Models and modelling

Lee Hsiang Liow

Natural History Museum and Centre for Planetary Habitability, University of Oslo, Norway

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Syn-Paleo

FAU **Friedrich-Alexander-Universität Erlangen-Nürnberg**

Natural History Museum

What is a model?
What is the use of a model?

All models are wrong

Some are useful

Different ones are useful under different circumstances

All have assumptions (they are hidden or unexplored sometimes)

Answering questions
     versus
statistics
     versus
programming

Most people are better at one or the other
But I collaborate best when I know a little about something my friend knows a lot about

Answering questions
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What kinds of questions do we (paleobiologists) ask?

Some typical questions

- How does ecological/phylogenetic/taxonomic richness through time & space and why?

- How and why do different morphological forms evolve when they do?

- How slow/fast does evolution act?

- Can we predict evolution (extinction, speciation, changes in morphology/other phenotypics)

Range-through diversity as an example

- White board

Assumptions assumptions assumptions

- We make assumptions and "quick" judgement everyday

- Should we do that in asking science questions?

- Do we want to know "the truth" or do we just want to analyze some data without digging any deeper?

- Always (try!) think about data-generating processes (see Rachel's lecture notes!)