WHAT CAN ECOTOXICOLOGY GAIN FROM A MACROEVOLUTIONARY LENS?

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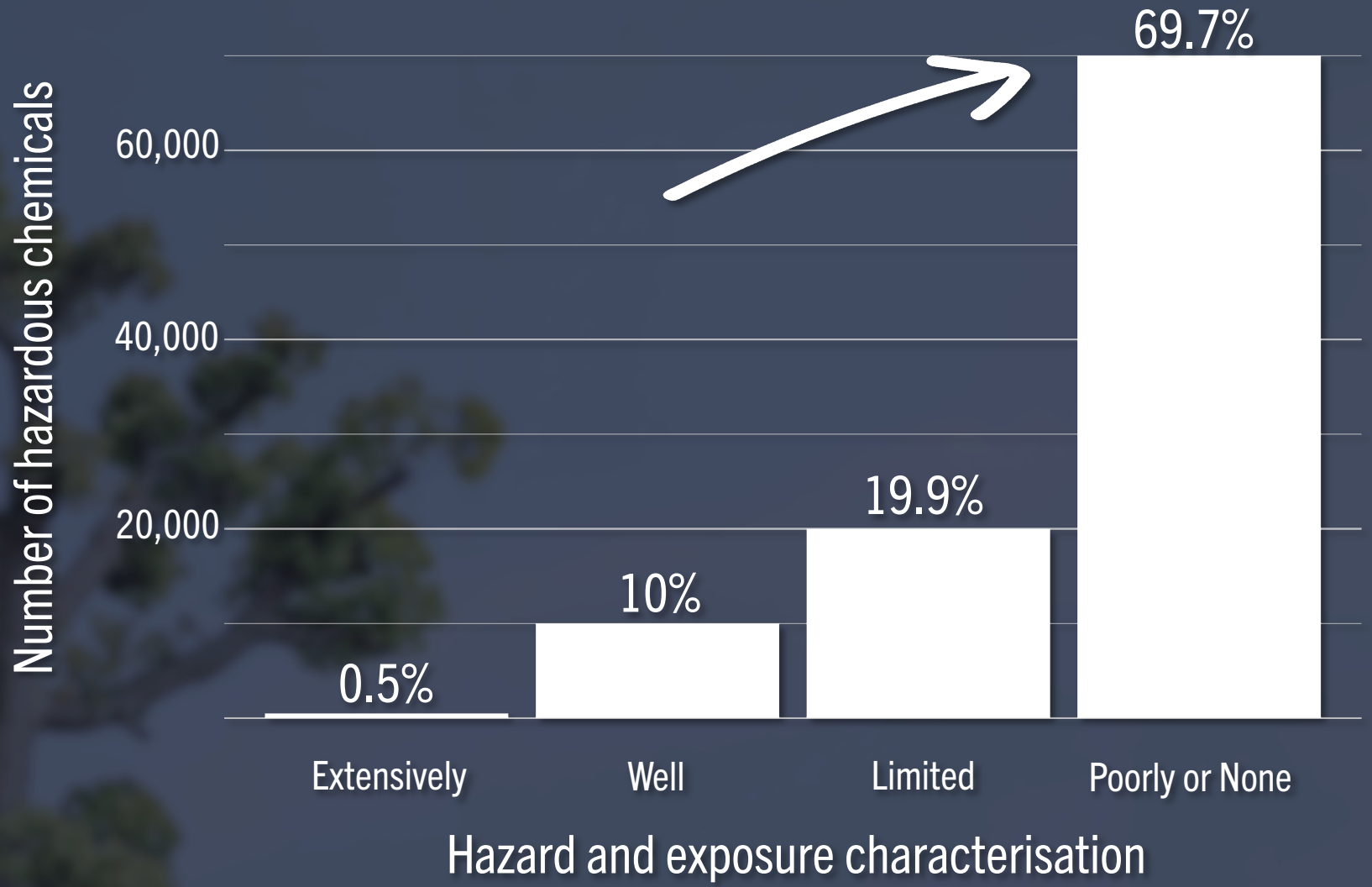
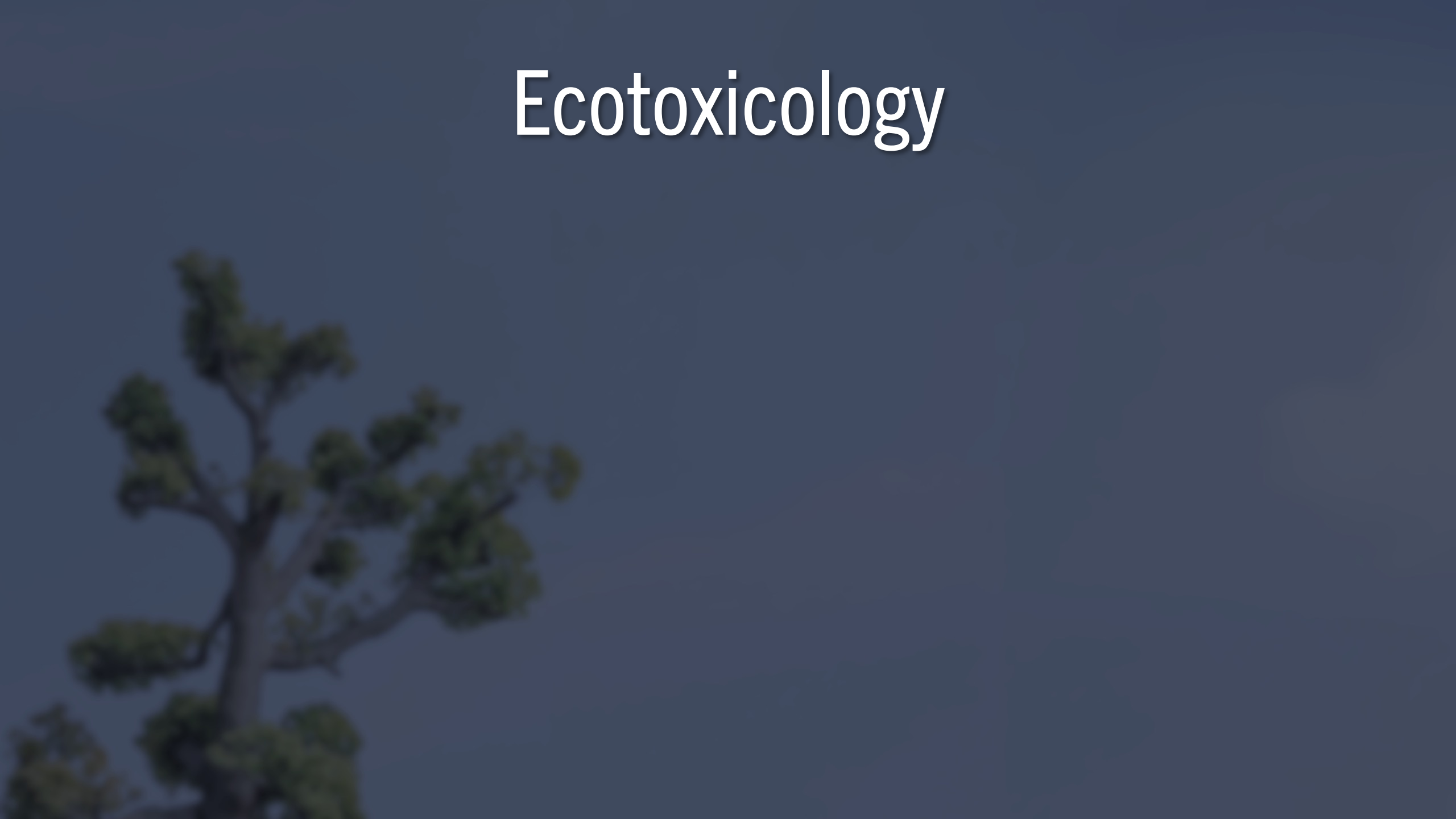
Evolutionary Ecology Unit

Hazards for most chemicals are poorly understood



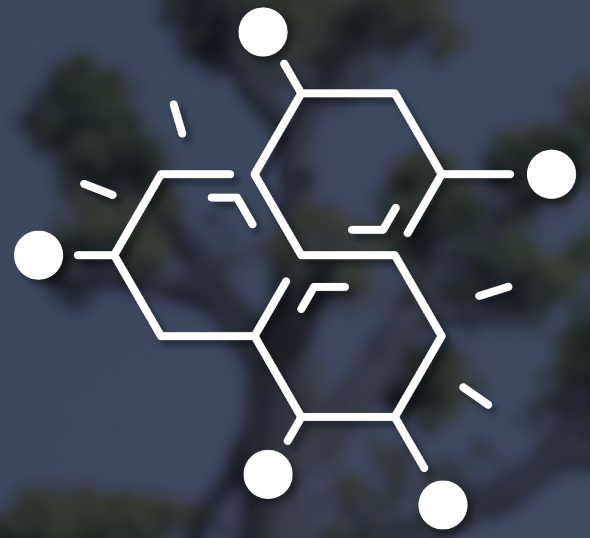
EEA 2020

Ecotoxicology



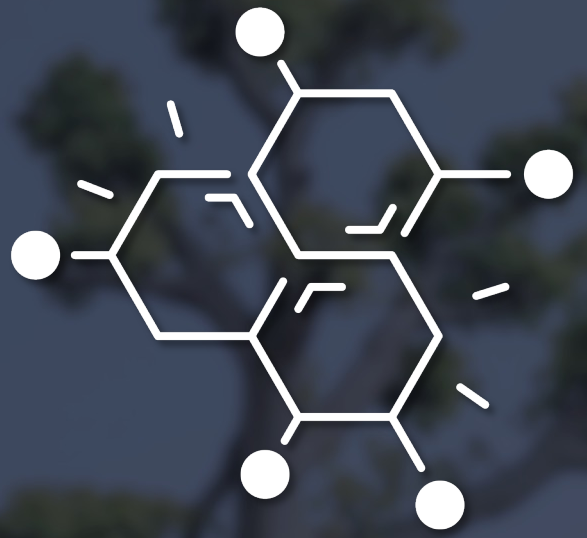
Ecotoxicology

Molecular

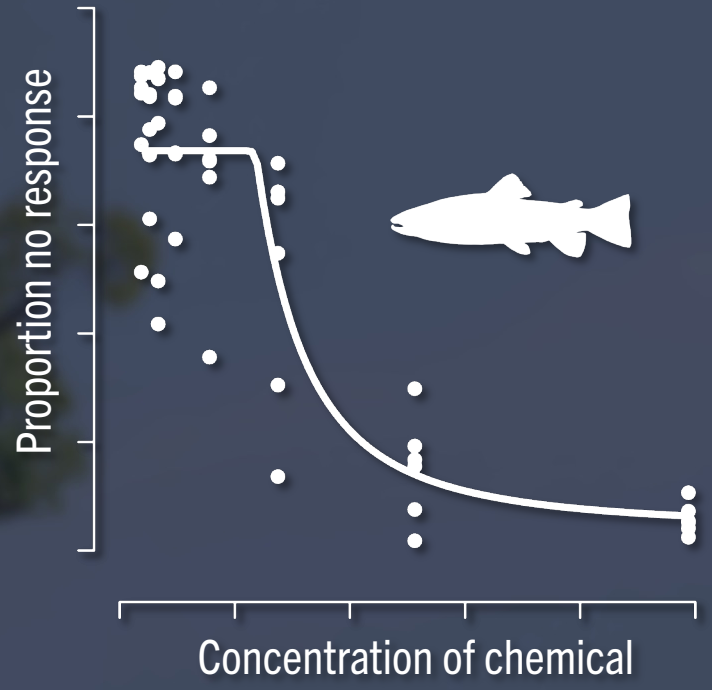


Ecotoxicology

Molecular



Species



Ecotoxicology

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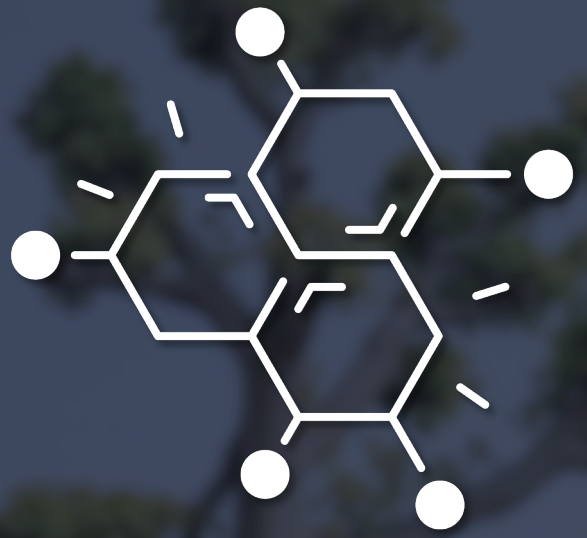

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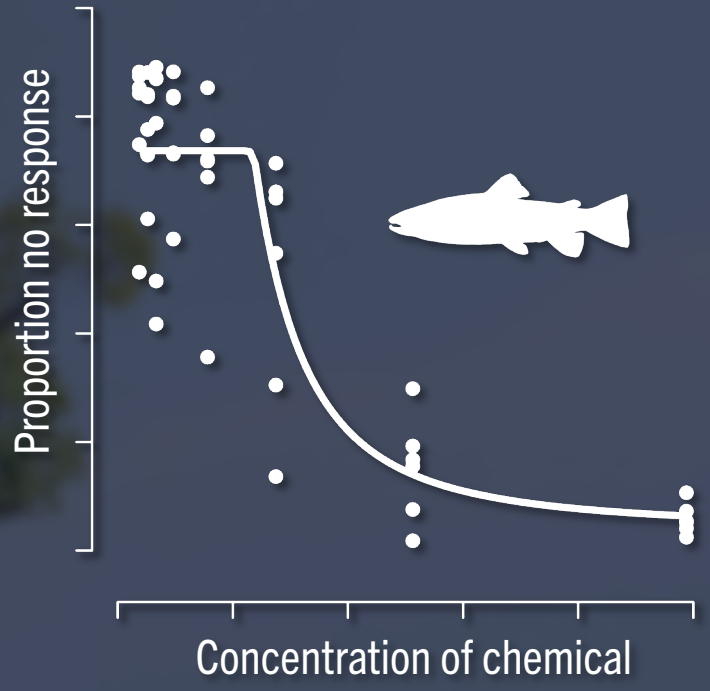
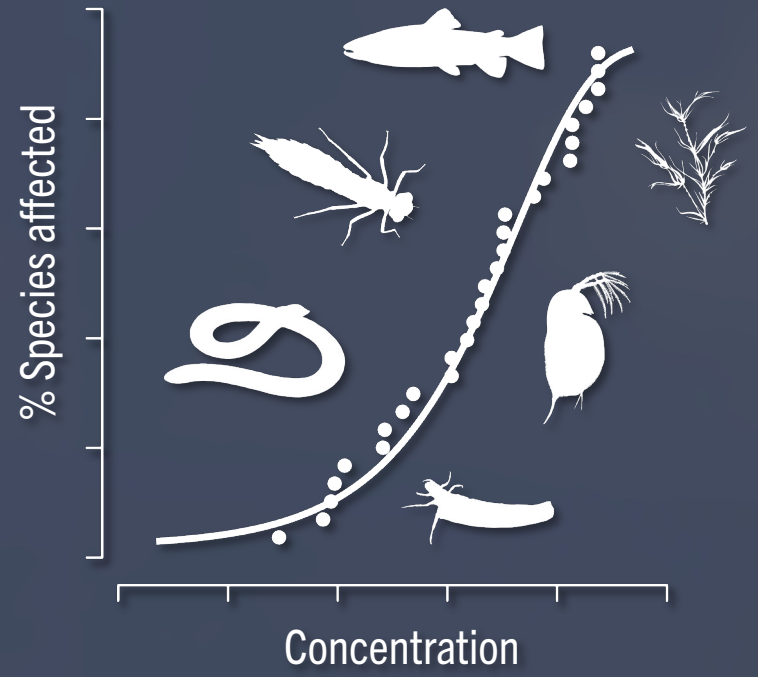
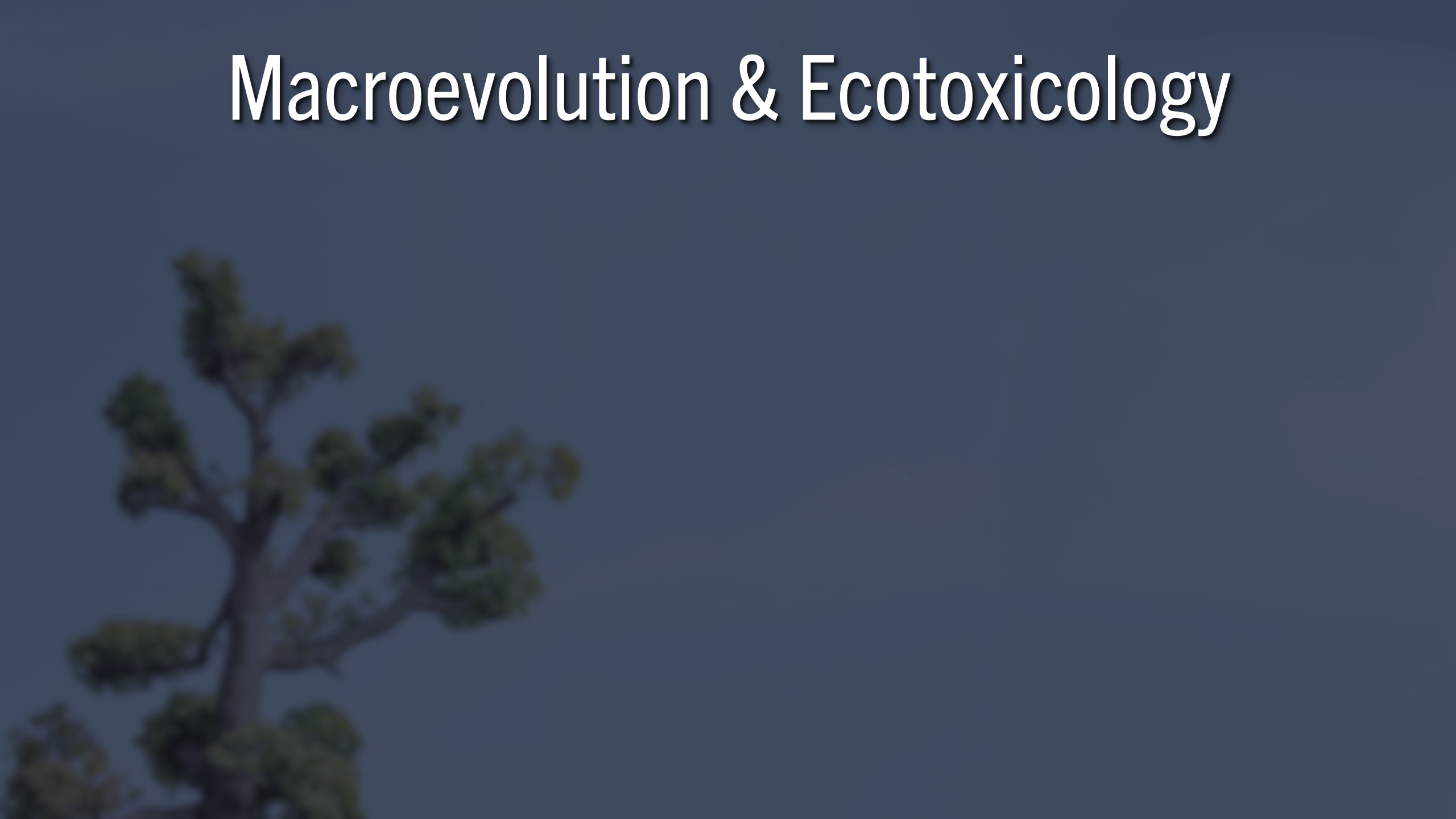


Ecosystem

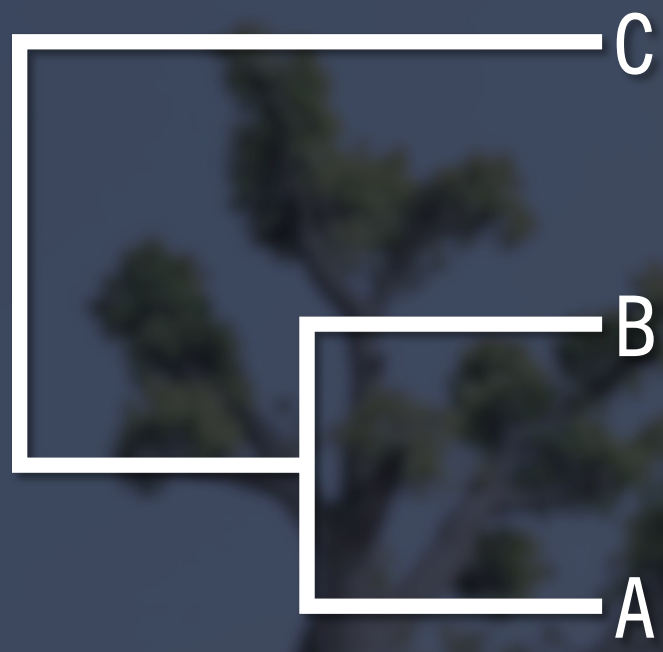


What can an evolutionary perspective add?

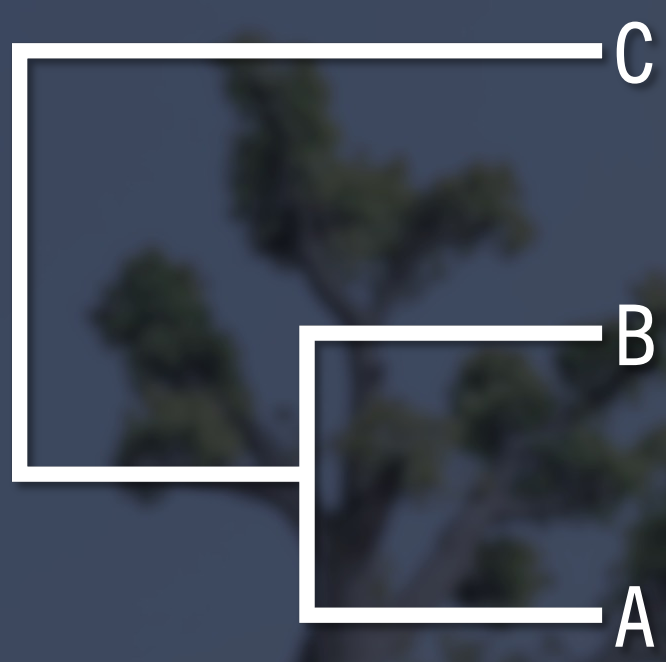
Macroevolution & Ecotoxicology

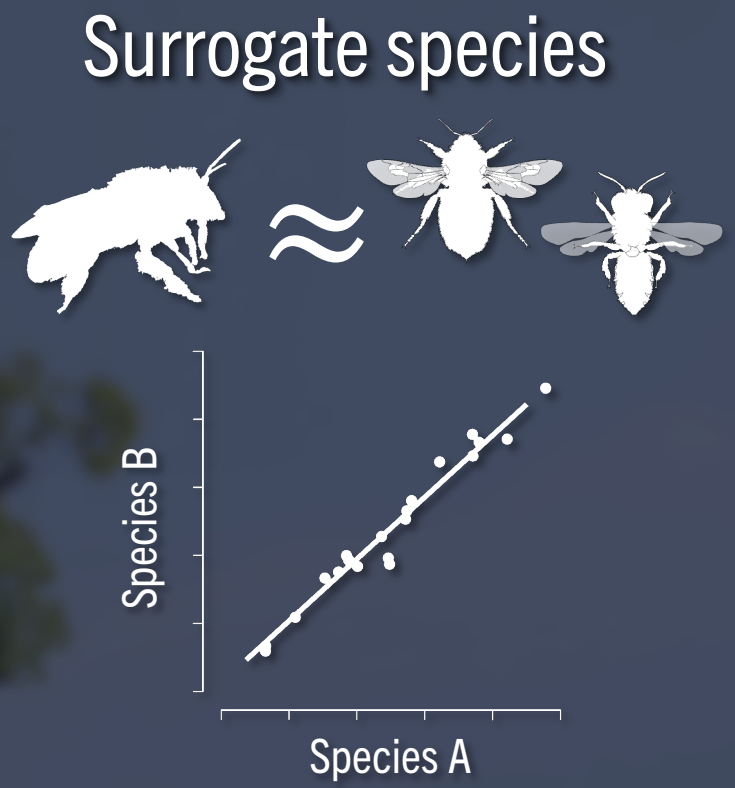


Macroevolution & Ecotoxicology



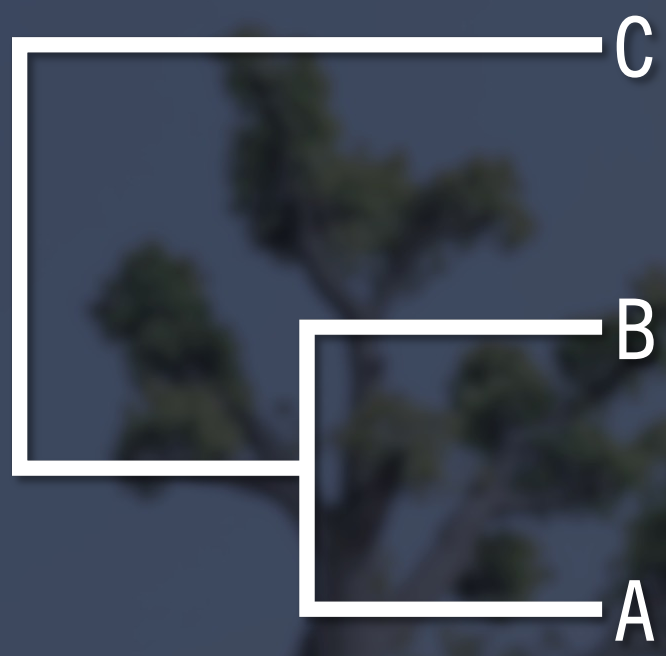
Macroevolution & Ecotoxicology



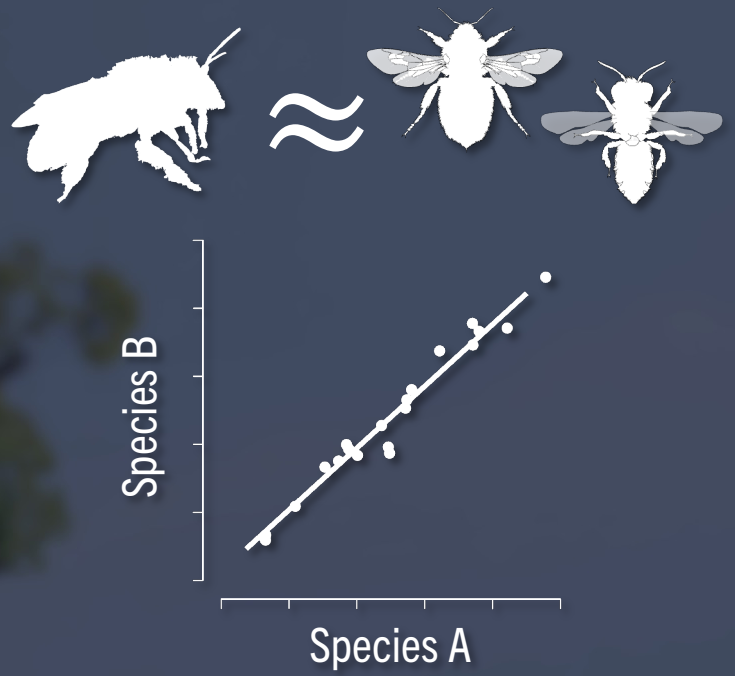


USEPA 2015

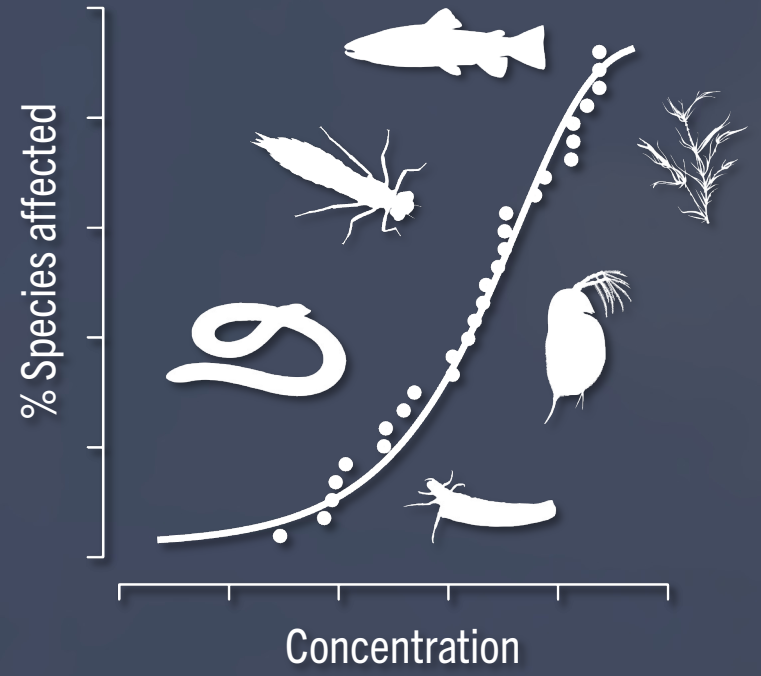
Macroevolution & Ecotoxicology



Surrogate species

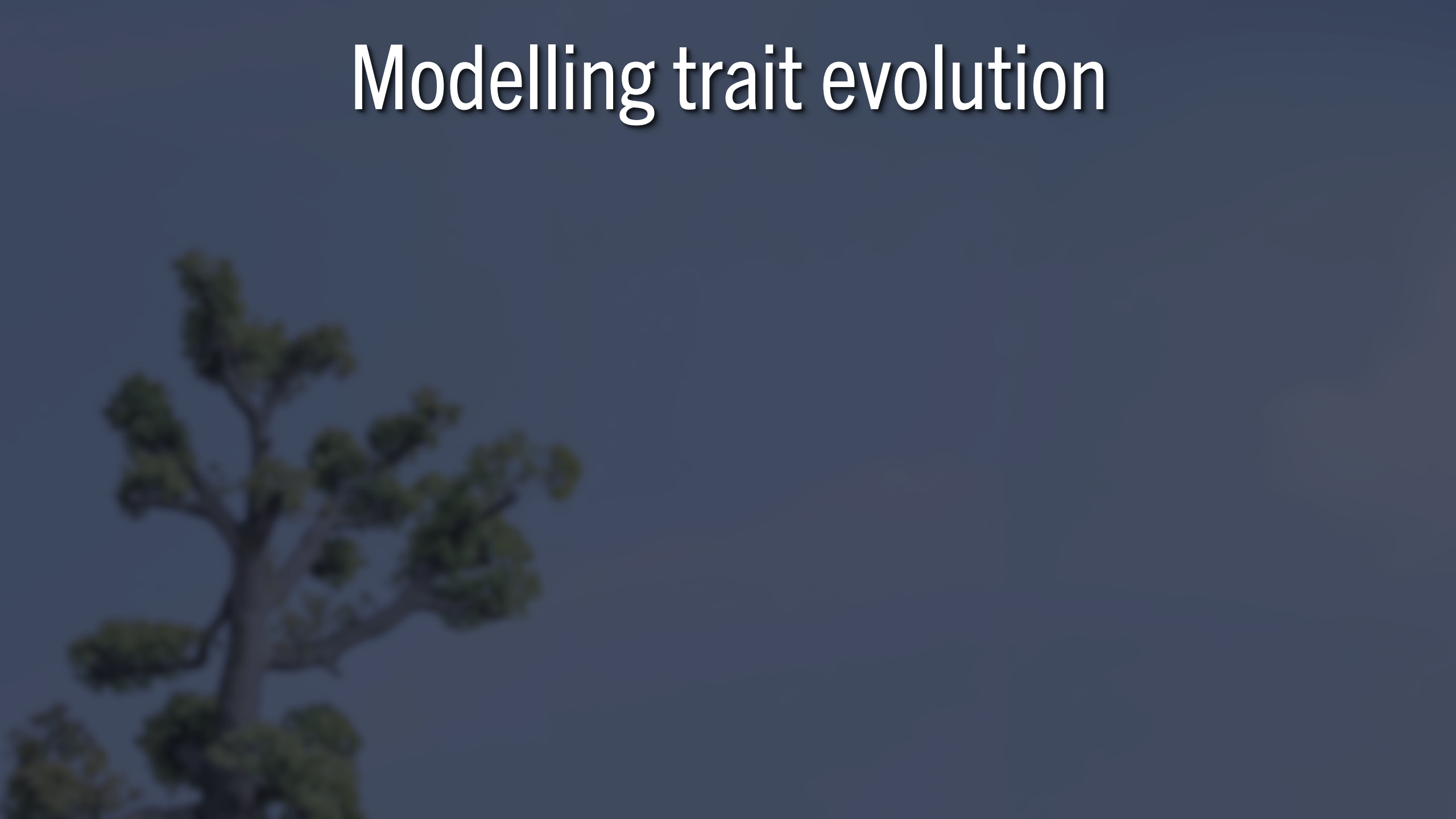


Wide taxanomic diversity



USEPA 2015

Modelling trait evolution



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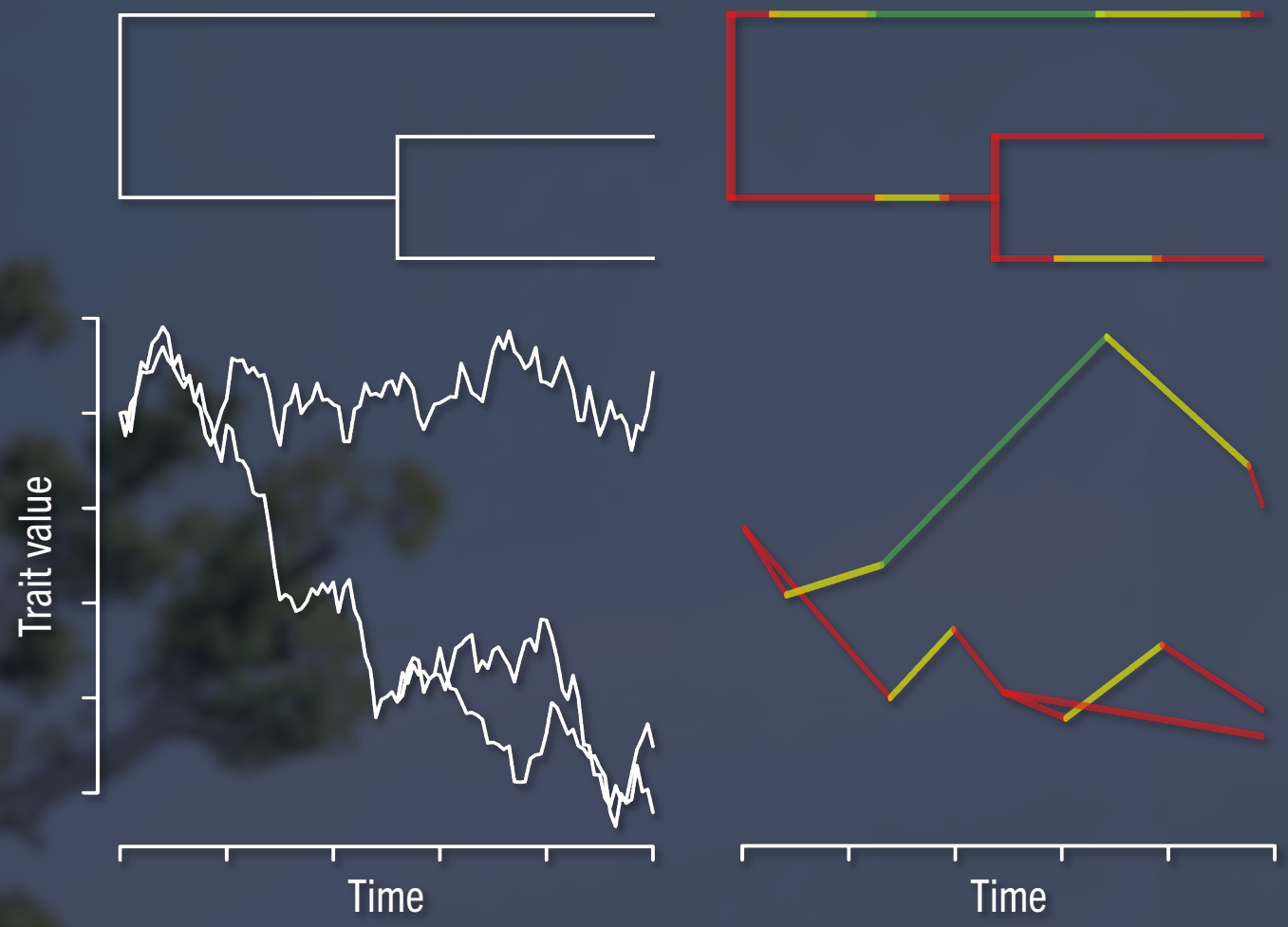
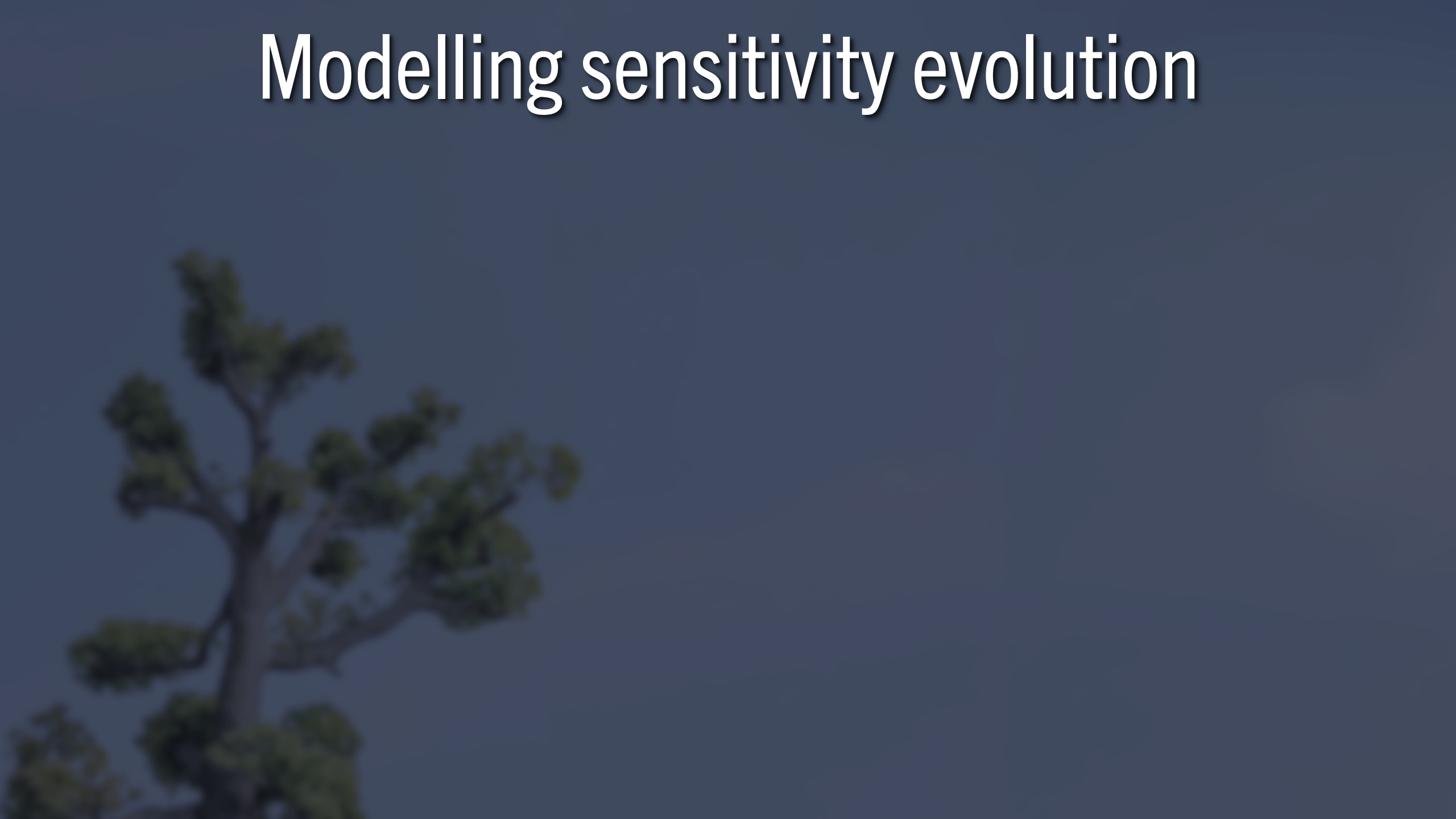


$$dX(t) = \sigma dW(t)$$

$$dX(t) = -\alpha(X(t) - \mu) + \sigma dW(t)$$

Modelling sensitivity evolution



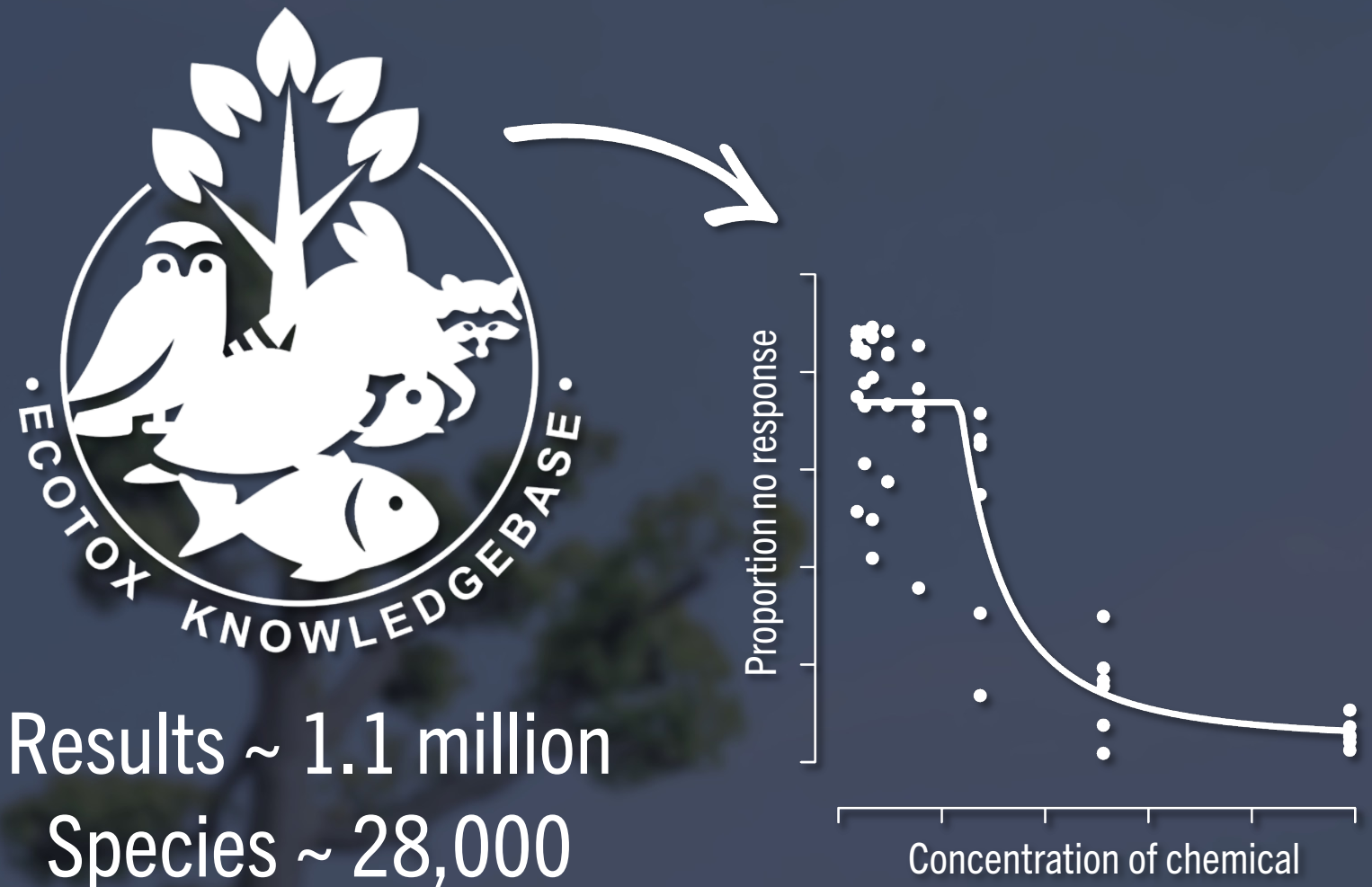
Modelling sensitivity evolution

Results ~ 1.1 million

Species ~ 28,000

Chemicals ~ 17,000

Modelling sensitivity evolution



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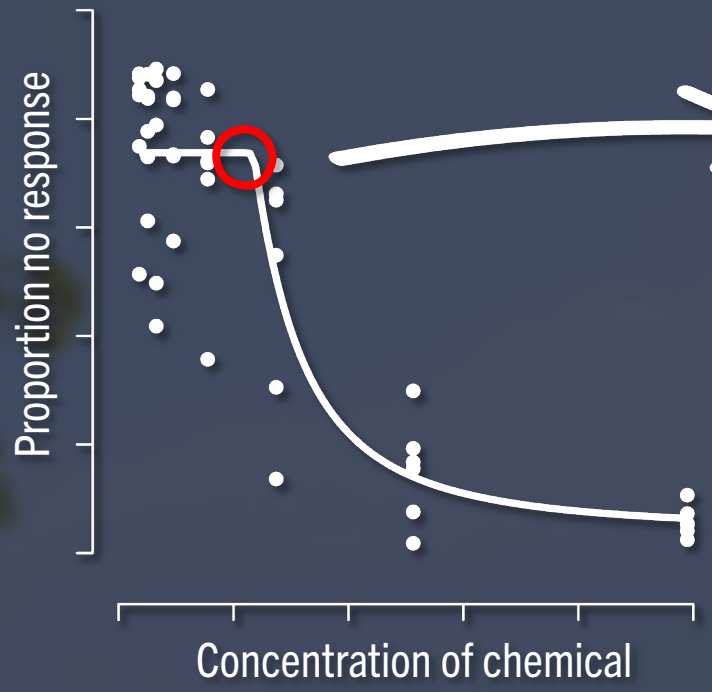
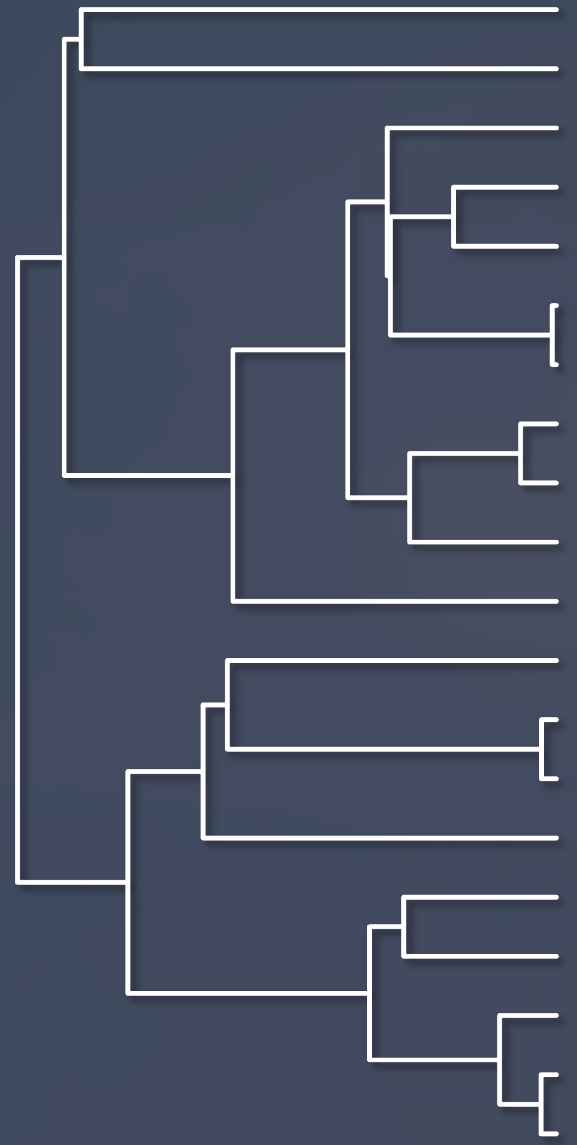
ECOTOX KNOWLEDGEBASE





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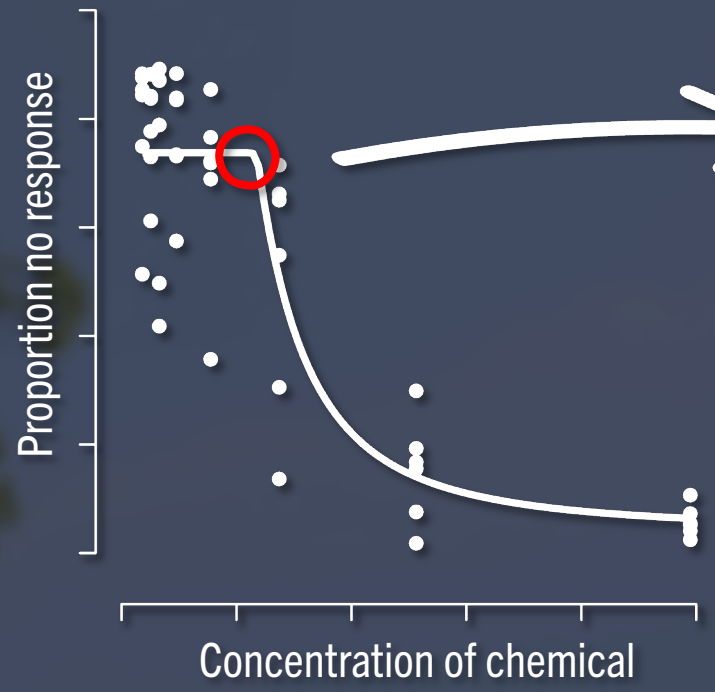

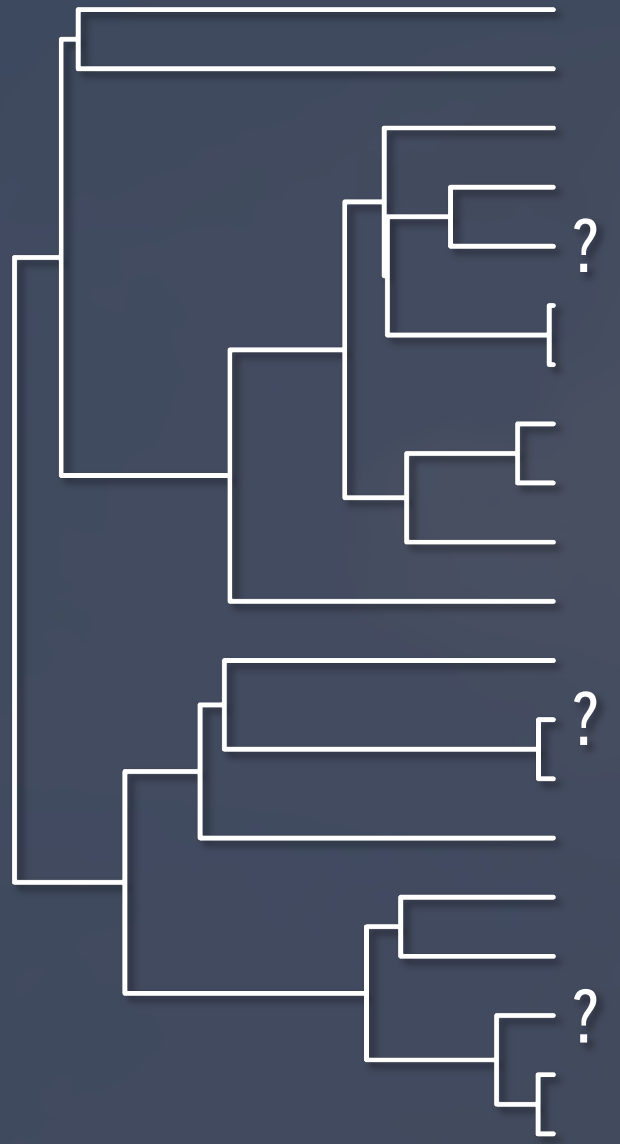

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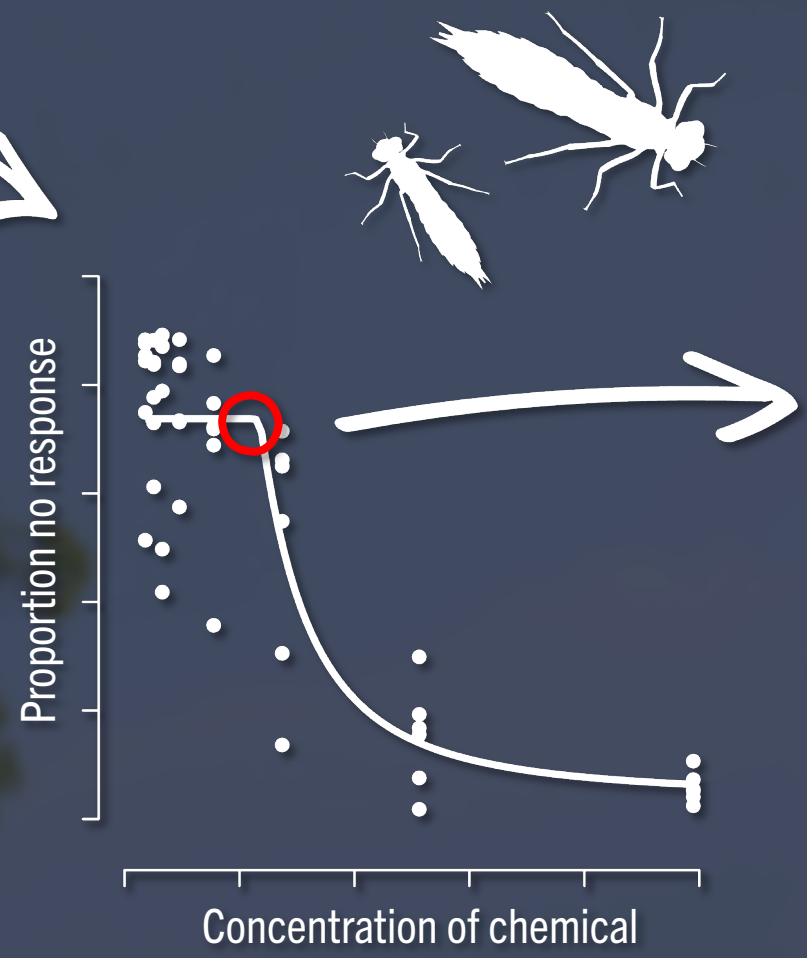

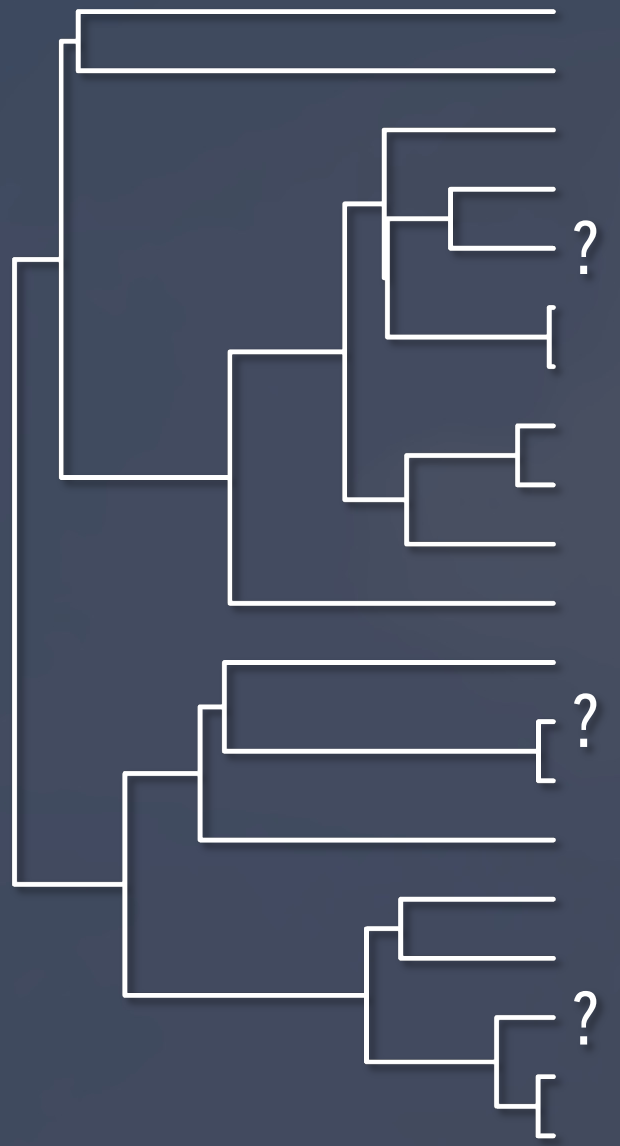

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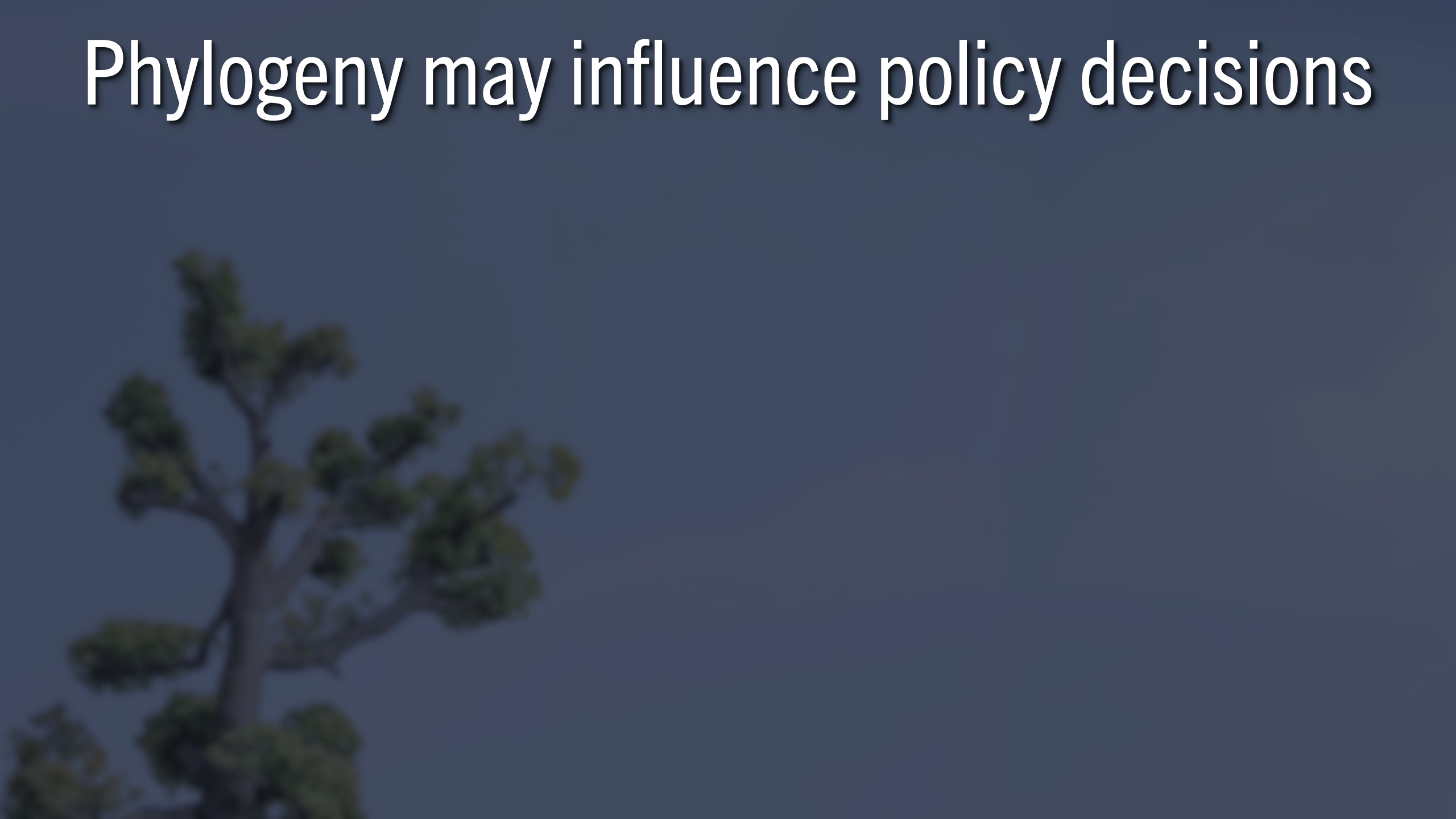
Phylogeny may influence policy decisions



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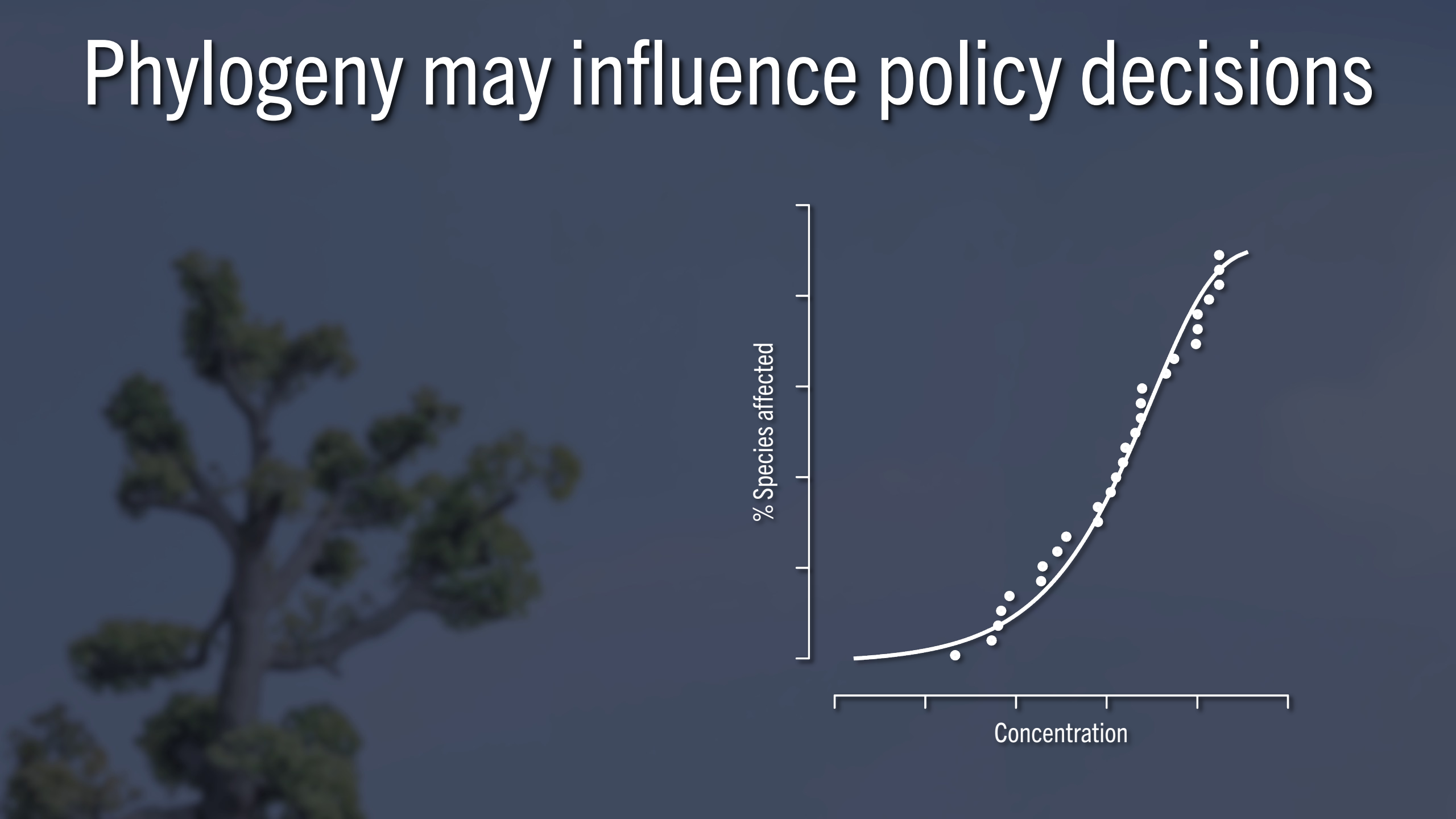

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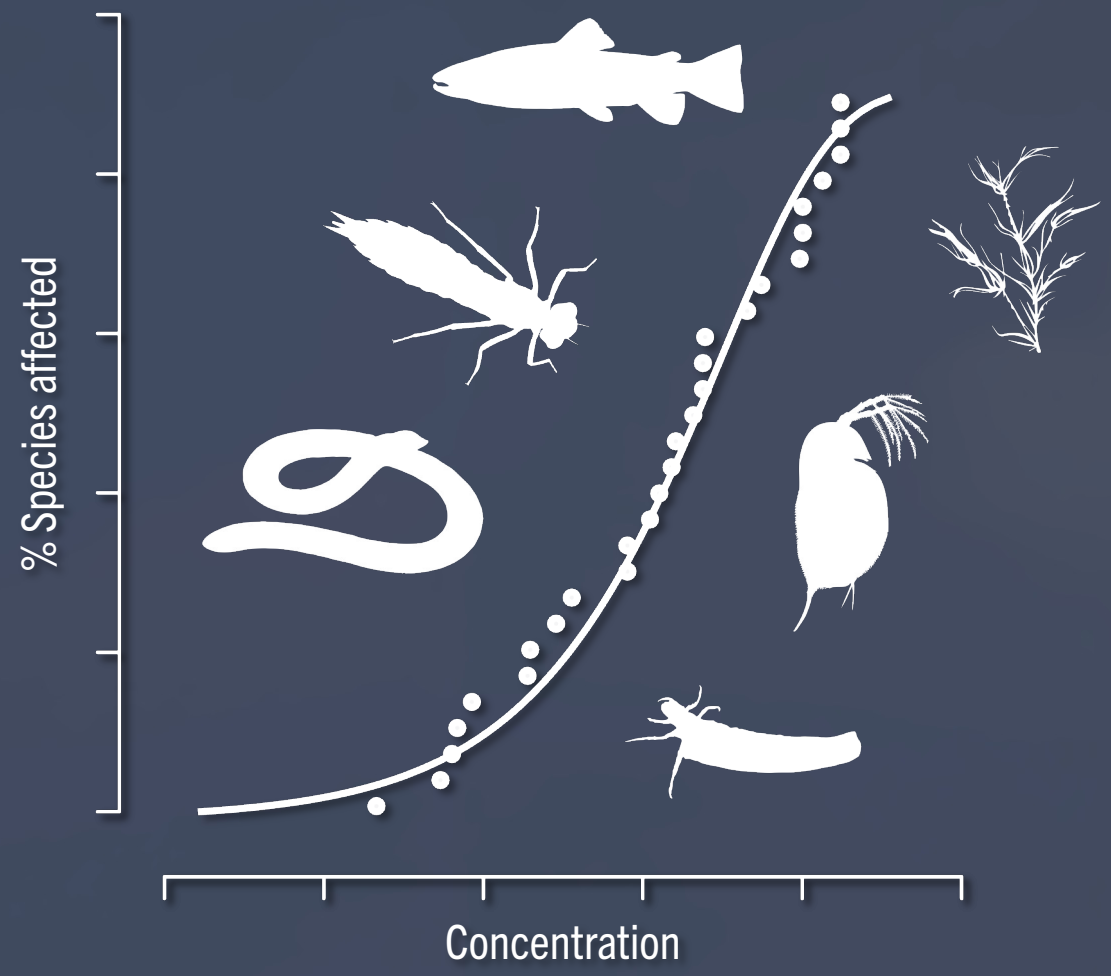

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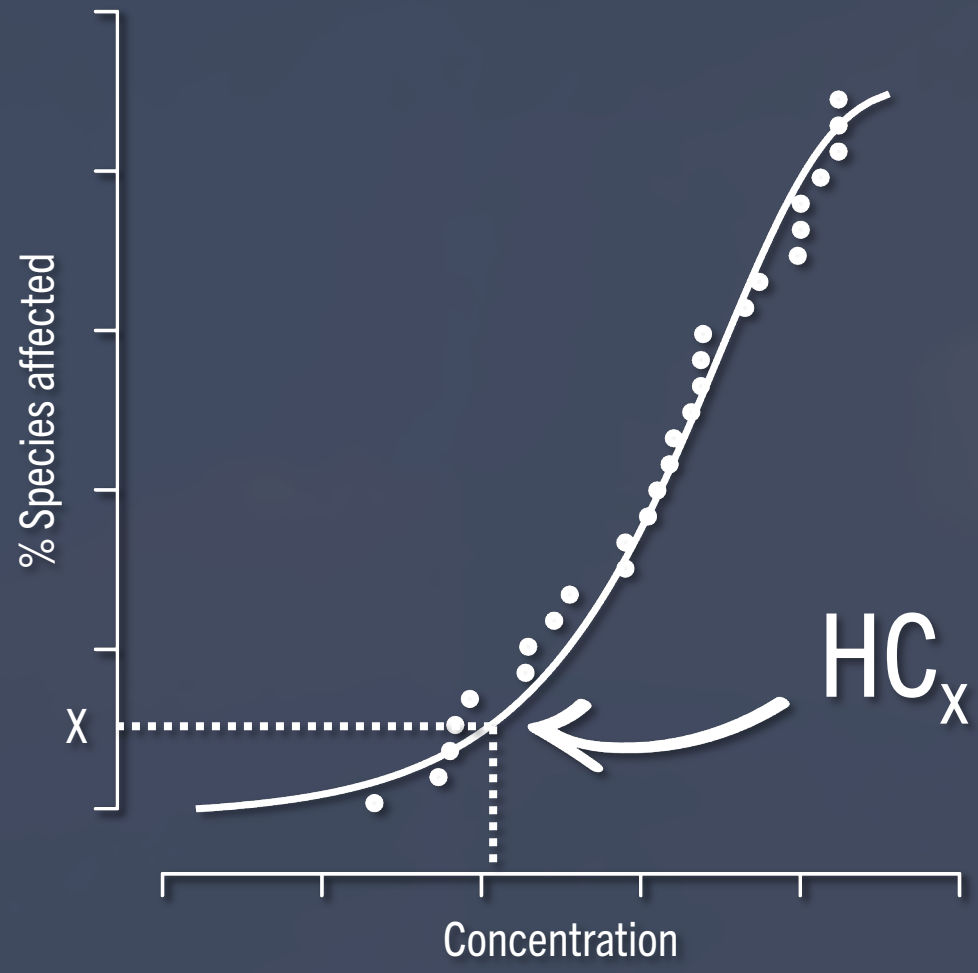

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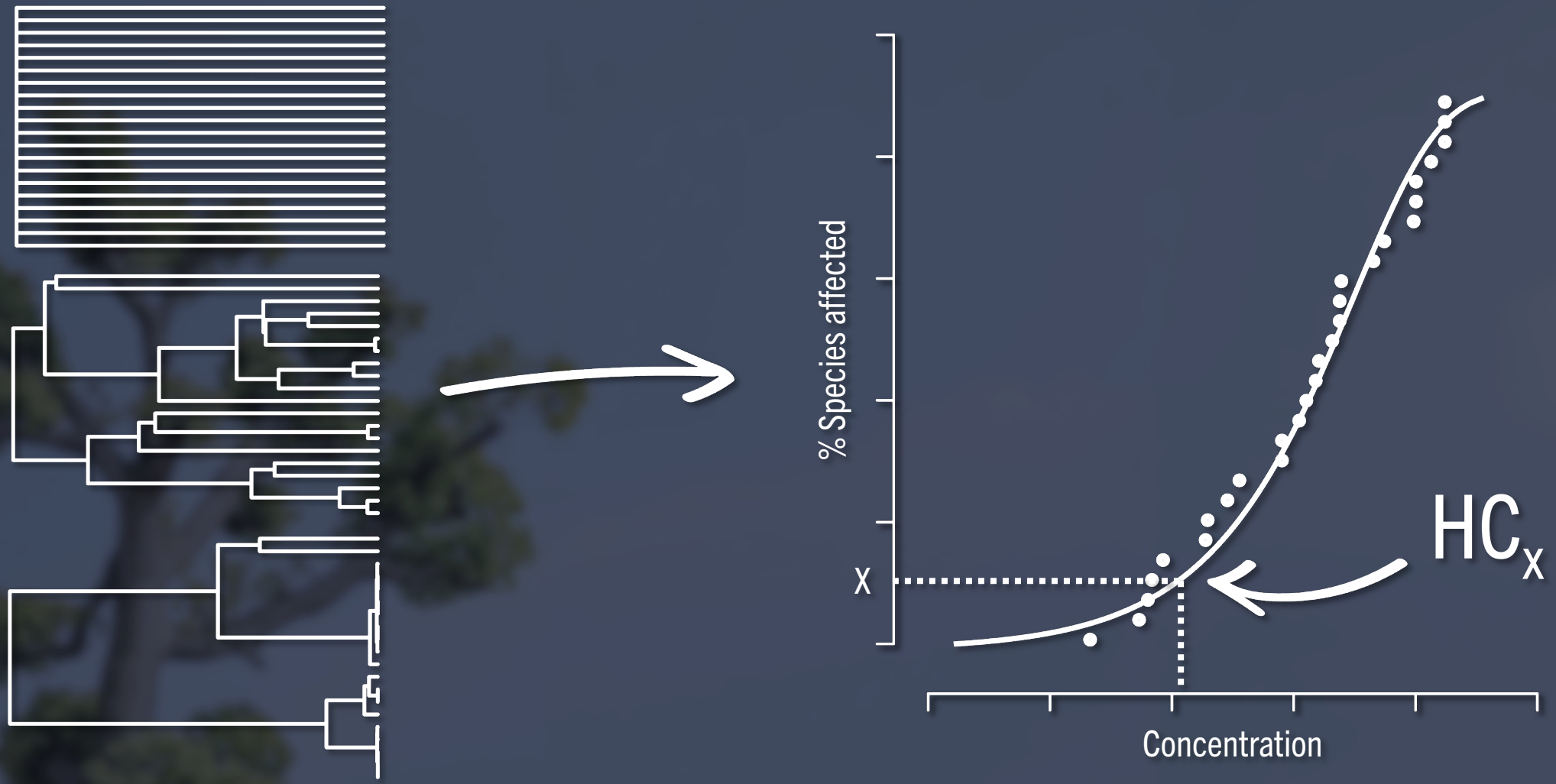

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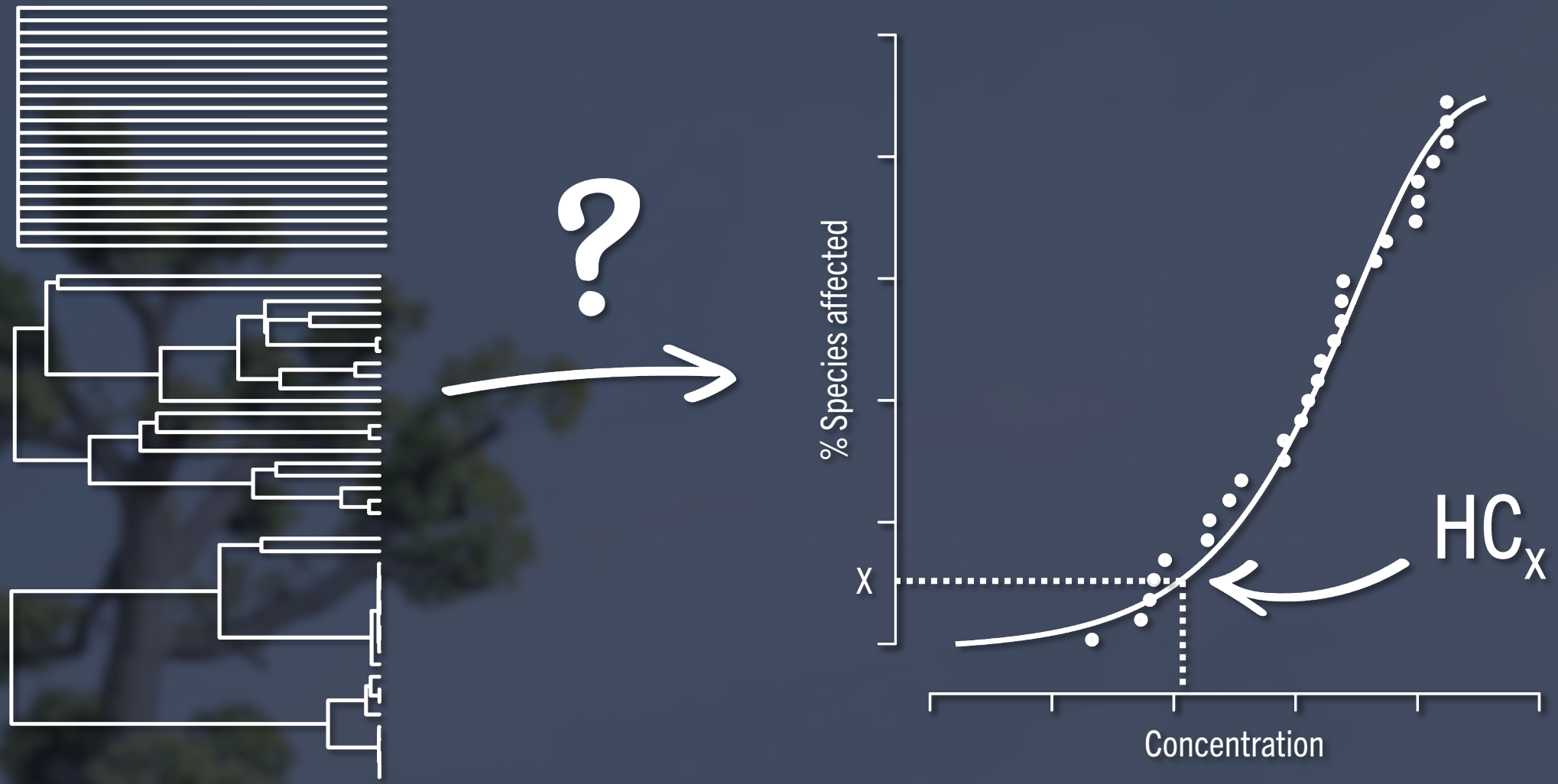

Next time!

Thank you for listening

Iain Moodie

Stephen De Lisle

Erik Svensson

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FORMAS