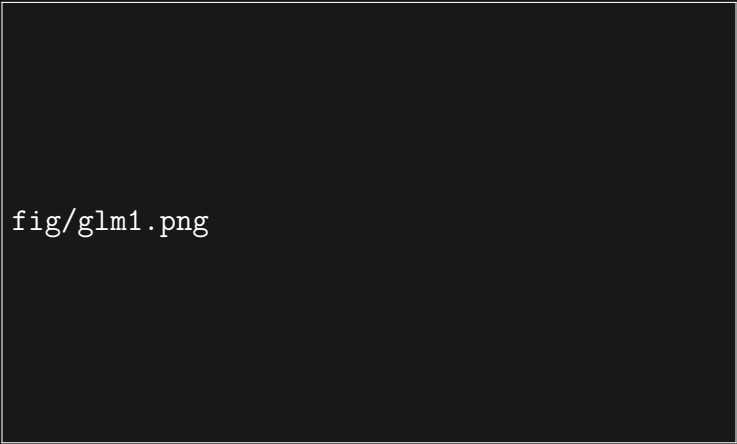
Intro stats session

Statistical Power in current experimental designs in ecotoxicology is unacceptably low



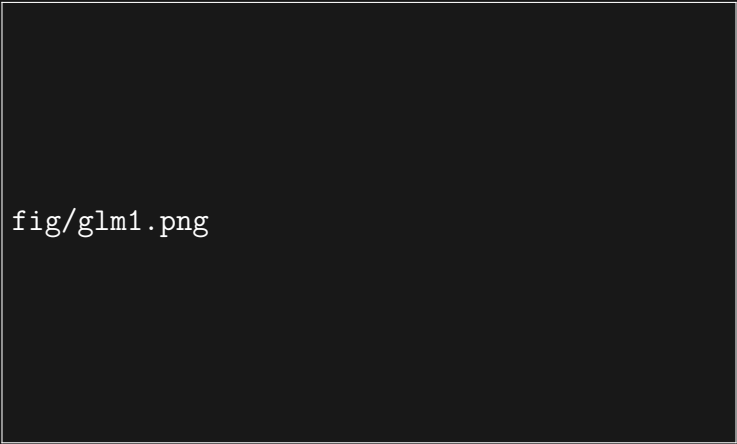
fig/glm2.png

Generalized Linear Models can do better



fig/glm1.png

Generalized Linear Models can do better



fig/glm1.png

Better abandon NOEC and use a regression design ¹...

¹ debated since 30 years.

Biologists and Chemists face similar problems...

Synonyms, Typos, Errors

Osmia rufa, *Osmia bicornis*,

Osmia ruffa, *Osmia unilandaui*,

Osmia spec.

Chlorpyrifos, Chlorpyriphos,

Chlorphyrifos, Chlorpyrifos-ethyl,

Chlorpypifot

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Chlorpyrifos, Chlorpyrifos,
Chlorpyrifos, Chlorpyrifos-ethyl,
Chlorpyrifot

Hierarchy

Hymenoptera/ Apoidea/
Megachilidae/ *Osmia*/ *rufa*

organophosphate, ester,
insecticide

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<i>Osmia ruffa</i> , <i>Osmia unilandaui</i> ,	Chlorphyrifos, Chlorpyrifos-ethyl,
<i>Osmia spec.</i>	Chlorpypifot

Hierarchy

Hymenoptera/ Apoidea/	organophosphate, ester,
Megachilidae/ <i>Osmia</i> / <i>rufa</i>	insecticide

Attributes

Wing length, mass, season	mass, K_{OW} , LC_{50}
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Identifiers

NCBI: UID, ITIS: CID, ...

2921-88-2, Clc1c(OP(=S)[...],
InChI=1S/C9H11C[...],
SBPBAQFW[...], CSID,...

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2993 taxa

489 pesticides
(+ 590 other organics)

Instead of wasting time...

webchem



fig/fig1.pdf

Instead of wasting time...


webchem



fig/fig1.pdf

"webchem ...likely saved hundreds of working hours"¹

... use our software!



fig/ropensci.png

¹ Münch (2016)

Instead of wasting time...

taxize

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- Improving the utilization of data for ecological risk assessment

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https://github.com/edild/talk_work2

fig/Cc-by-nc_euro_i