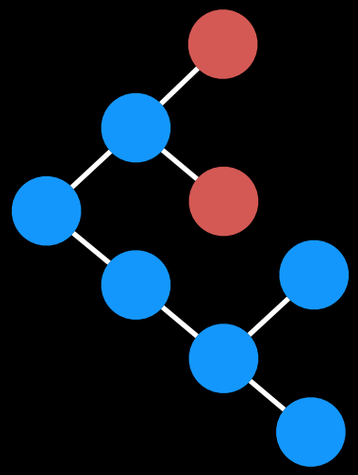
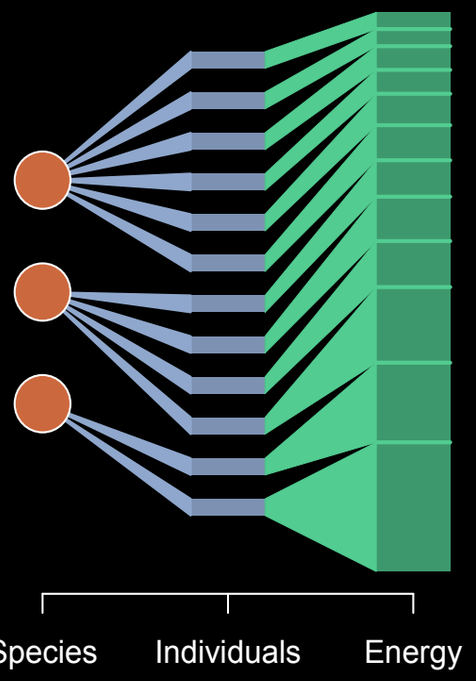
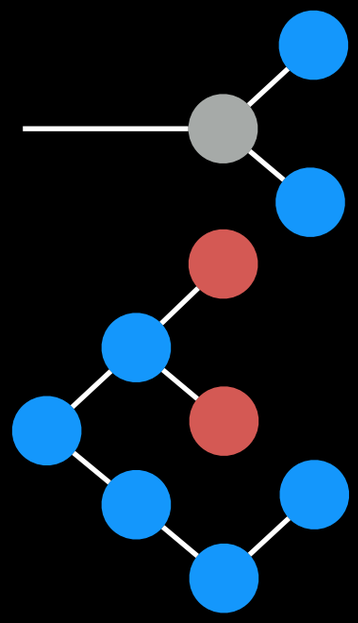
Are the general “laws” in ecology robust to changes in scale?



$$S_{rel} = -\sum_n p(n) \log \frac{p(n)}{p_0(n)}$$



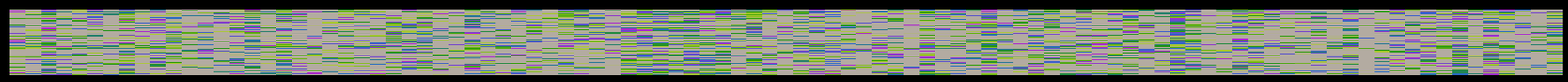


Andy Rominger

JSMF-SFI Postdocs in Complexity Conference II

US Postal Service

$$\frac{dx_i}{dt} = r_i x_i \left(1 - \frac{\sum_{j=1}^{N} \alpha_{ij} x_j}{K_i}\right)$$



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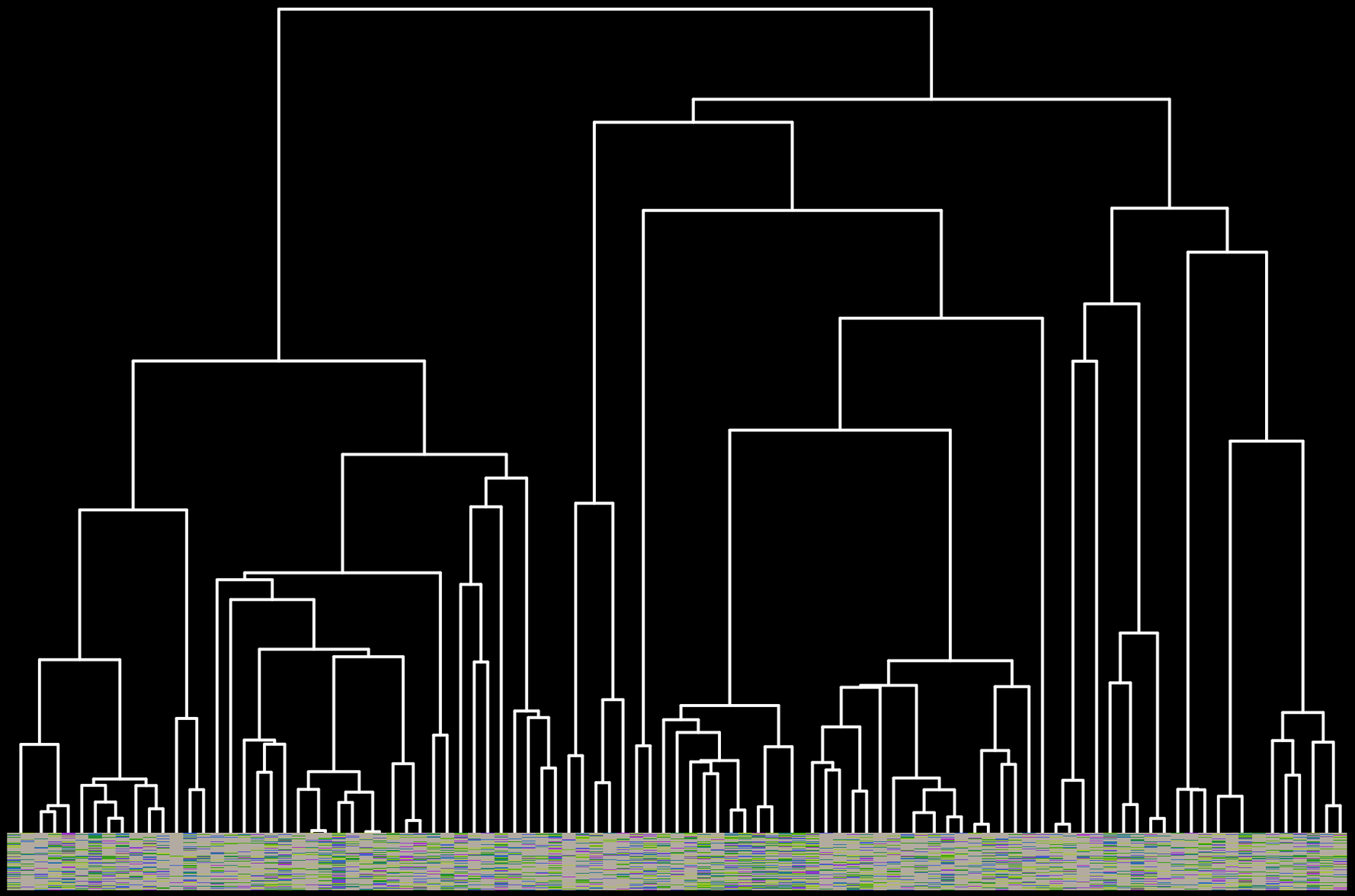
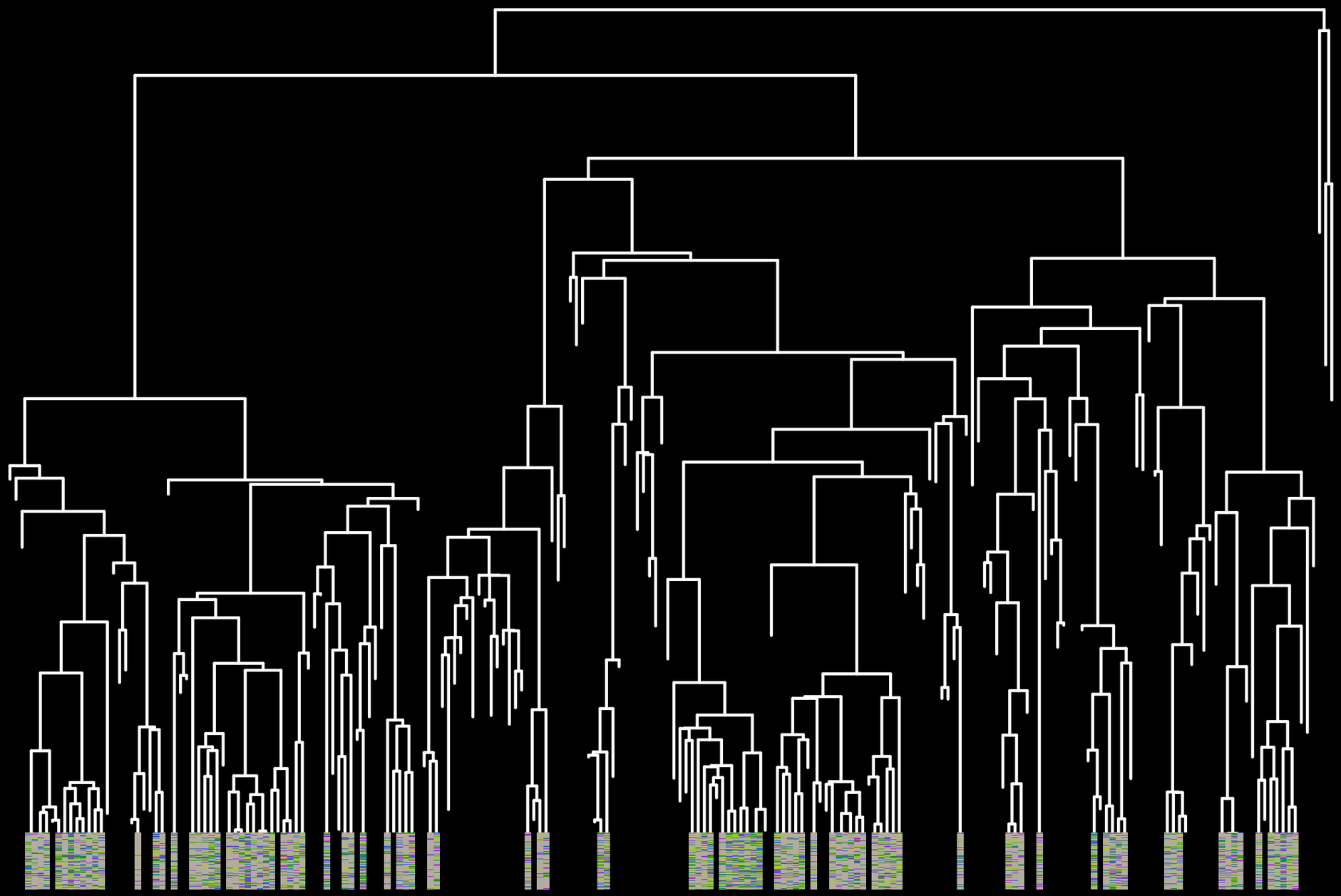
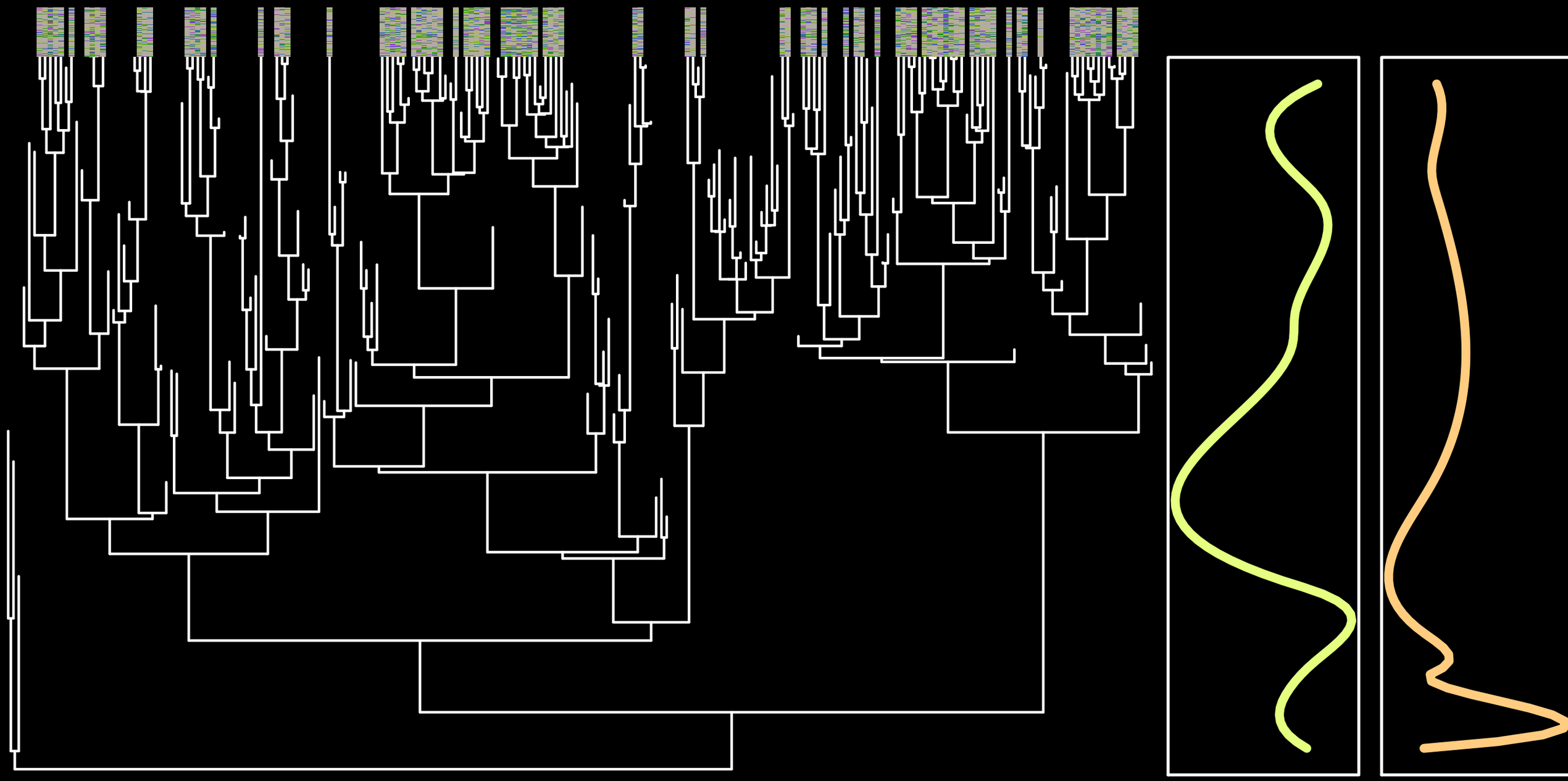
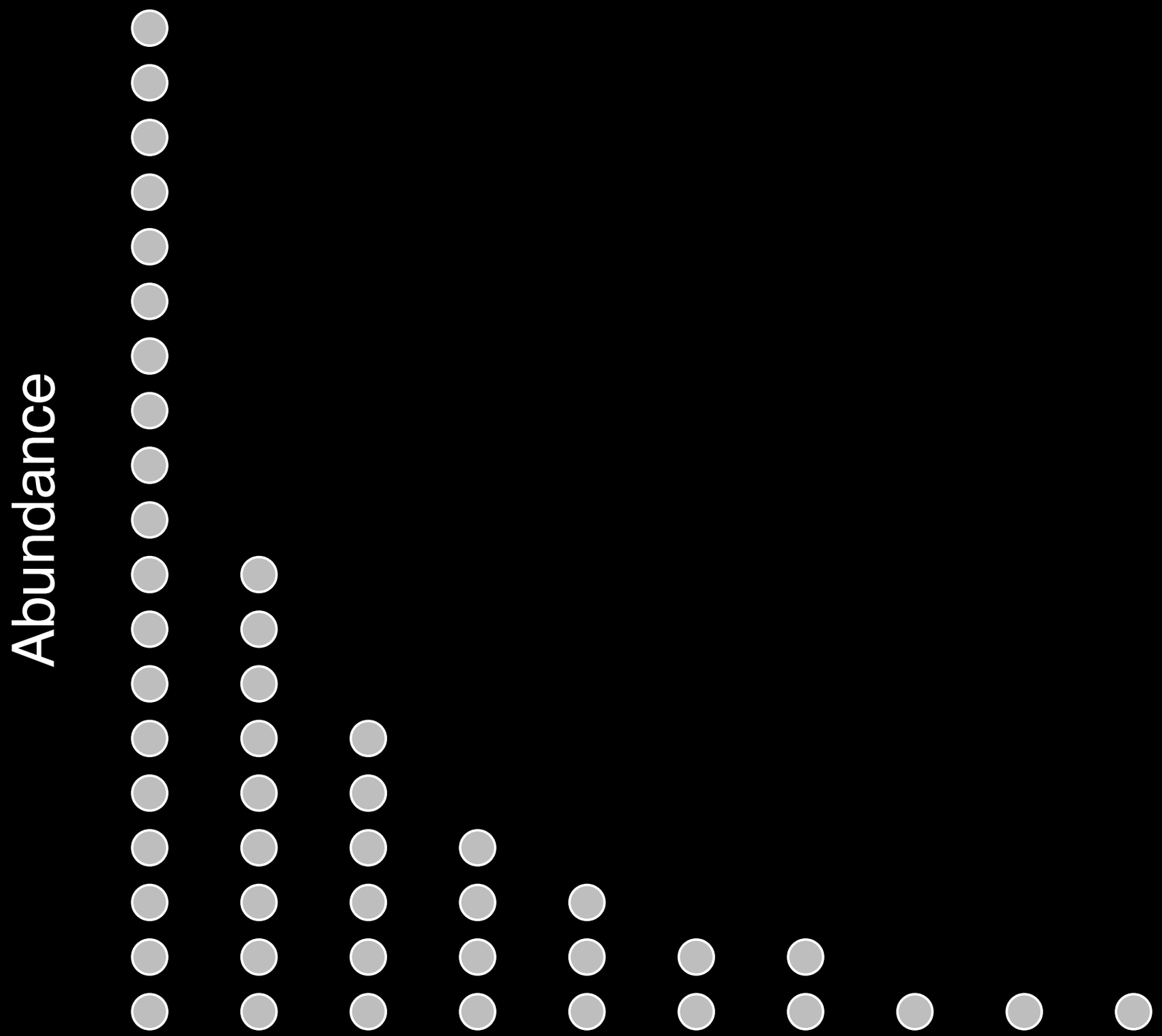
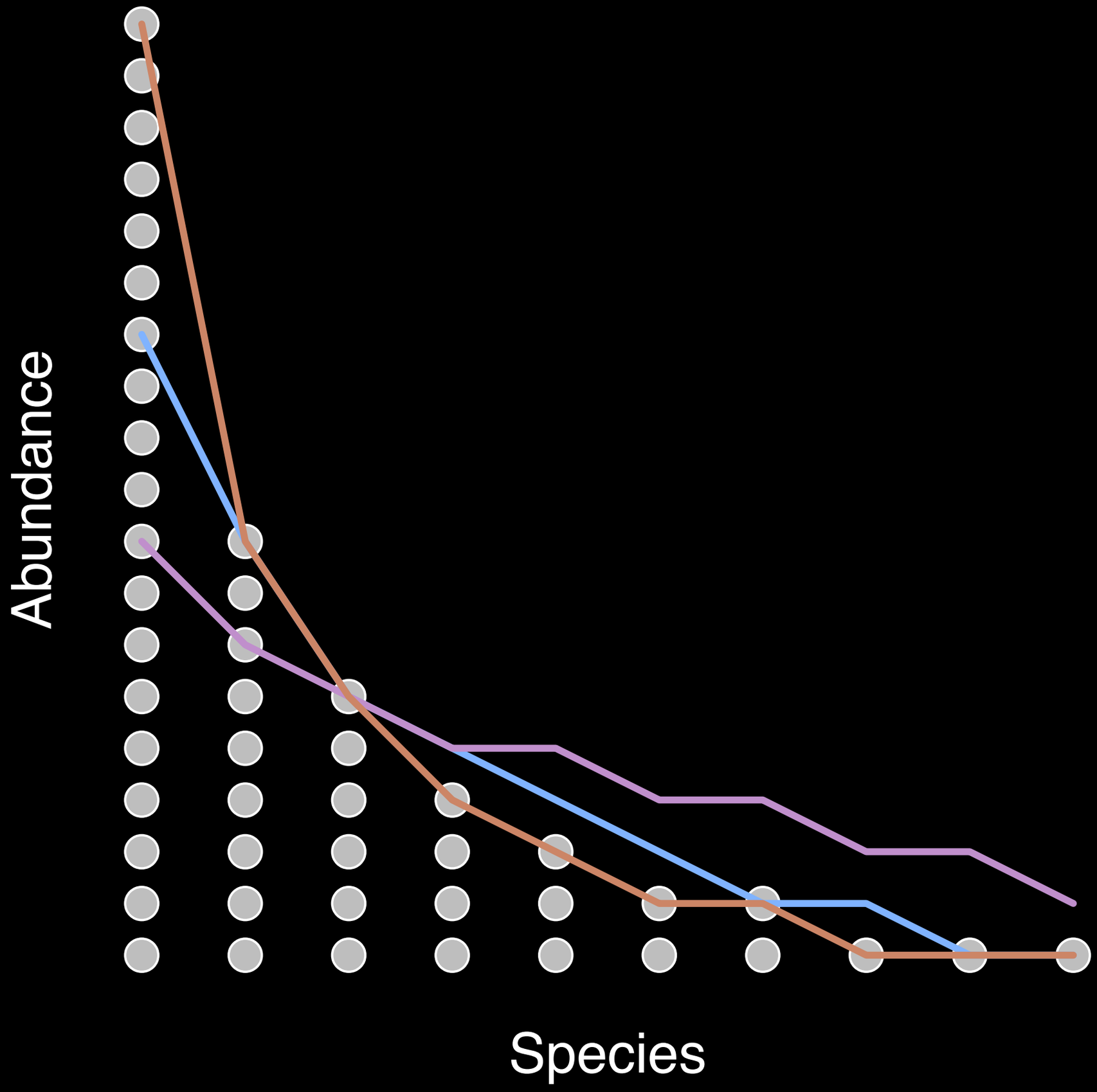


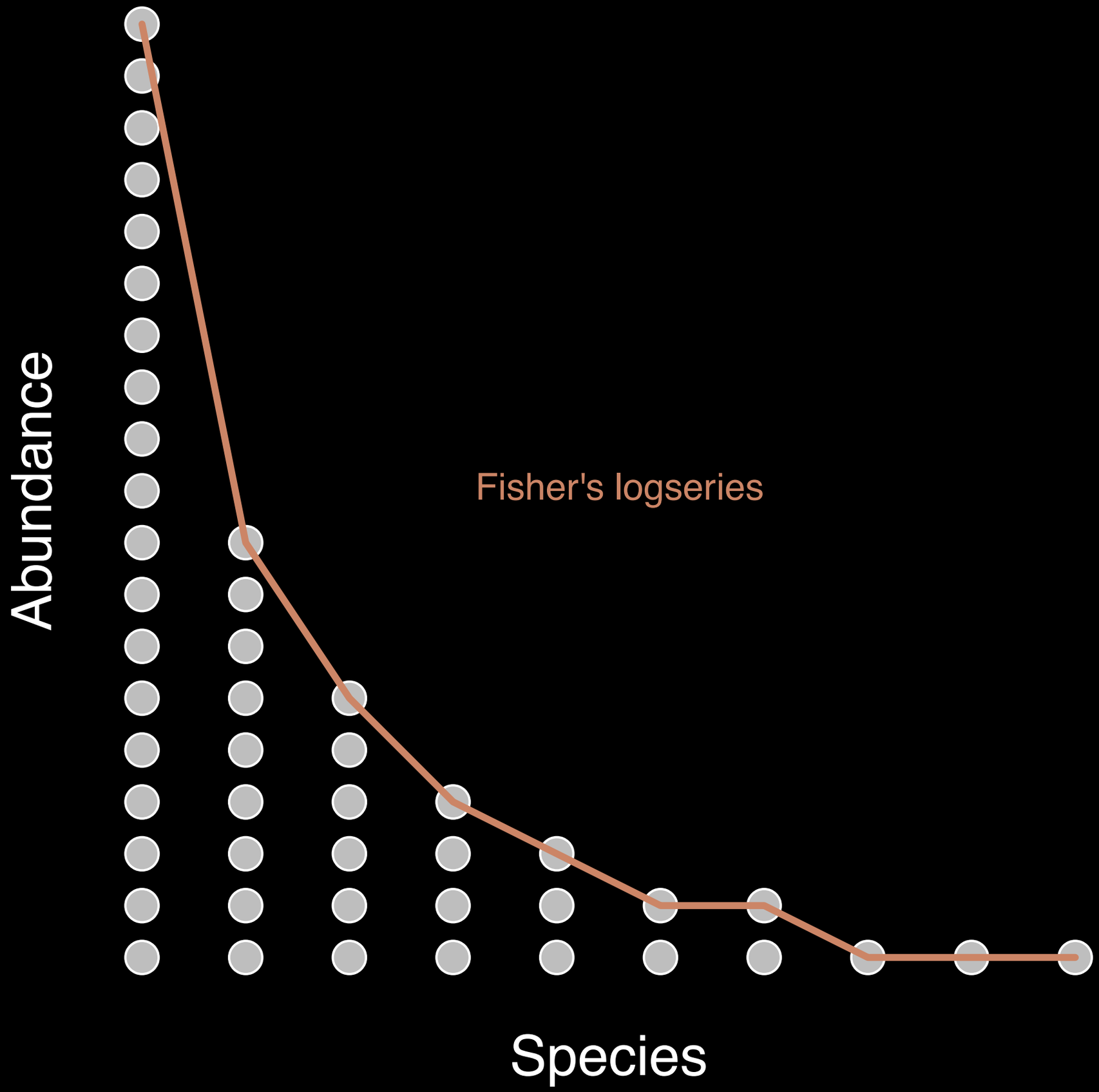


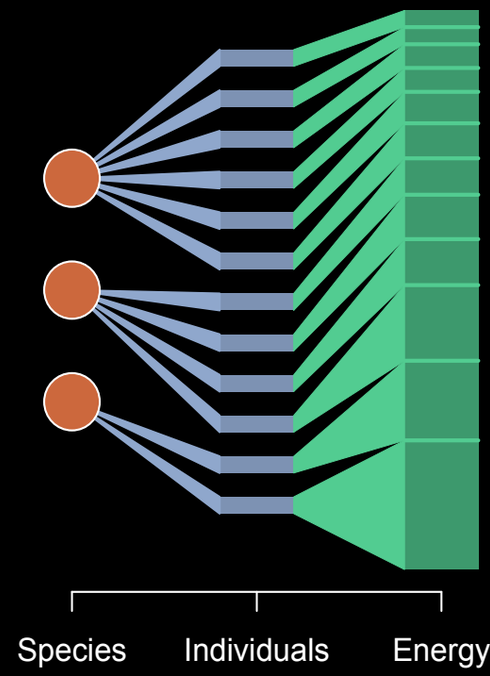

Env1
Env2

US Postal Service

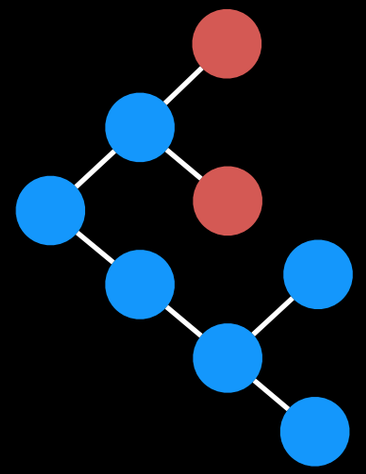

Abundance
Species


Abundance
Species


Abundance
Fisher's logseries
Species

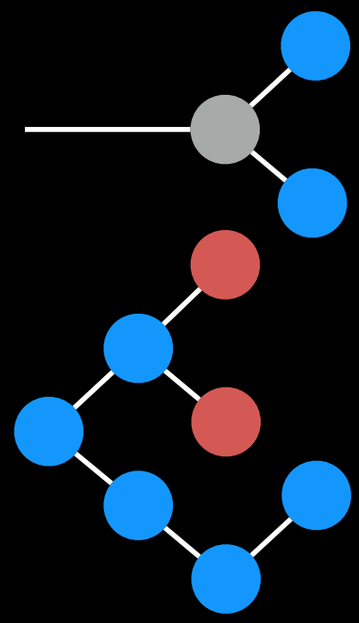


Harte 2011 Oxford U. Press



$$S_{rel} = -\sum_n p(n) \log \frac{p(n)}{p_0(n)}$$

Bowler & Kelly 2012 *Thr. Pop. Biol.*



birth-death-immigration

Kendall 1948 *Biometrika*



Abundance

100

10

1

100

10

1

100

10

1

data

logseries

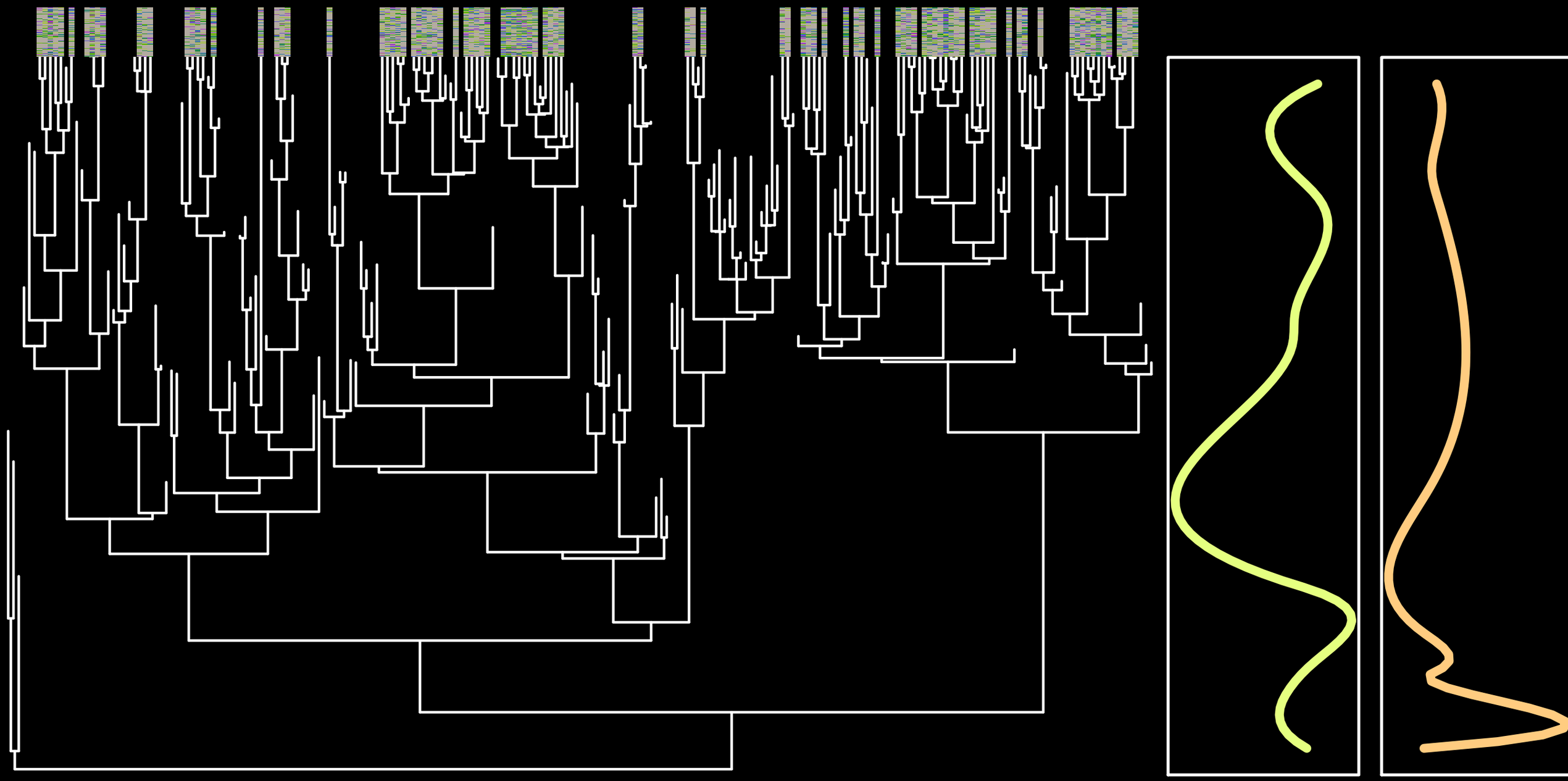
Species rank

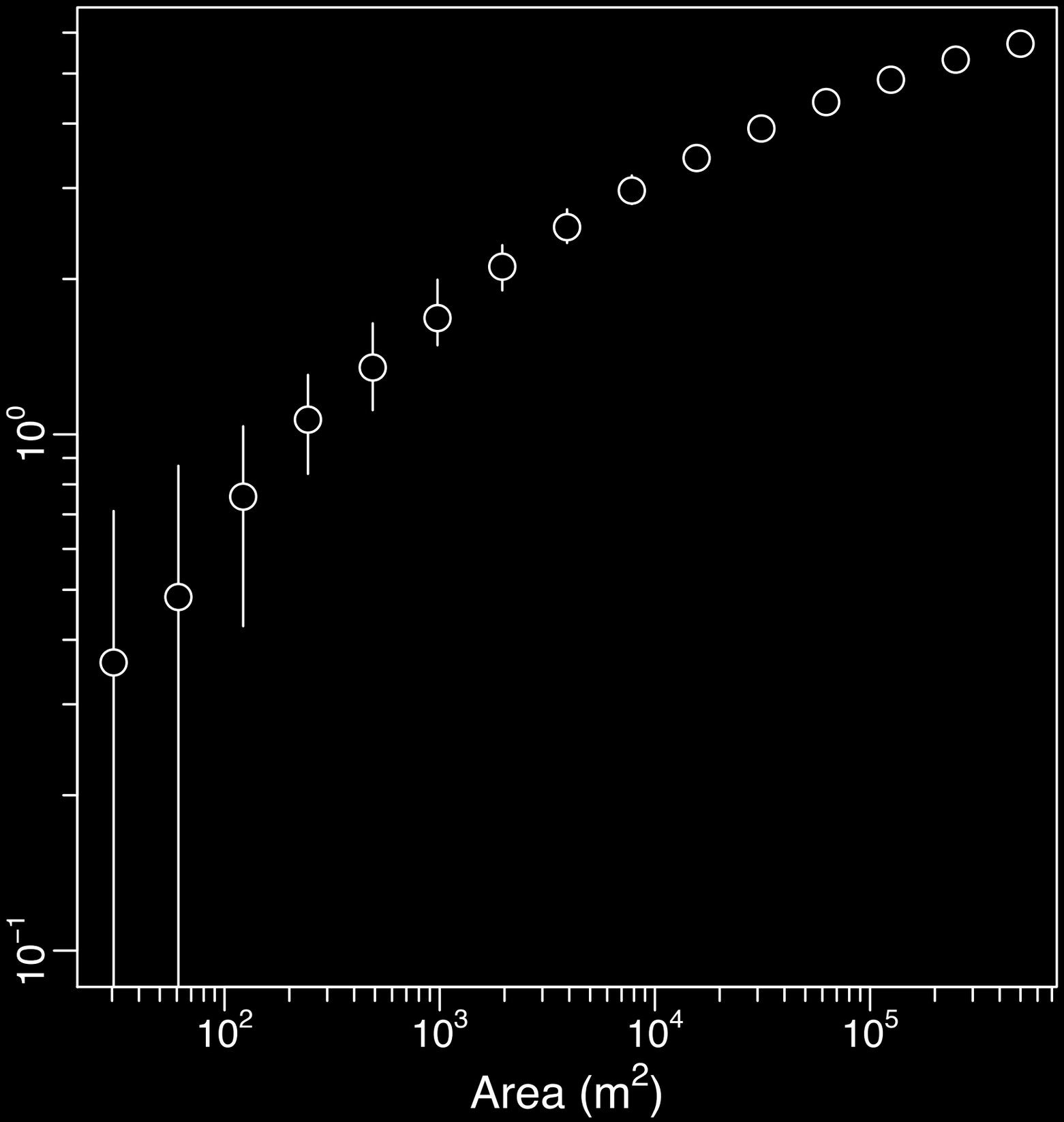
data from: urbanforestmap.org

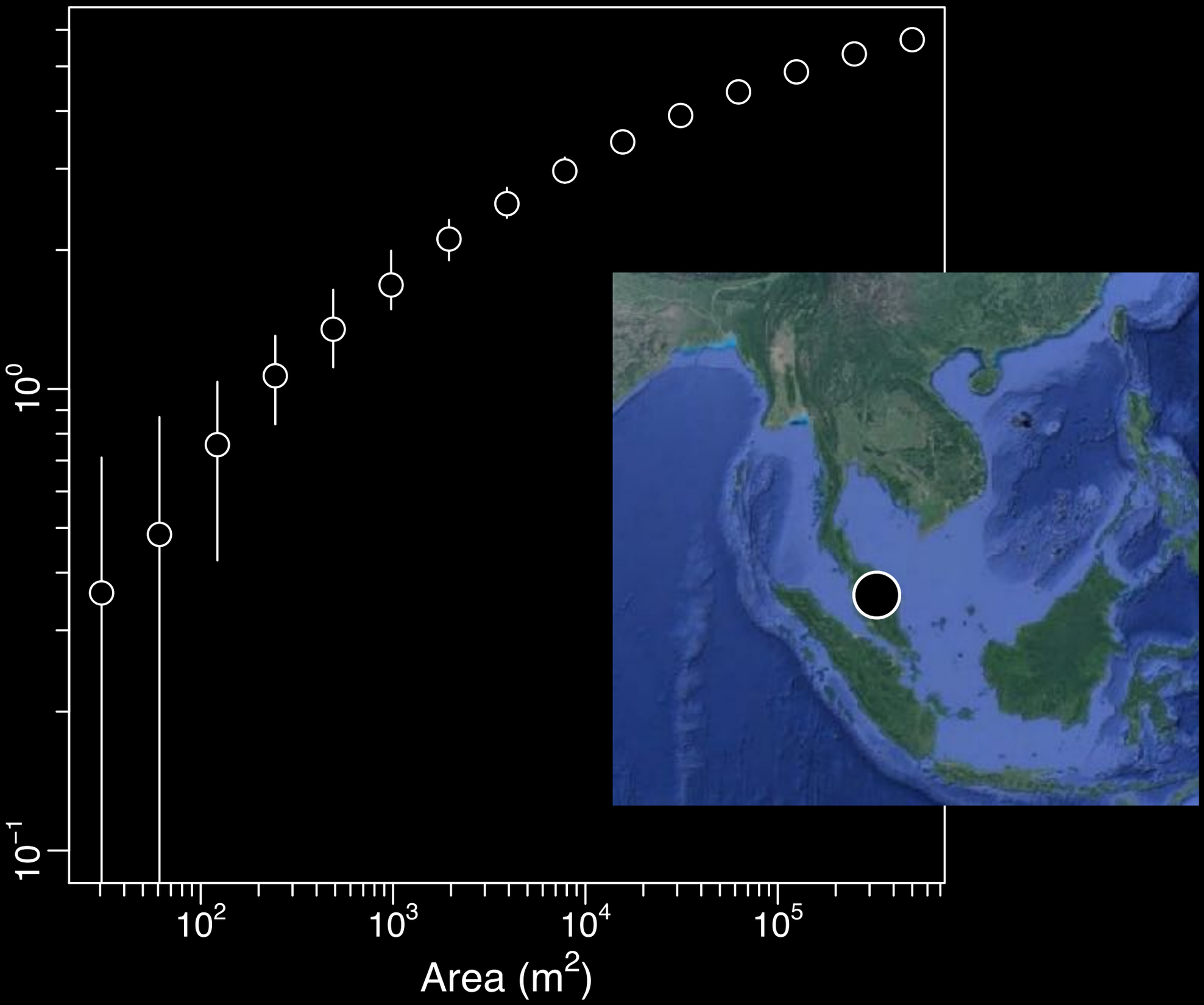
Gruner (2007) *Biol. J. Linn. Soc.*

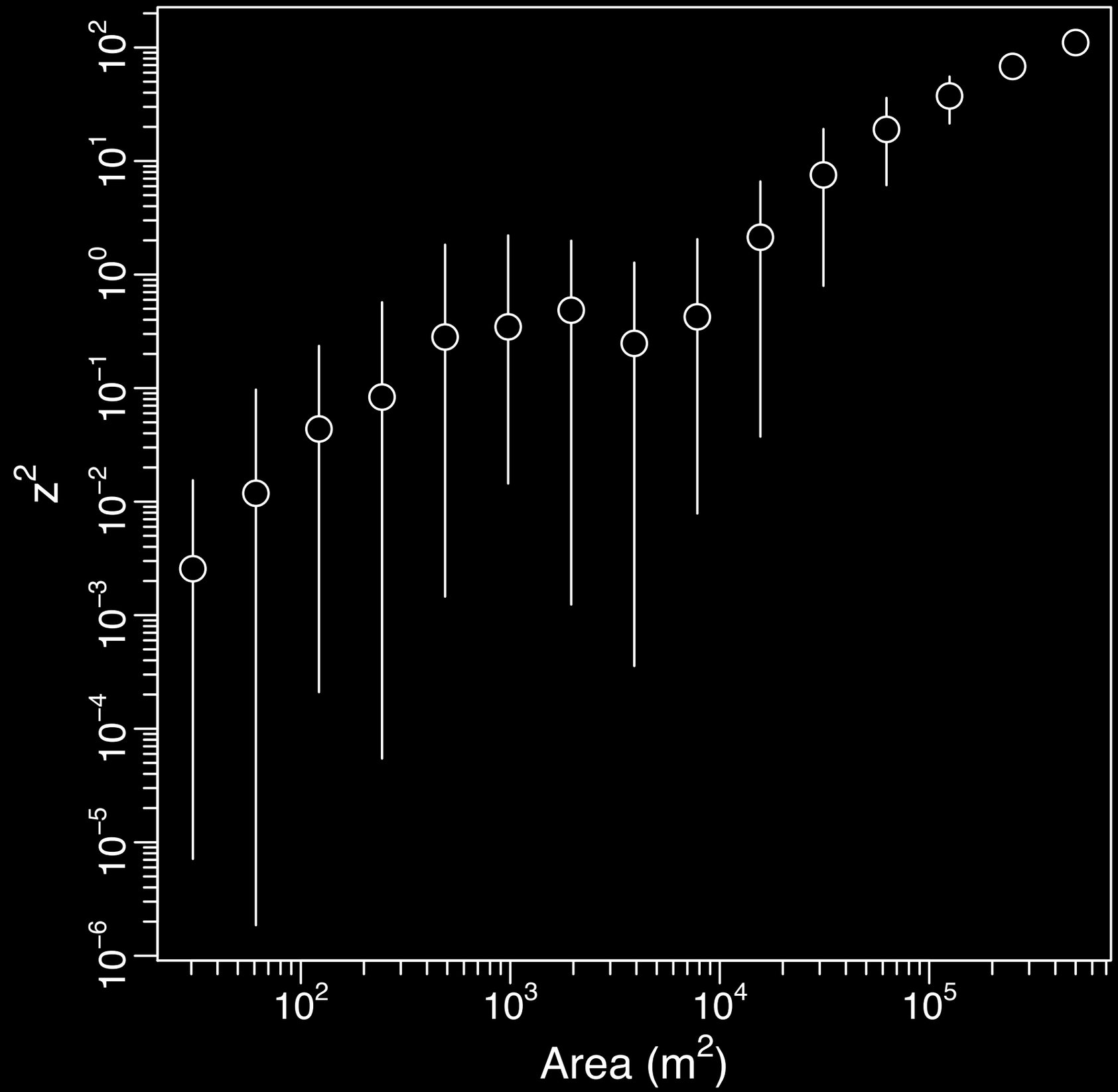
US Breeding Bird Survey

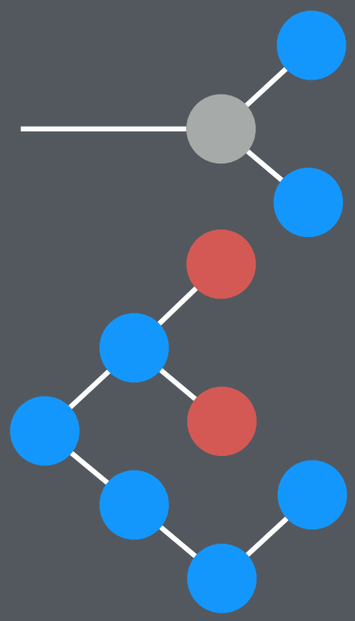
What about biology?

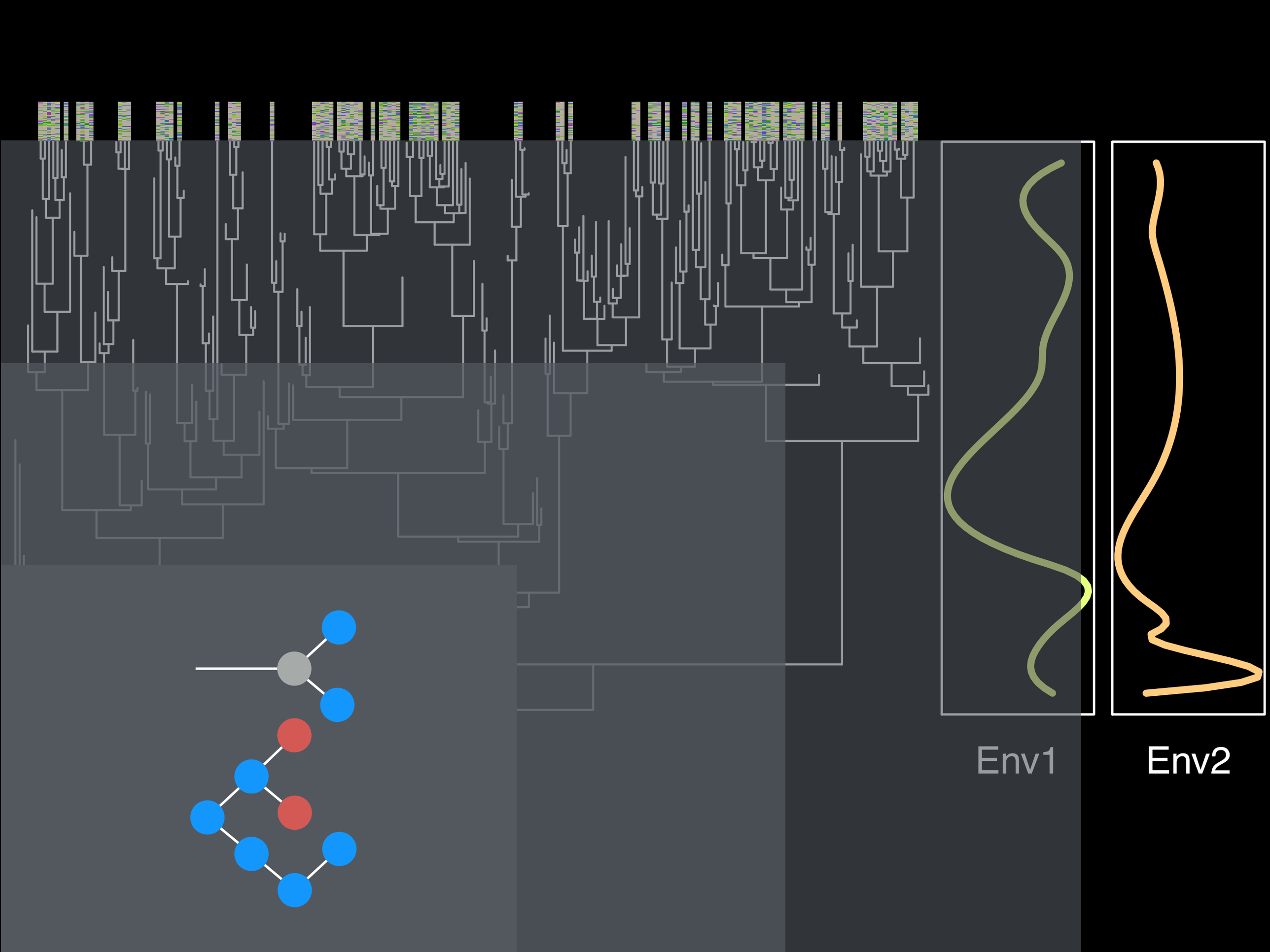

Env1
Env2


S
10^0
10^{-1}
10^2
10^3
10^4
10^5
Area (m^2)

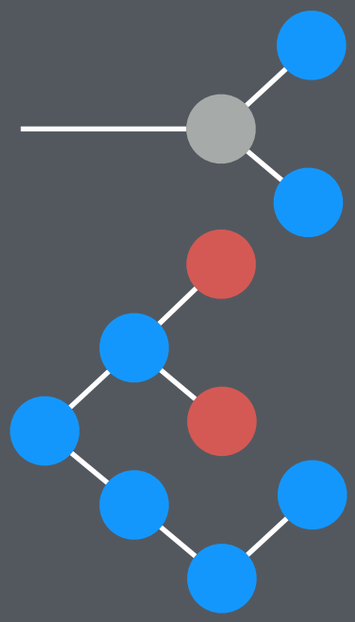

S
10^0
10^{-1}
10^2
10^3
10^4
10^5
Area (m^2)

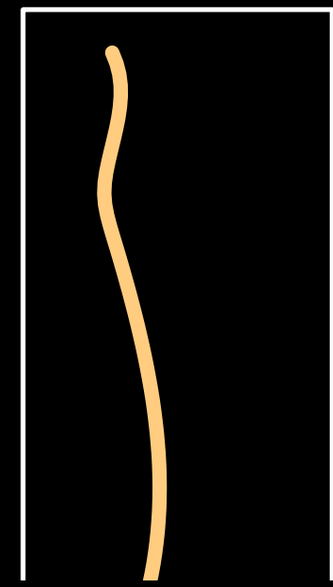

z^2
10^{-6}
10^{-5}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
10^{2}
10^{3}
10^{4}
10^{5}
Area (m^2)




Env1
Env2

THANKS!!





Env1

Env2