

# TERENO Pesticide Initiative

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Beketov M.A., Münze R., Khrycheva P., Gunold R.,  
Paschke A., Kaske O., Hundt M., Bauer C., Möder M.,  
Reemtsma T., Brack W., Scholz S., Schüürmann G., Liess M.

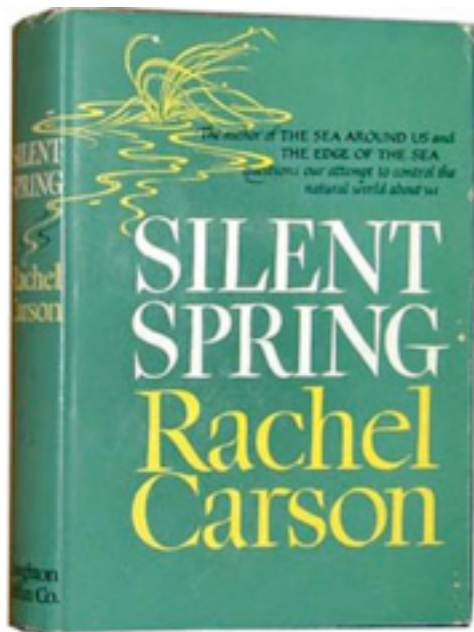
# What is the aim of ecotoxicology?



# Central questions in ecotoxicology?

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Still remain to be solved



from 1962 to 2012 ... yet there was lots of progress

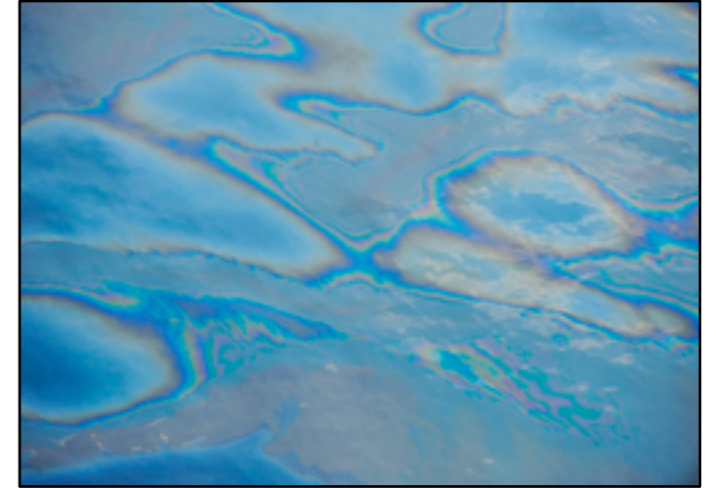
Beketov M.A., Liess M., 2012. *Environ. Pollut.*, 162: 247–254.

# Pesticides – Biodiversity

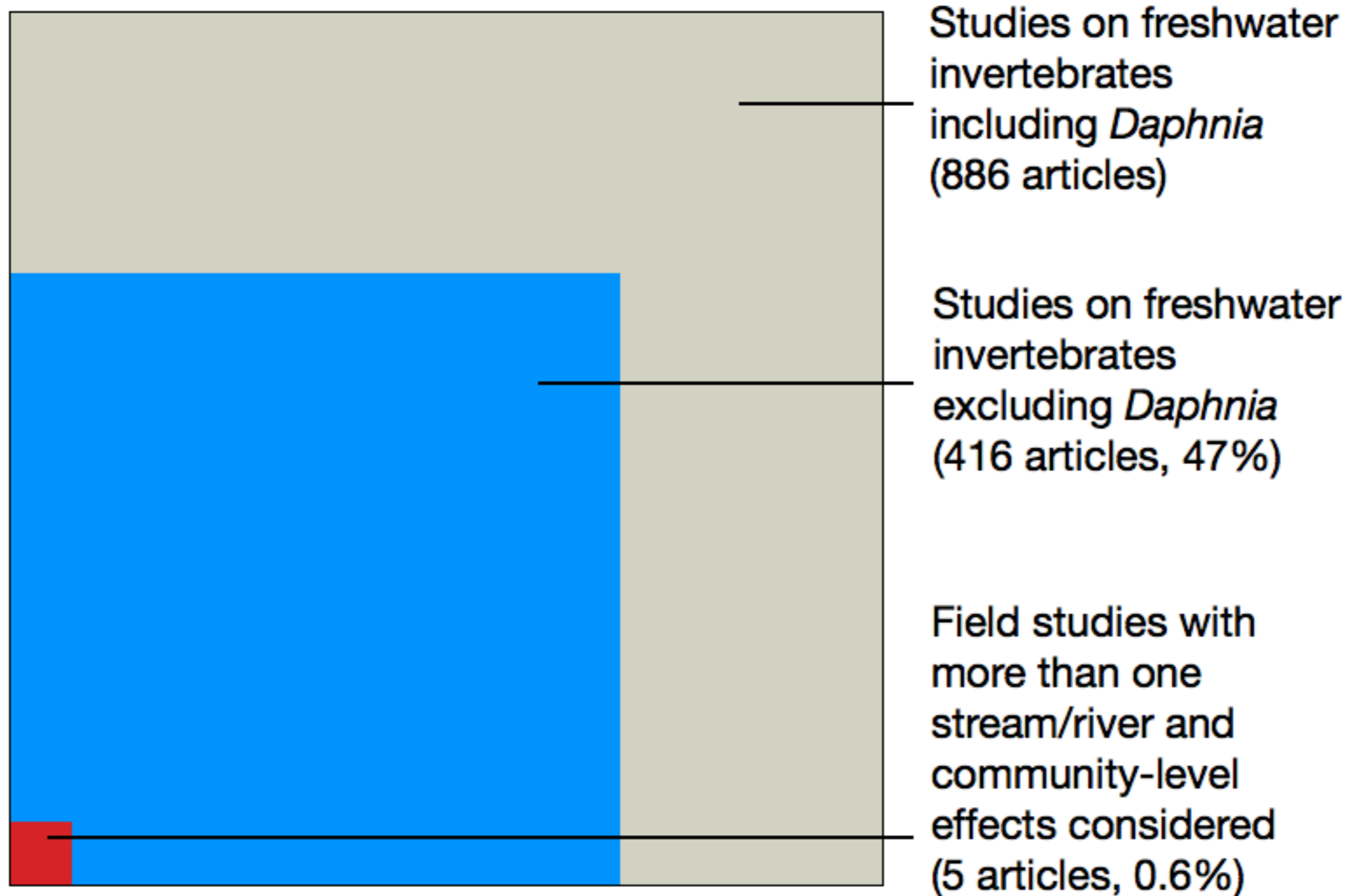


e.g. Gibbs et al., 2009; Geiger et al., 2010.

- Toxicants – Great Barrier Reef
- Pharmaceuticals – effects in the real world
- Oil spills – large-scale effects



Beketov M.A., Liess M., 2012. *Environ. Pollut.*, 162: 247–254.



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# Why it is so bad?

# What is required to improve it?

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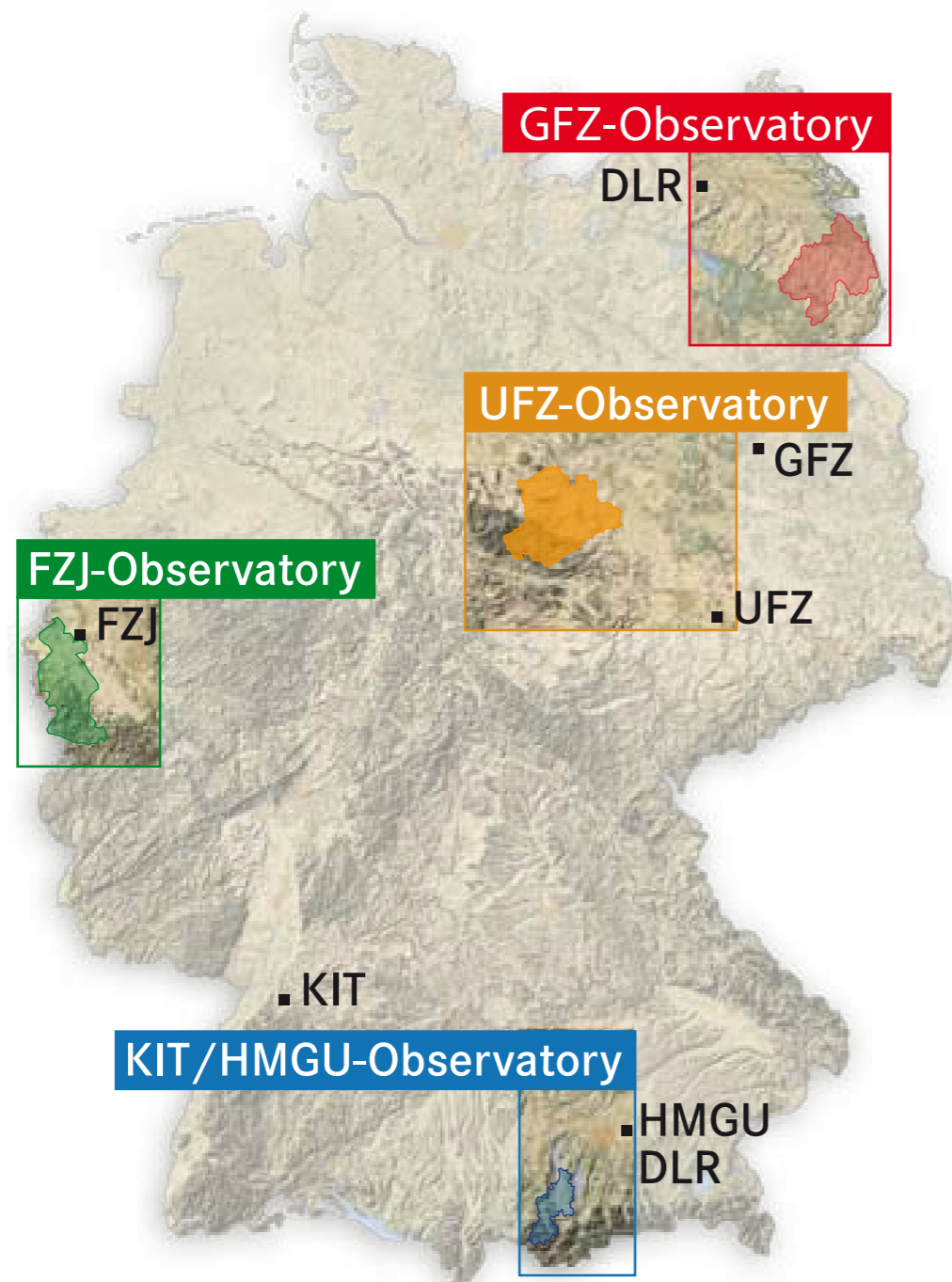
Relevant ideas

Multidisciplinary expertise

Methods

Resources

# Landscape as a laboratory



Relevant ideas  
Multidisciplinary  
expertise  
Methods  
Resources

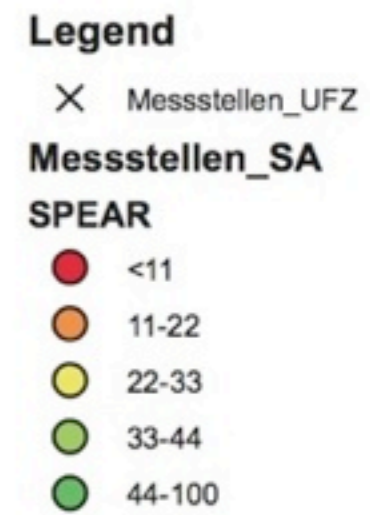
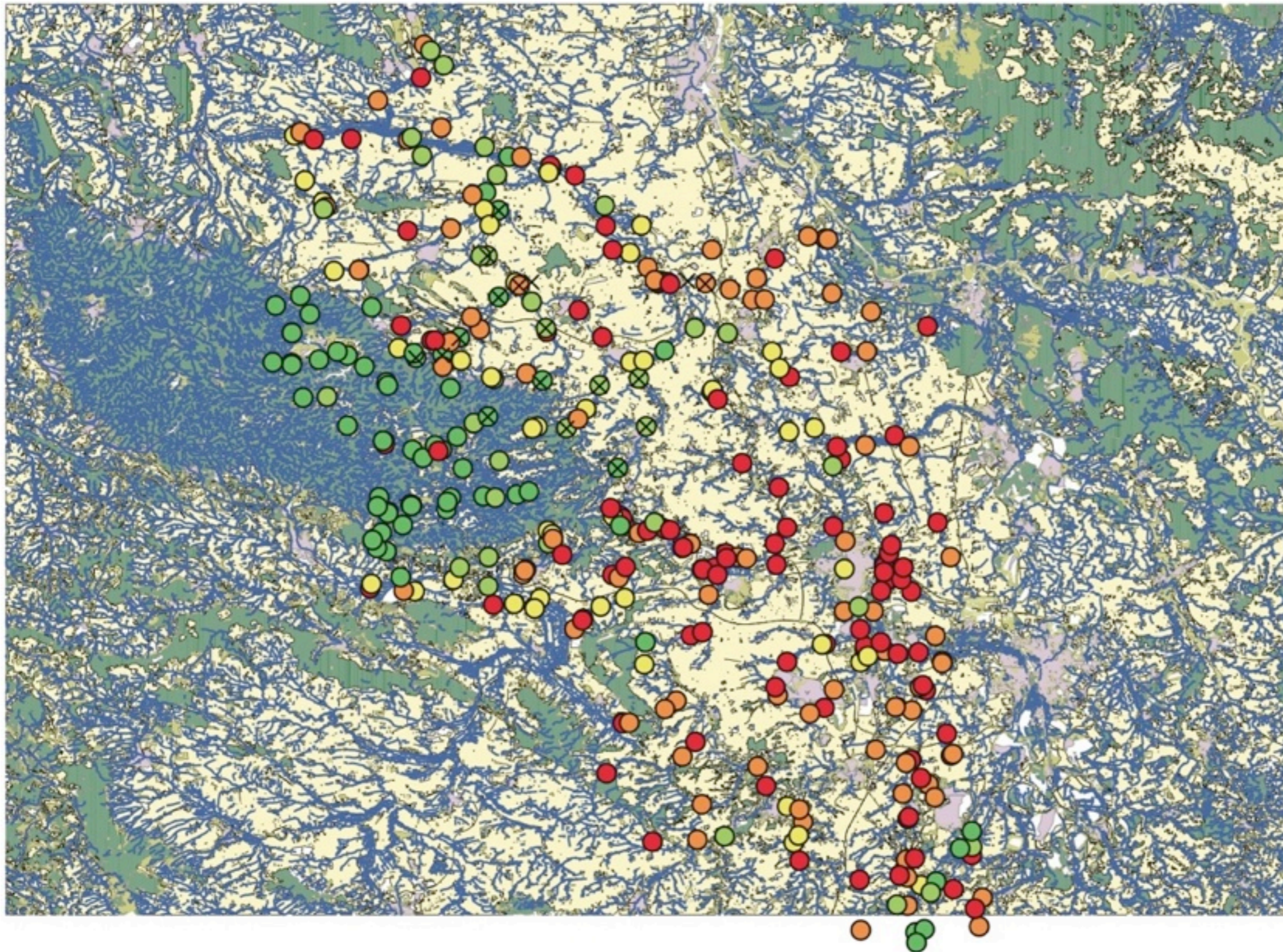


# Our aim:

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Understanding:  
in the real world  
at the large spatial scale

## Solutions!

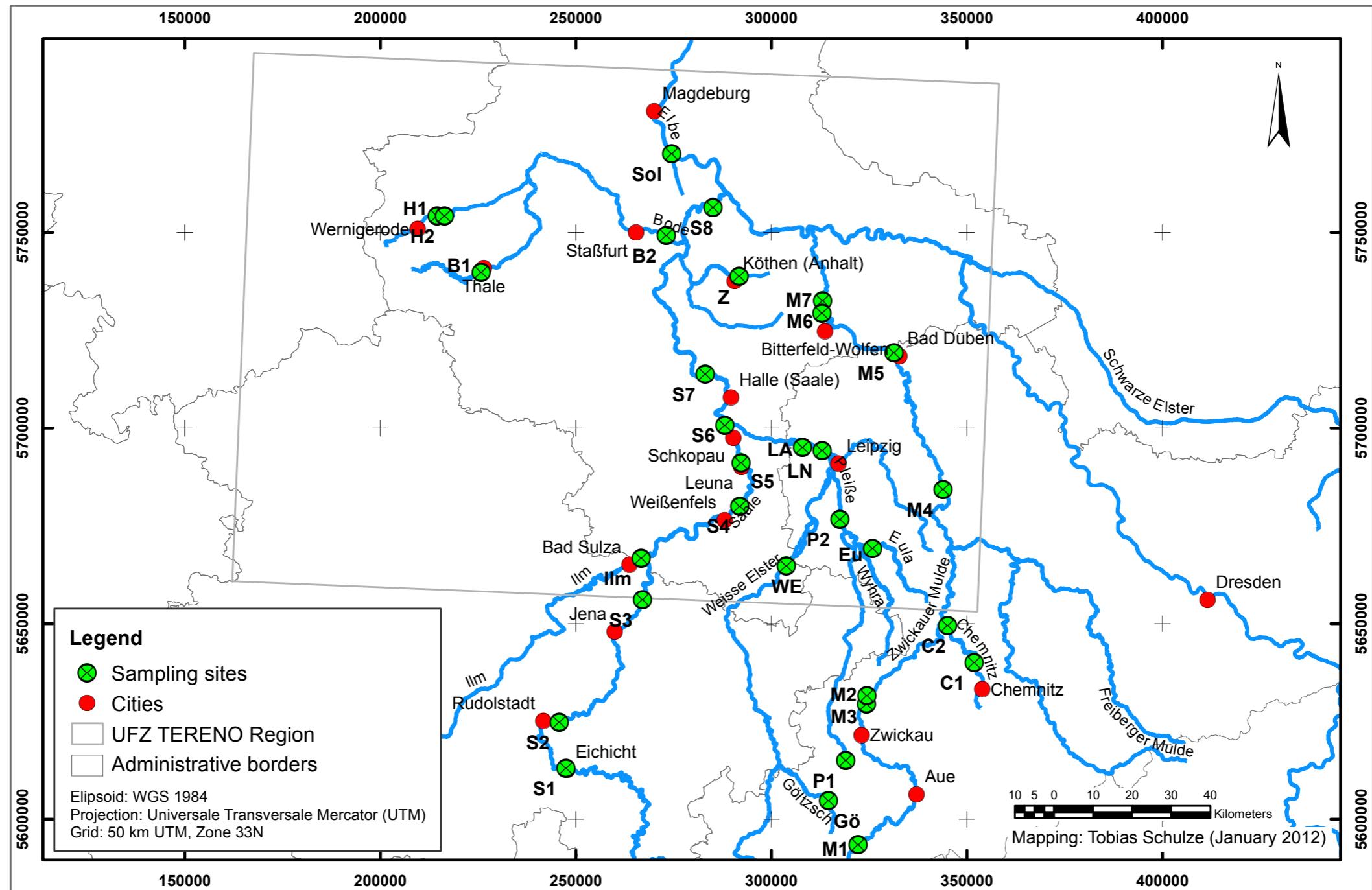


GIS Model of the run-off potential  
LHW, Magdeburg, Biomonitoring data



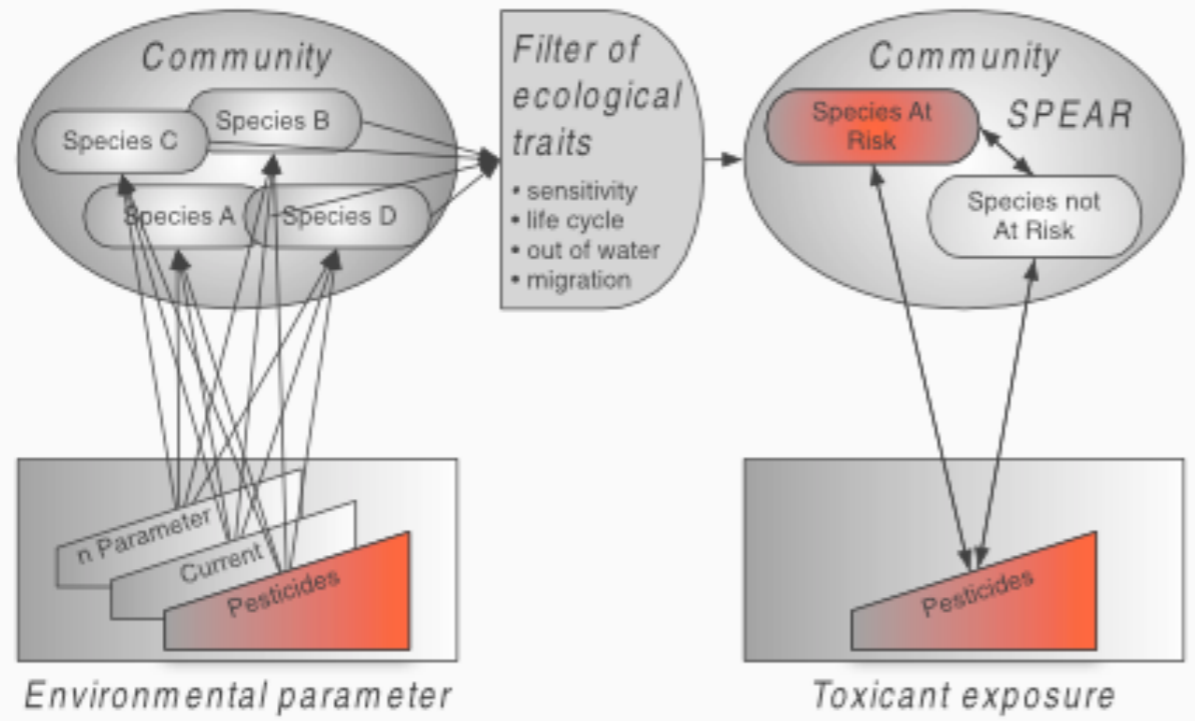
Exposure assessment,  
Passive samplers,  
Event-driven samplers





Data sources: Rivernetwork Saxonia-Anhalt (Landesbetrieb für Hochwasserschutz und Wasserwirtschaft Sachsen Anhalt, Gen-Nr. LHWS ...  
 Rivernetwork Saxonia (Sächsisches Landesamt für Umwelt und Geologie)  
 Open Street Map (Geofabrik Karlsruhe, C-BY-SA 2.0)

# Water Treatment Plants, effluents assessment



# Effect assessment, SPEAR

# SPEAR<sub>pesticides</sub>

Toxicant sensitivity  
Presence as vulnerable stage  
Generation time  
Migration ability

- High
- During exposure
- Long
- Low

Species not at Risk

SPEcies At Risk



Liess & von der Ohe 2005. Environ. Toxicol. Chem. 24: 954-65.  
Beketov et al., 2009. Environ. Pollut. 157: 1841-8.

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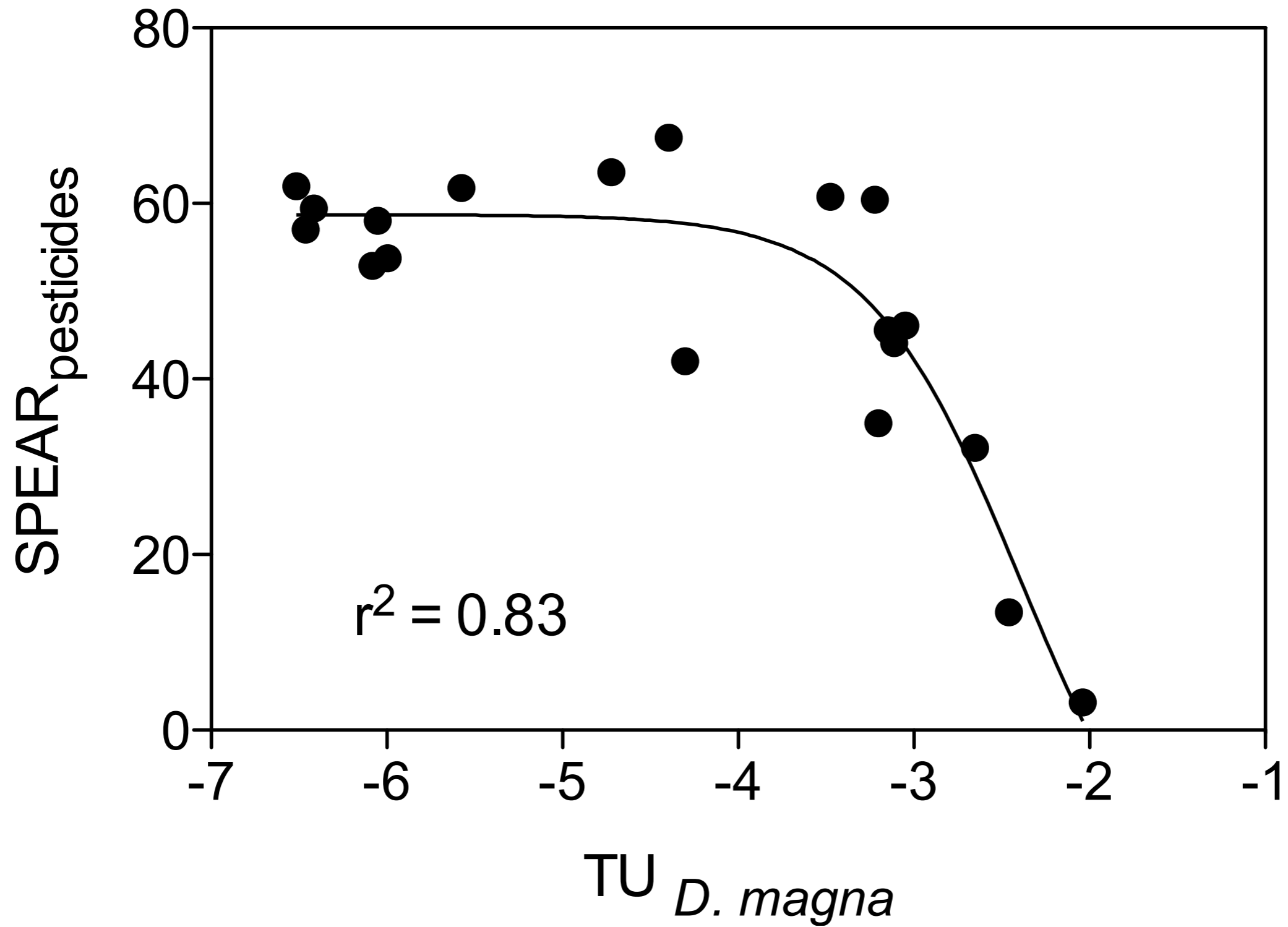
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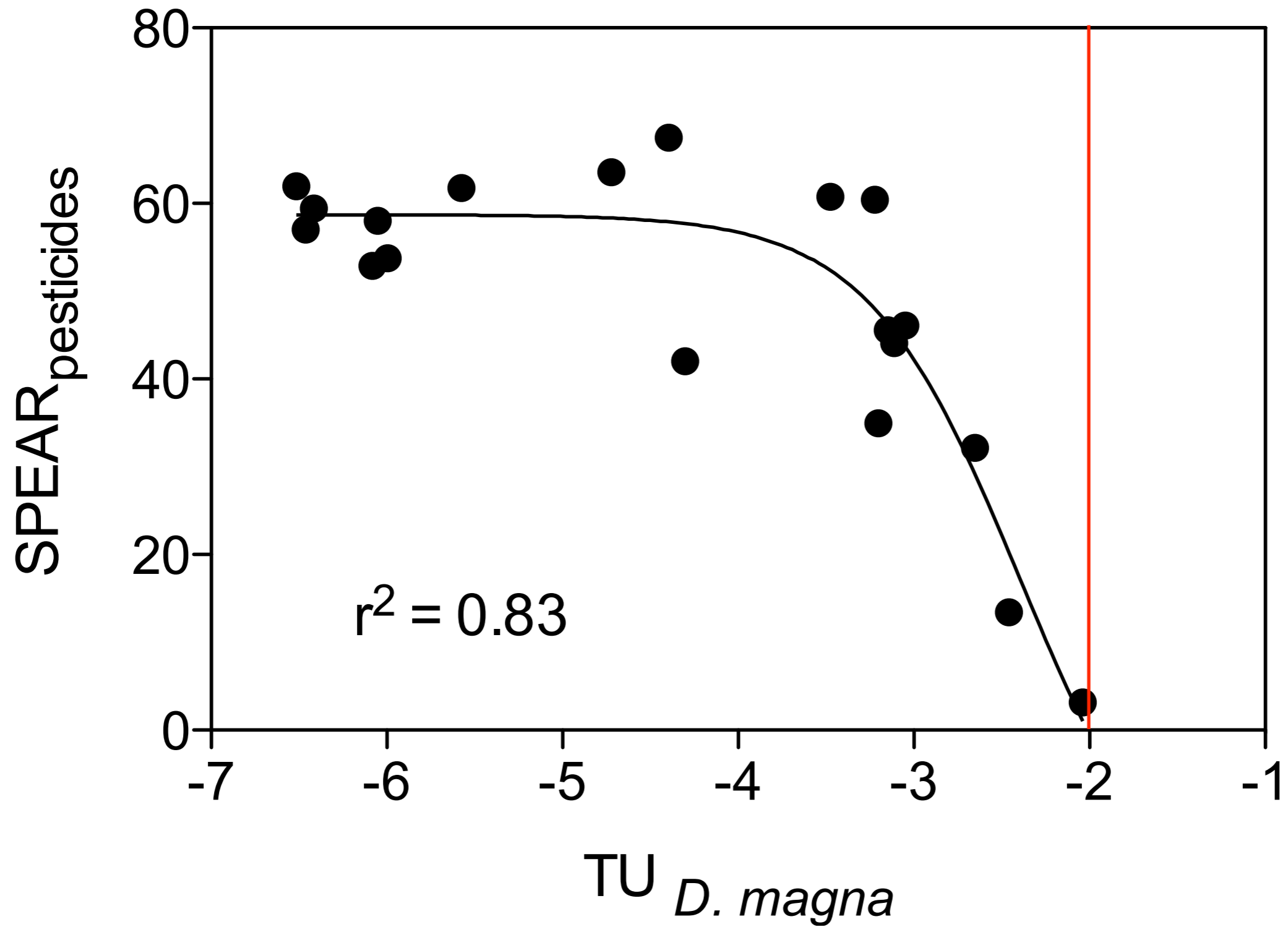


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Effect assessment, SPEAR





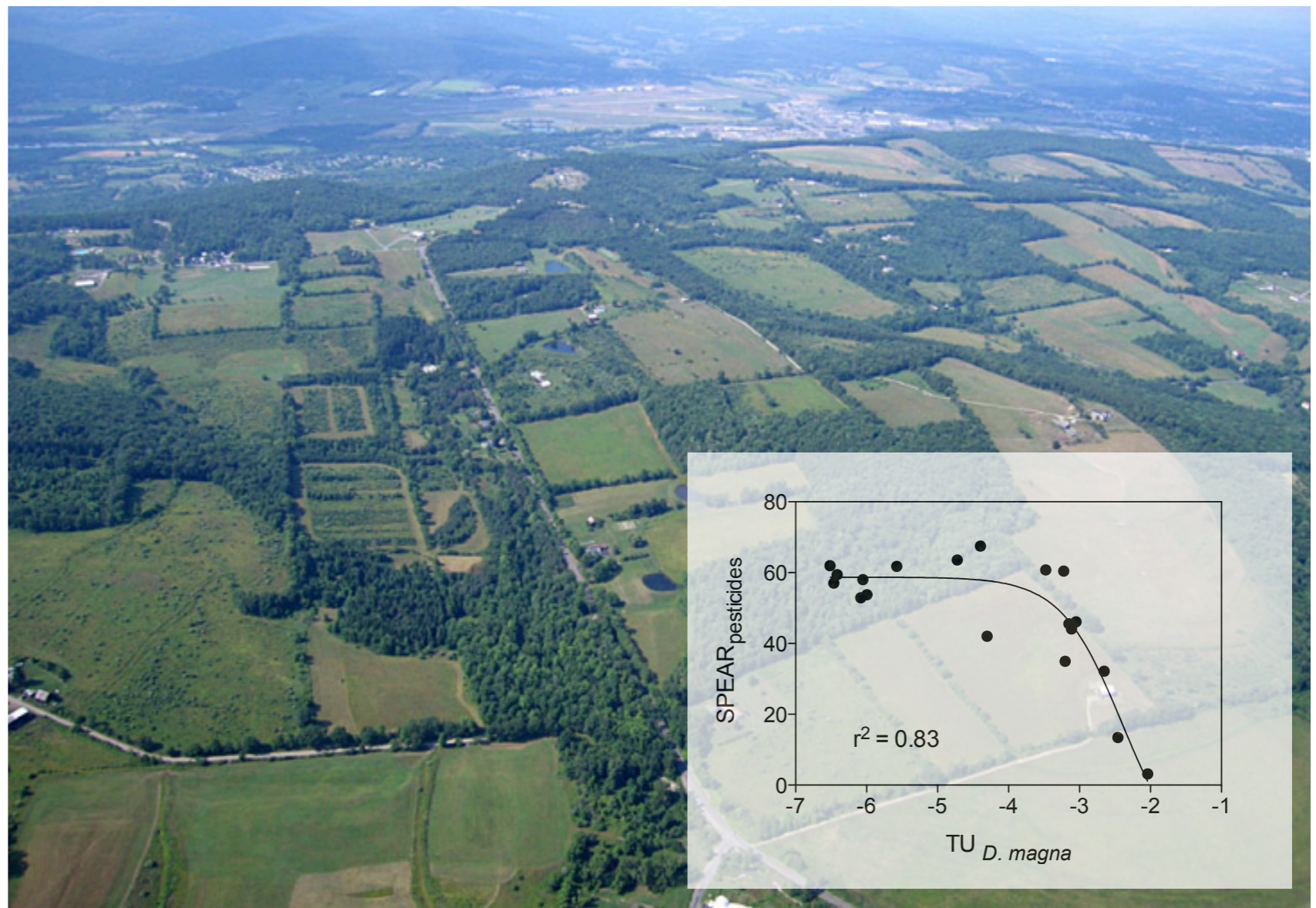
Effect assessment, SPEAR

Pesticides do have a specific effect on the ecosystems.

The effect concentrations are specific.

Risk assessment is unrealistic.

Multiple factors interact.



# Future

Landscape planning – recovery areas

Risk assessment  
improvement

Biodiversity  
assessments



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Landscape planning – recovery areas

Risk assessment  
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Biodiversity  
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**Thank you!**