Why statistics?

To answer questions like. . .

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- does X influence Y? How much?

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- what's the probability that something occurs?
- does X influence Y? How much?
- can we predict Y knowing X, Z... How well?

To ensure correct inferences

Inference

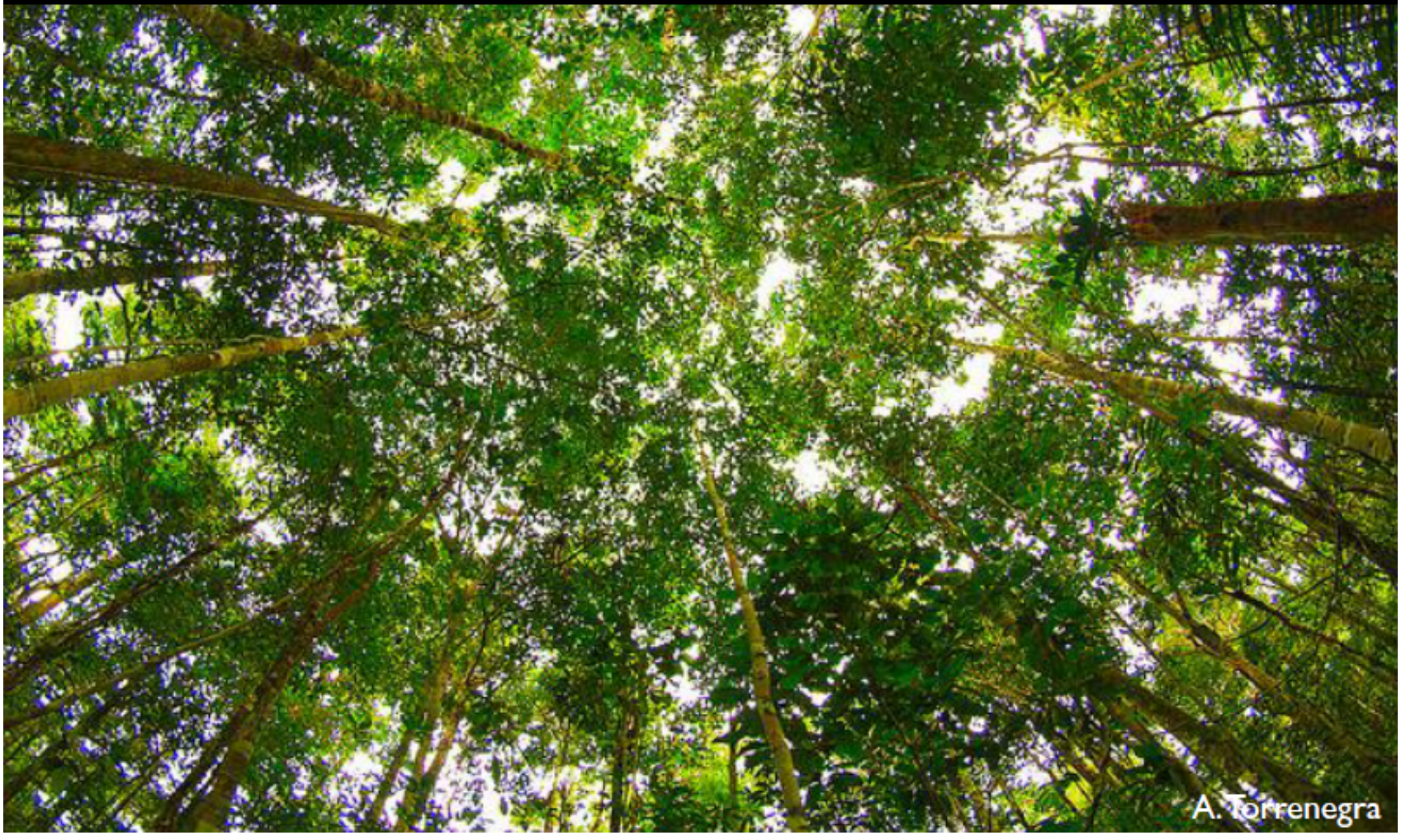
Bolker et al 2009 TREE:

'311 out of 537 GLMM analyses (58%) used these tools inappropriately'

To get answers to tough problems

For example...

How many seeds do trees produce?



Inferring tree fecundity

Course goals

- **Understand** statistical inference

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- Avoid **misconceptions**

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- **Understand** statistical inference
- Avoid **misconceptions**
- Promote **good practices**

The purpose of models is not to fit data but to sharpen thinking

Sam Karlin

Topics

- Descriptive statistics

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- Graphics

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- Descriptive statistics
- Graphics
- Sampling

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- Experimental design

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- Model selection