Steps: Clustering of vertical niches

1. Daily median depths for each species / individual were computed, and the data were subsetted to species with 5 or more observed individuals.
2. Depth data were binned into 10 meter intervals, summarizing the number of median daily depths in each interval from 0-10 meters to 1500-1510 meters (the maximum depth observed for all species). For each species, the proportion of daily median depths in each depth bin i ("proportion time at depth", p_i) was computed.
3. For each pair of species, Bhattacharyya's coefficient was computed using the proportion time at depth. For two species x and y and 151 10-meter depth bins:

   $$B_{x,y} = \sum_{i=1}^{151} \sqrt{\mathrm{p}_i(x) \times \mathrm{p}_i(y)}$$

   Bhattacharyya's coefficient ranges from 0 to 1 and measures the similarity between two discrete probability distributions, where 0 indicates no overlap between distributions, and 1 indicates identical depth distributions.

   Bhattacharyya's coefficient was converted to a dissimilarity by subtracting the value of the coefficient from 1:

   $$\tilde{B}_{x,y} = 1 - B_{x,y} = 1 - \sum_{i=1}^{151} \sqrt{\mathrm{p}_i(x) \times \mathrm{p}_i(y)}$$

4. Hierarchical clustering analysis was performed using Ward's minimum variance method.
5. Following cluster analysis, species were assigned to 6 discrete clusters. The number of clusters was chosen by plotting the within-cluster some of squares against the number of clusters.