



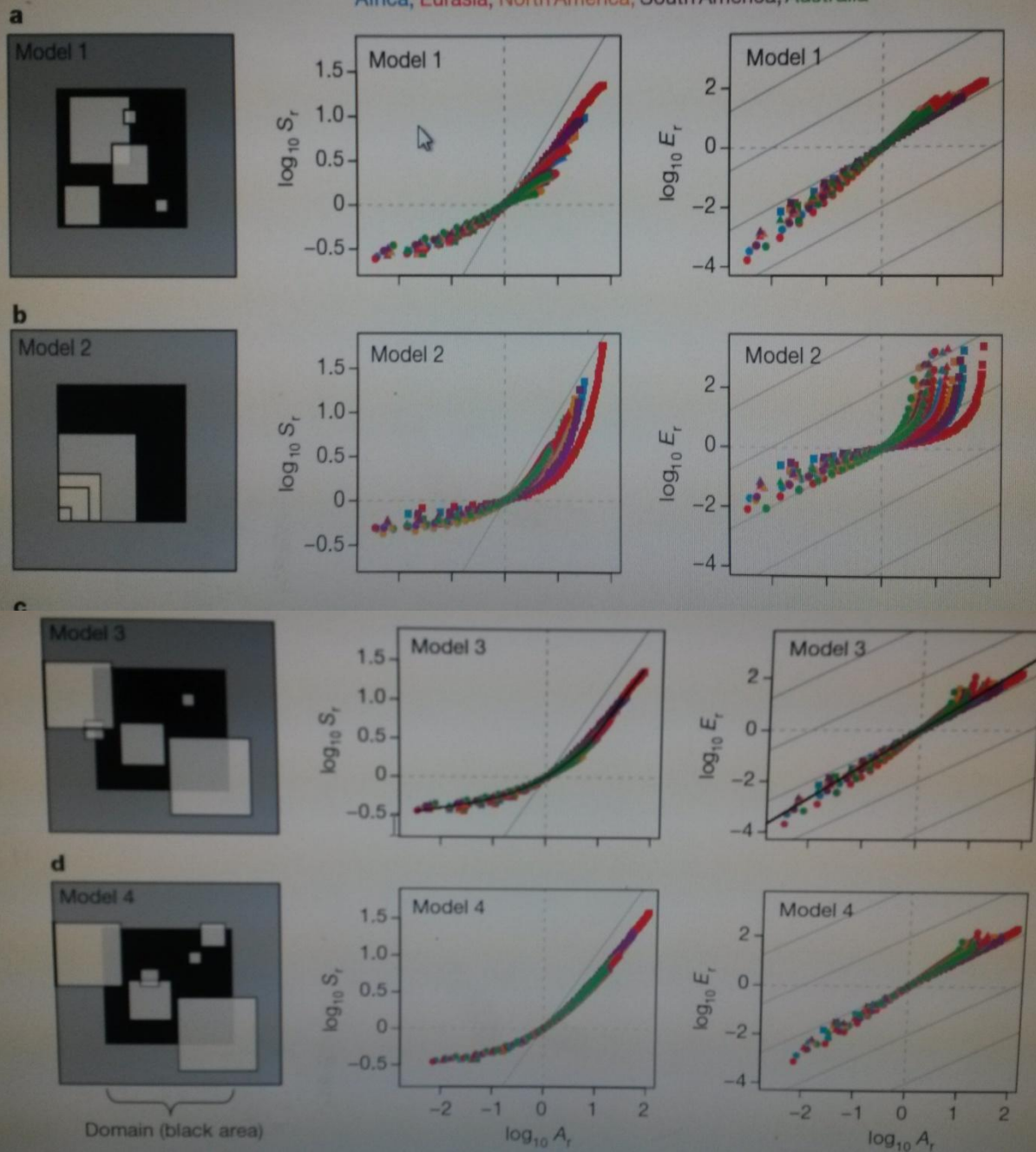
# **UNIVERSAL SPECIES -AREA AND ENDEMICS—AREA RELATIONSHIPS AT CONTINENTAL SCALES**

**By: David Storch, Petr Keil & Walter Jetz**

- The relevance of how the number of species or endemics change with area and endemics-area relationships is broad, but understanding of the universality and pervasiveness of the patterns across taxa is limited.
- Traditionally this relationship was approximated by a power law, but recent theories predict a triphasic Species Area Relationship (SAR) in logarithmic space characterized by steeper increases in species richness at both small and large spatial scales



□ Amphibians, ○ Birds, △ Mammals  
 Africa, Eurasia, North America, South America, Australia



## RESCALED SARs AND EARs PREDICTED BY FOUR SIMULATION MODELS OF RANGE PLACEMENT.

Range sizes were drawn from the empirical frequency distributions of each taxon and domain (black areas in Supplementary Fig. 3) and were placed into a domain with a size equal to that of the regions analysed for the original SARs and EARs using the strictly nested quadrat design (Supplementary Fig. 3 and Methods; for the results based on the regions analysed using the continent shape design see Supplementary Fig. 12). a, Model 1 is based on a random placement of square ranges within the domain, producing a higher concentration of range midpoints in the centre of the domain (mid-domain effect<sup>30</sup>). b, Model 2 places all the square ranges in a corner of the domain, to illustrate the role of non-random range position. c, Model 3 is based on a random placement of square ranges but minimizes the mid-domain effect by allowing model ranges to overlap the domain only partly. The observed frequency distribution of range sizes is retained, but resulting range shapes within the domain become variable. d, Model 4 is similar to model 3 and completely avoids the mid-domain effect but does not retain the originally observed range size distribution (see Methods for details). We produce a fitted line for model 3 results to highlight its match with the empirical patterns (see Fig. 2): black lines represent the Lowess regression line for the rescaled SAR plot (smoothing span 0.2) and the linear regression line for the rescaled EAR plot. Solid grey lines all have slope of 1.

# REFERENCES

- David Storch, Petr Keil & Walter Jetz. (2012) Universal species–area and endemics–area relationships at continental scales. *Nature*. Volume 488. doi:10.1038/nature11226.

