Hypervolume geometry

α-diversity:

$$\text{Volume} = \sum_{c=1}^{c} v_c$$

$$v_c = \prod_{i=1}^{i} \frac{\max(x_i) - \min(x_i)}{d}$$

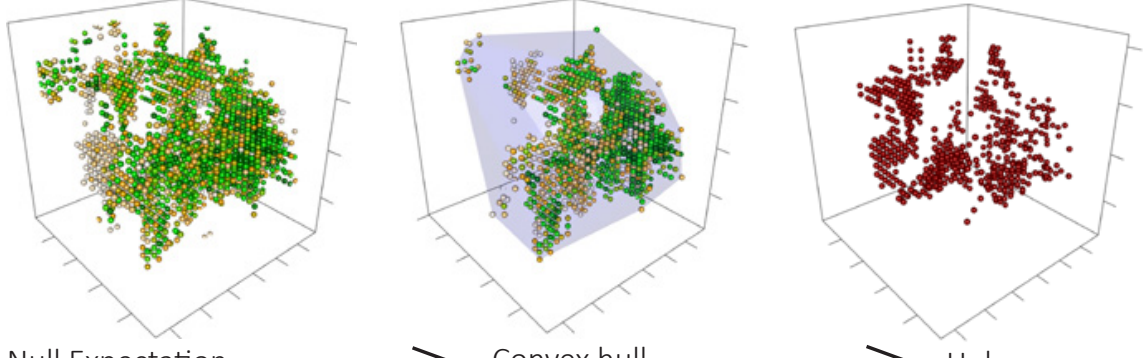
$$\text{Dispersion} = \frac{\sum |x_c - WC|}{c}$$

Position:

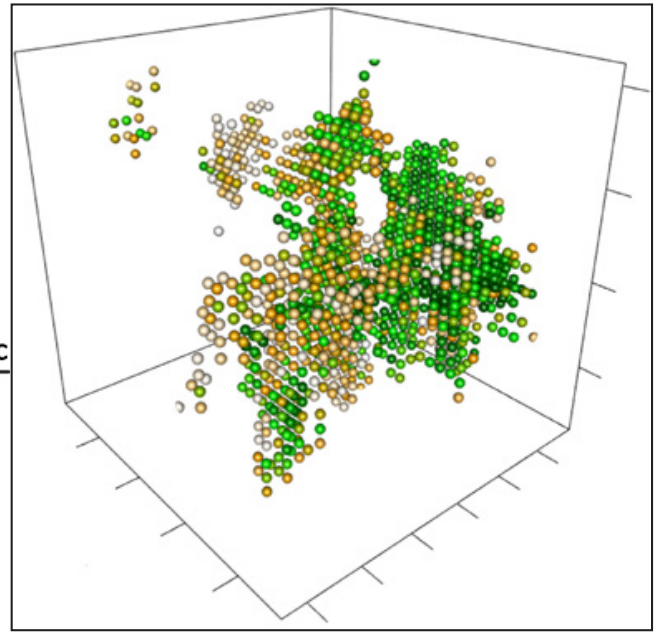
$$\text{Weighted centroid} = [WC_i] = \frac{\sum x_{ic} w_c}{\sum w_c}$$

$$\text{Central density} = \{c : p_c \leq t\}$$

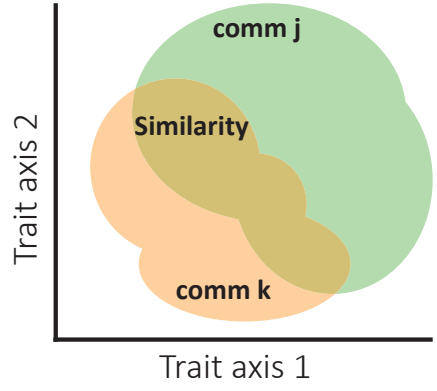
Holes:



Observed community



β-diversity:



$$\text{Similarity} = \sum_{s=1}^{s} \min(w_{js}, w_{ks})$$

Comparisons:

Communities across land use gradient

Funcitonal guilds within communities

Communities to null expectaion

1000 draws from species pool

Maintaining:
- Species Richness
- Abundance

Biological constraints:
- Dispersal
- Environmental affinity