

# Effects of Pesticides on Streams

Matthias Liess



# Food Production





# Drinking water Biodiversity Recreation



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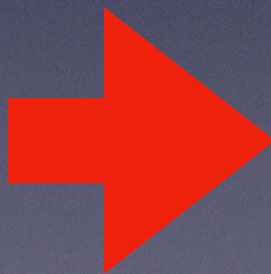


# Pesticide Effects:



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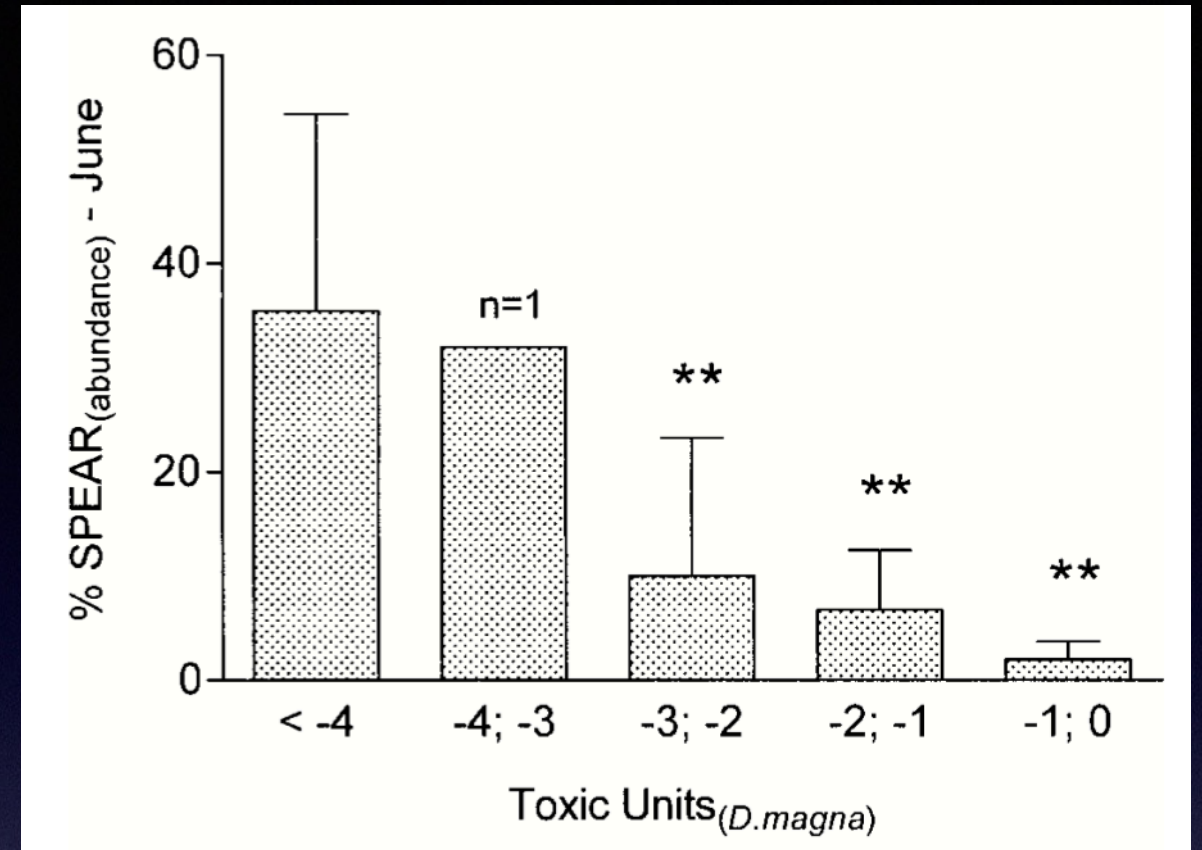
## Change of Community



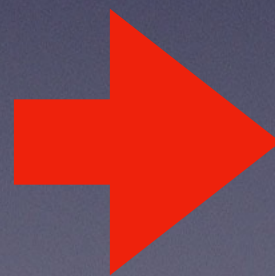


# Pesticide Effects:

## Change of Community



Liess & v.d. Ohe 2005. ETC

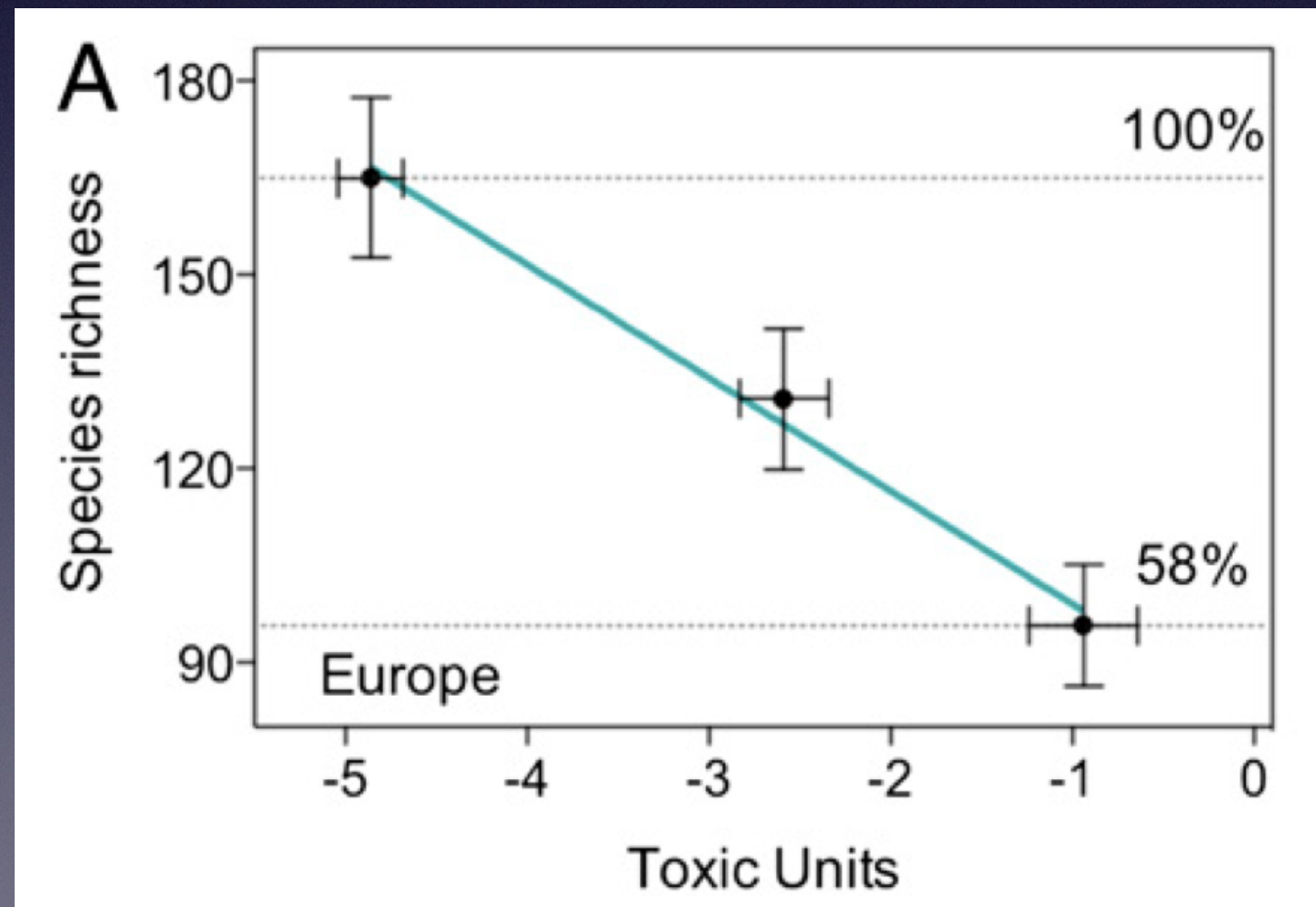




# Pesticide Effects:

Change of Community

Reduction of Biodiversity



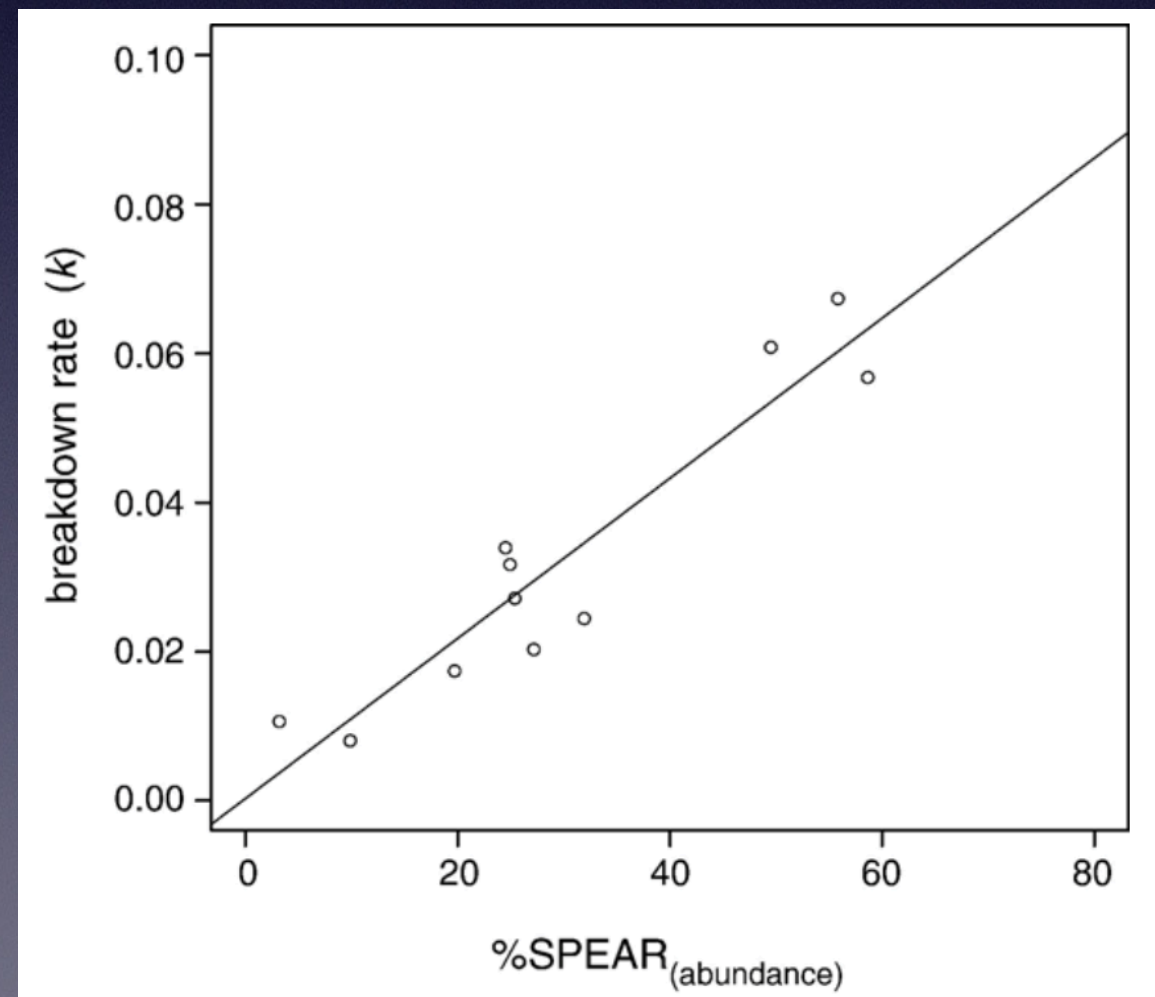


# Pesticide Effects:

Change of Community

Reduction of Biodiversity

Reduced Self Purification





# Pesticide Effects:

Change of Community

Reduction of Biodiversity

Reduced Self Purification

## Europe

- Denmark
- Germany
- Finland
- France

*Schafer et al. 2012, ES&T*

*Liess et al. 2005, ET&C;*

*Münze et al. 2017, STOTEN*

*Knillmann et al. 2018 STOTEN*

*Liess et al. 2008, STOTEN*

*Liess et al. 2008, STOTEN*

## Global

- Argentina
- Australia

*Hunt et al. 2017, STOTEN*

*Schafer et al. 2012, ES&T*



# Registration:

„no unacceptable impact on the viability of exposed organisms...”  
(Annex VI, Directive 91/414/EEC)



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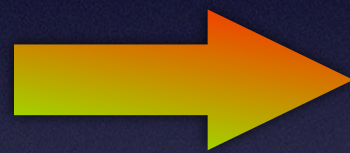
Obviously Fails



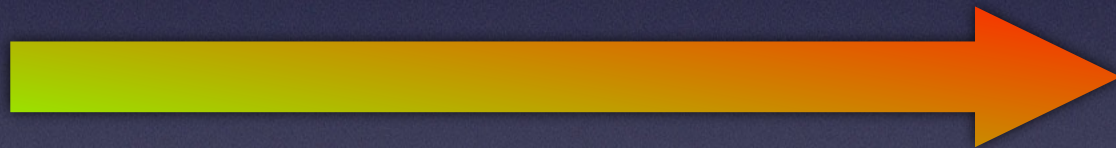


Regulatory Acceptable Conc.

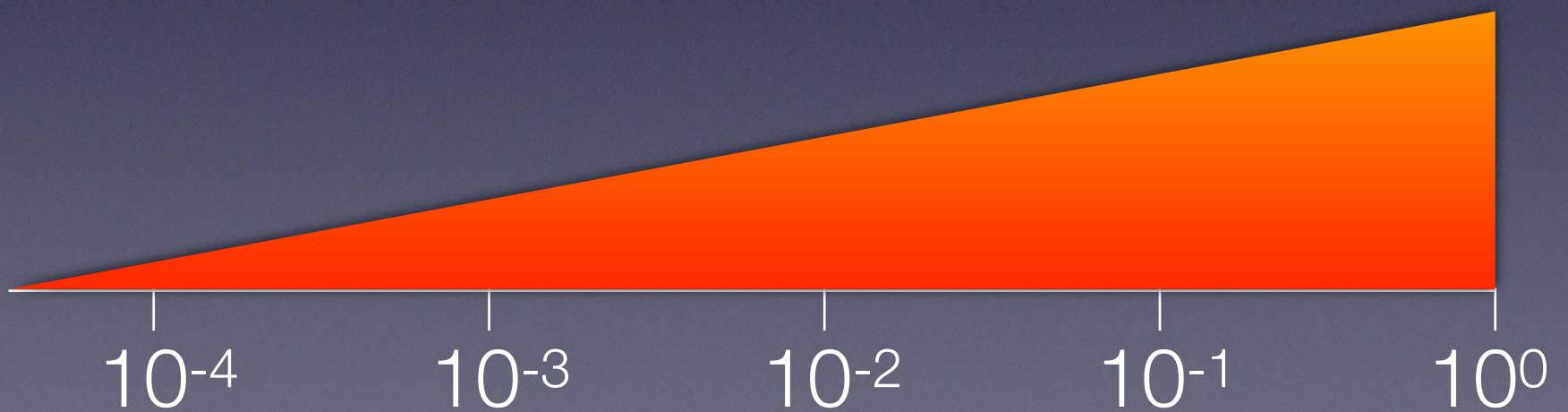
Often too High



Effects Environment



Registration

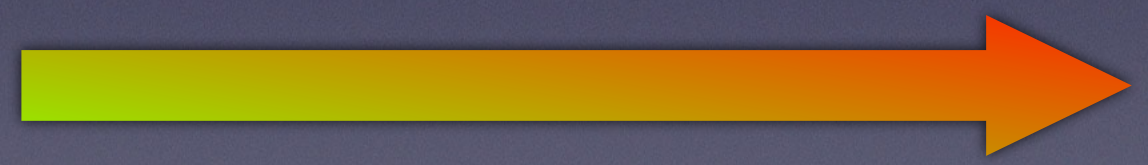
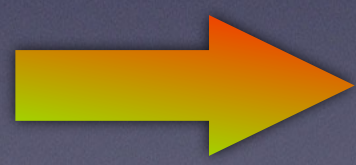


Safe Concentration (Ratio LC<sub>50</sub>)



1

100



Effect Environment

Registration



# Multiple Requirements



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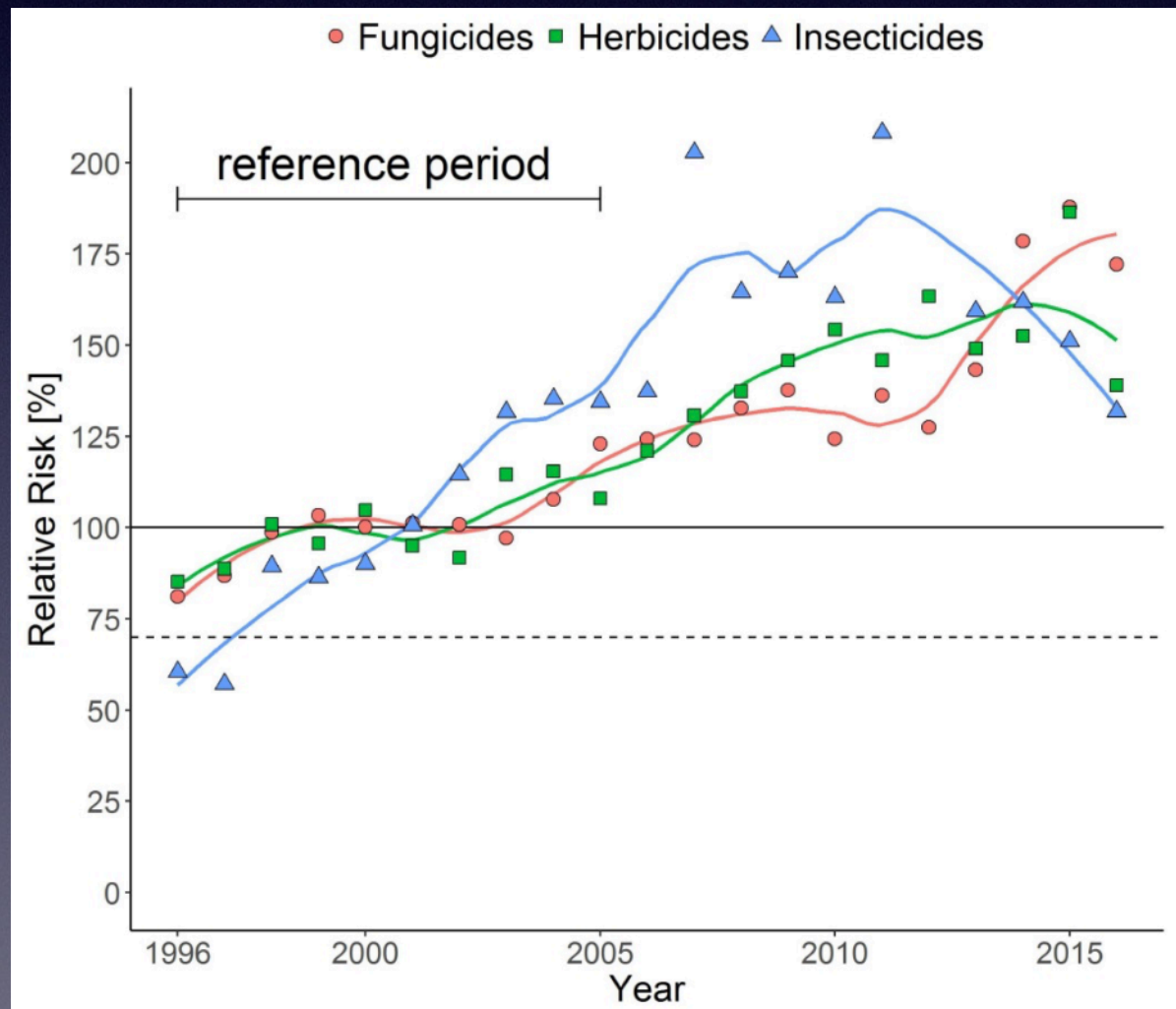


What to do (1):

Face Reality - quantify the causes

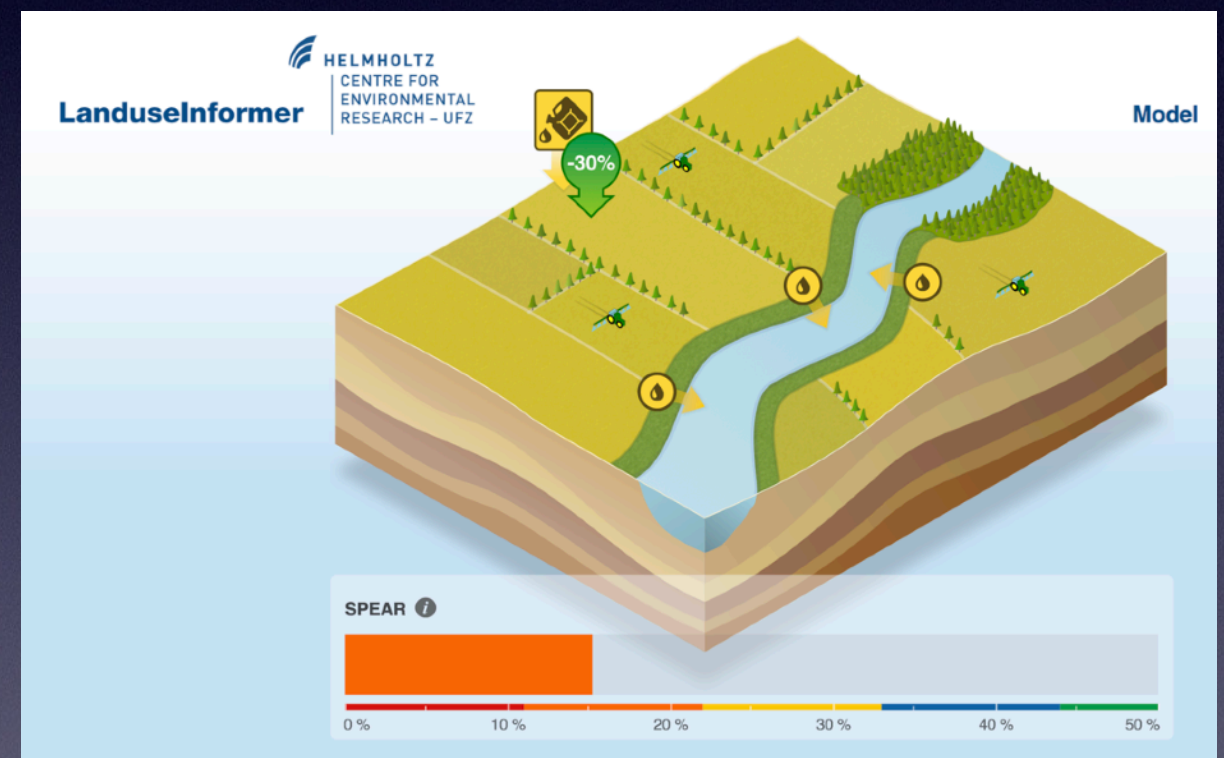
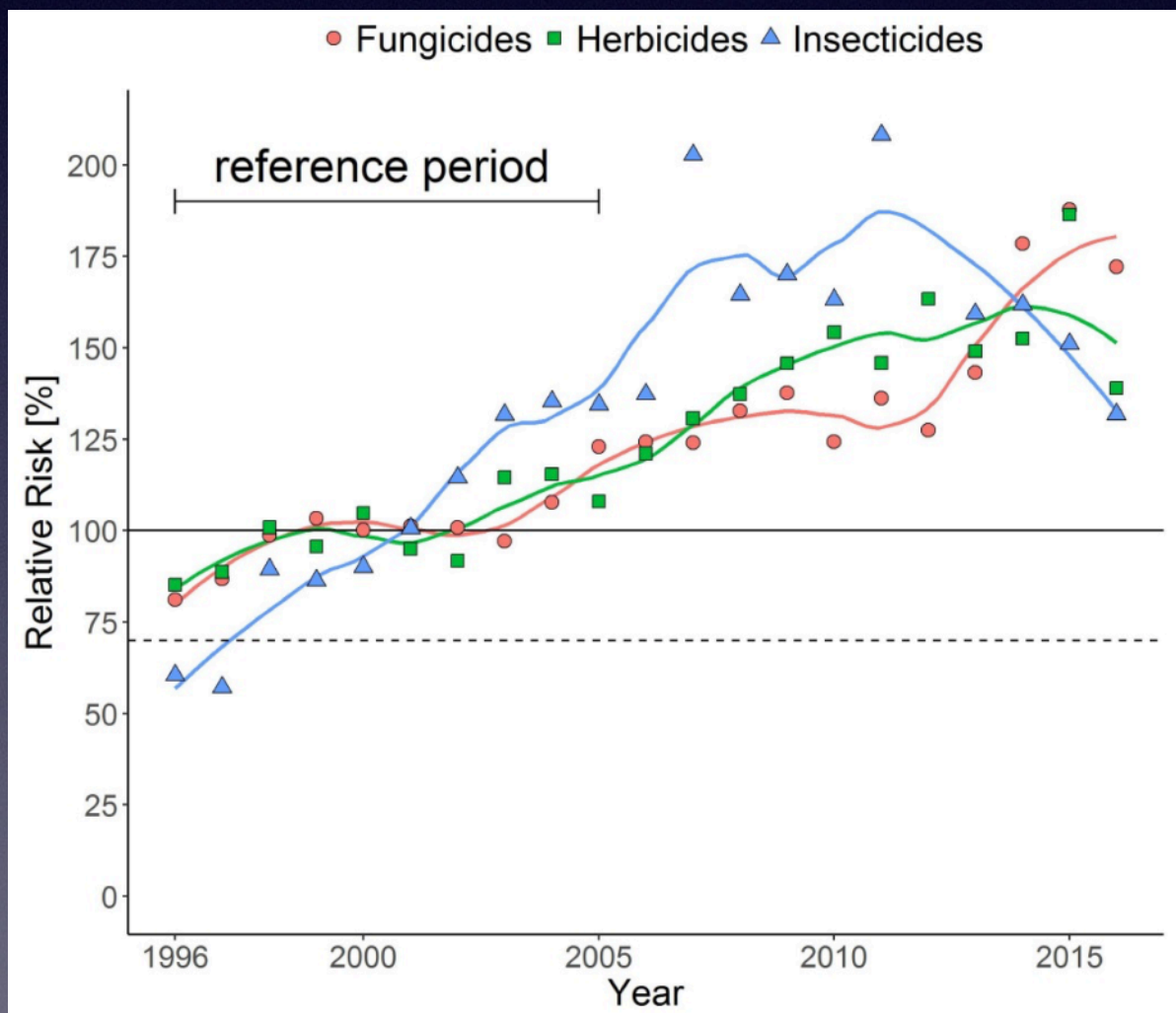


# German NAP aims to reduce Pesticide Risk by 30%





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90% Reduction of Pesticide Toxicity  
Reduces Environm. Effects by 30%



All disasters in (eco) toxicology  
were uncovered by monitoring



DDT, Bald Eagle

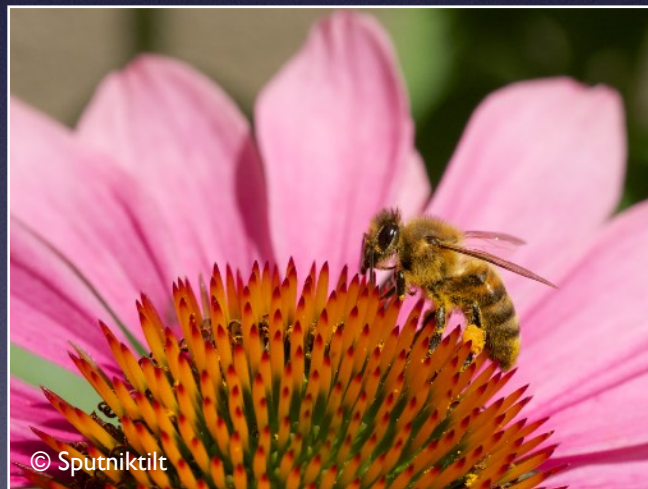




All disasters in (eco) toxicology  
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DDT, Bald Eagle



Neonicotinoids Bees

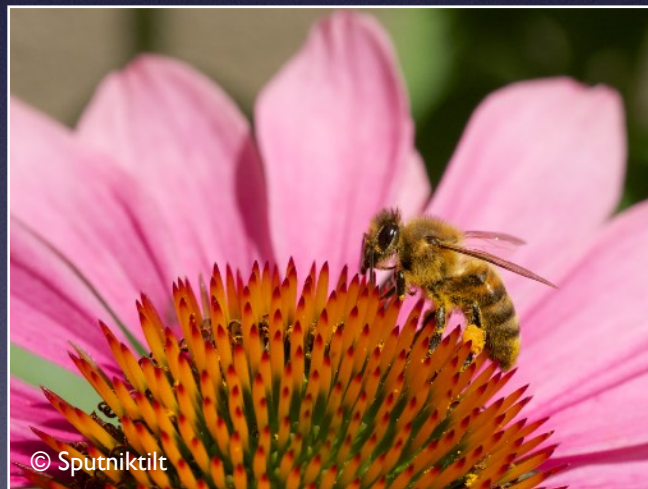




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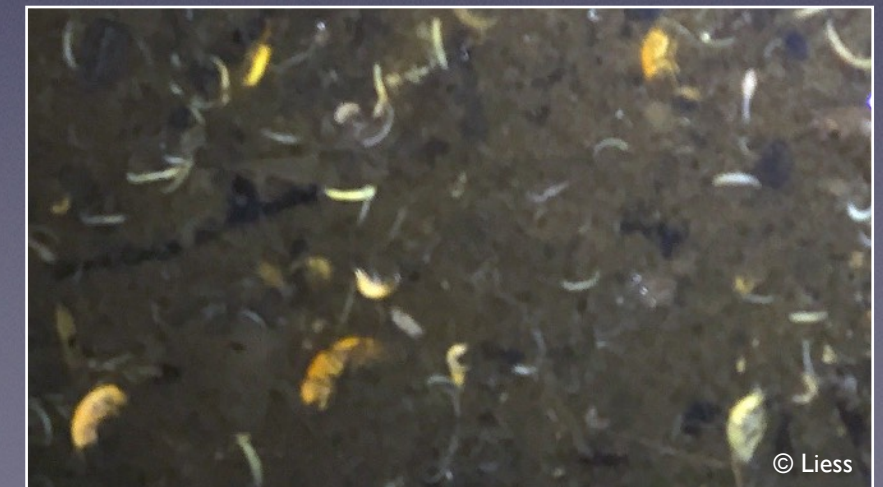
DDT, Bald Eagle



Neonicotinoids Bees



Pesticide Effects, Streams





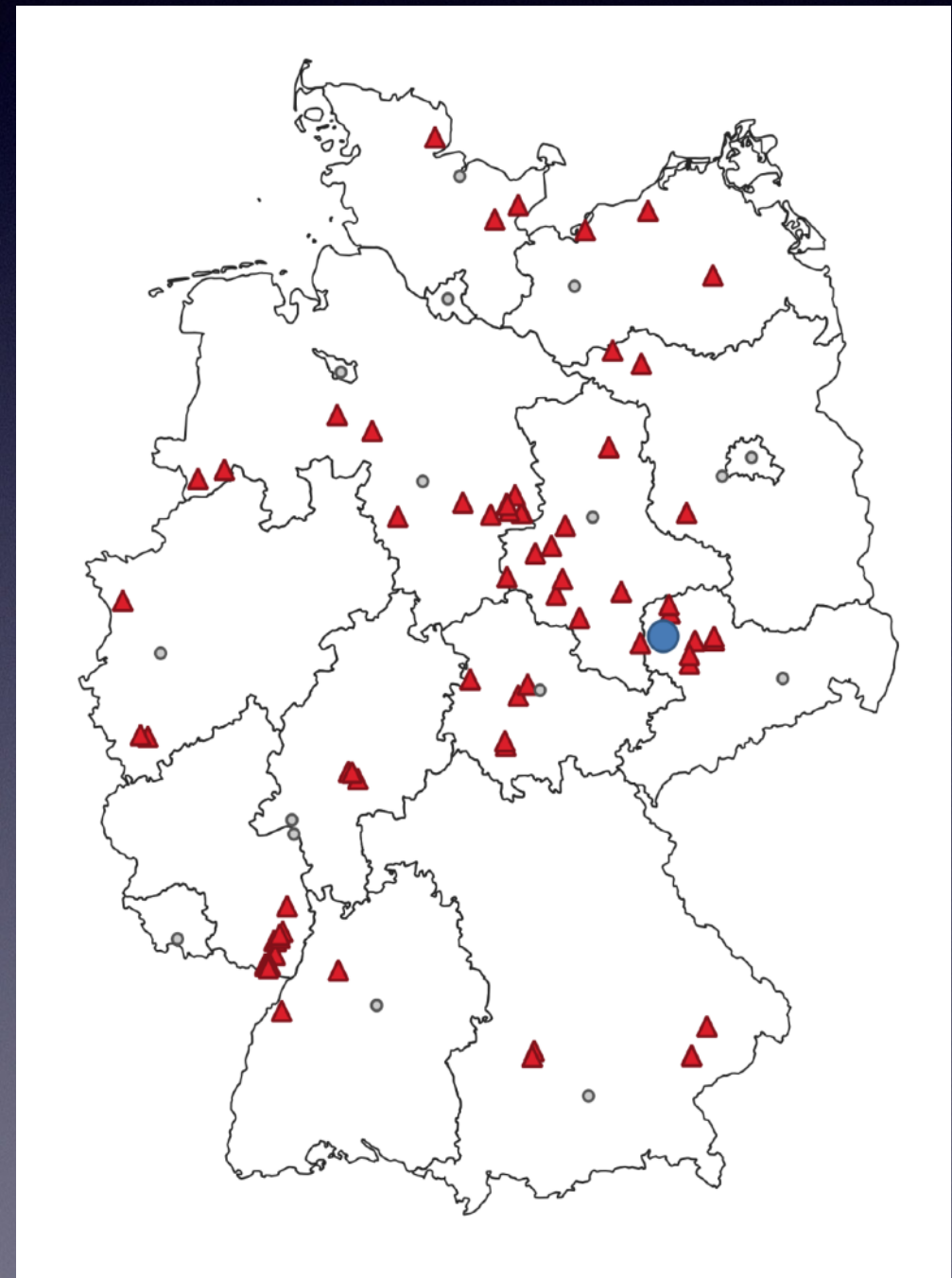
# WFD needs to include sound pesticide exposure & effect monitoring



KgM



Kleingewässer  
Monitoring





What to do (2):

Reduce Pesticide Exposure



An aerial photograph of a rural landscape. On the left, there is a dense forest of trees with varying shades of green and brown. To the right of the forest is a large, brown, tilled field with visible tire tracks. A narrow, winding stream or ditch runs along the edge of the field. In the bottom right corner, there is a small white building and some circular structures. A road is visible at the very bottom of the image.

e.g.

Bufferstrips  
Pesticide Tax  
Organic Farming