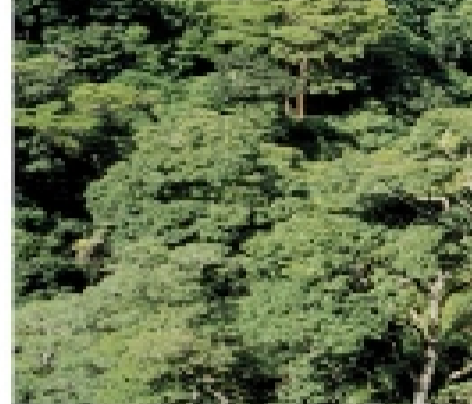


## Diversity - latitudinal trends

### Temperate forests



### Tropical forests



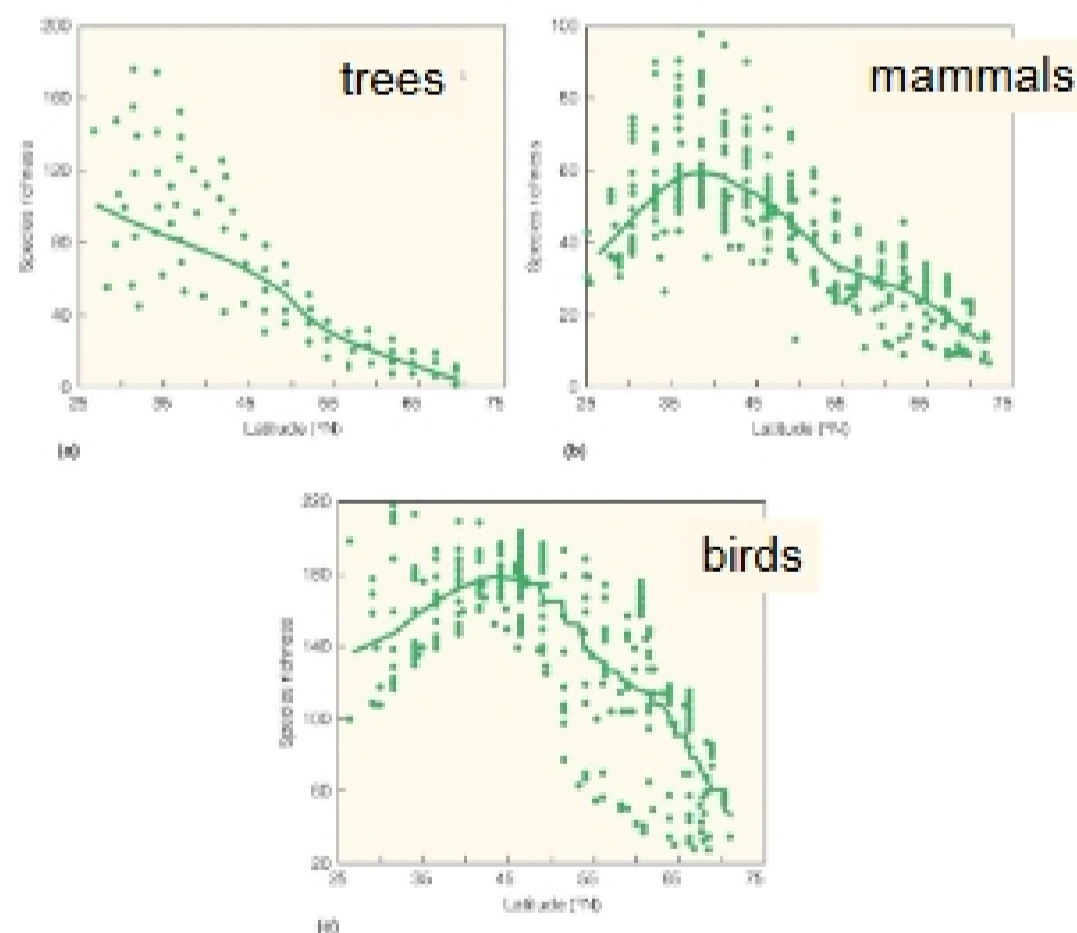
# species:

Trees (per 10 ha)	15	450-700
Birds	20-30	>300
Insects	many	millions
Fish	many	4 times
Ants	entire Utah	= 1 tree

For most groups of organisms, the tropics is 10-100 times more diverse

## Diversity

### 1. Higher latitudes have lower diversity (data from N. America)

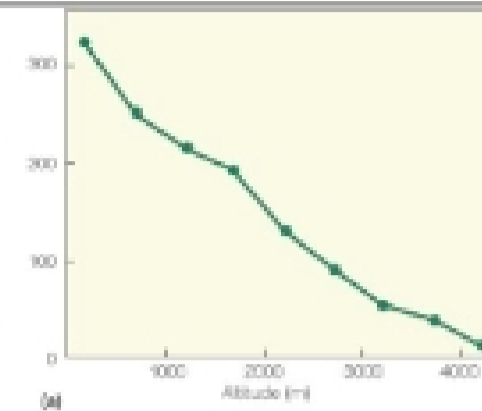


## Diversity

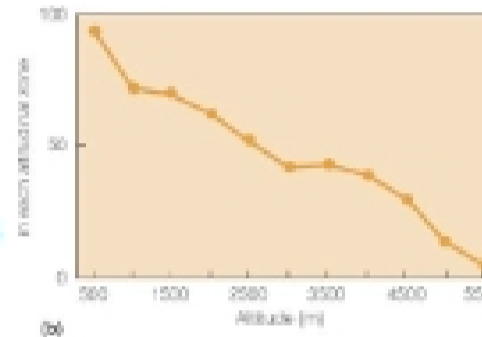
2. Higher altitudes have lower diversity



Birds

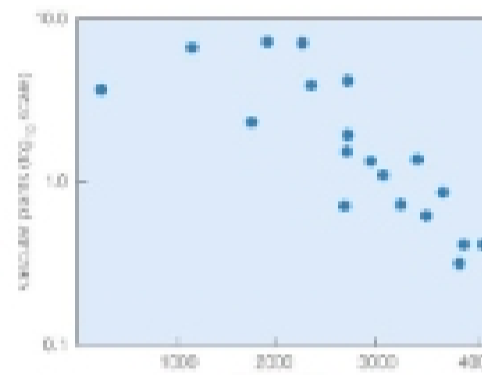


Mammals



3. Islands have lower diversity

Plants

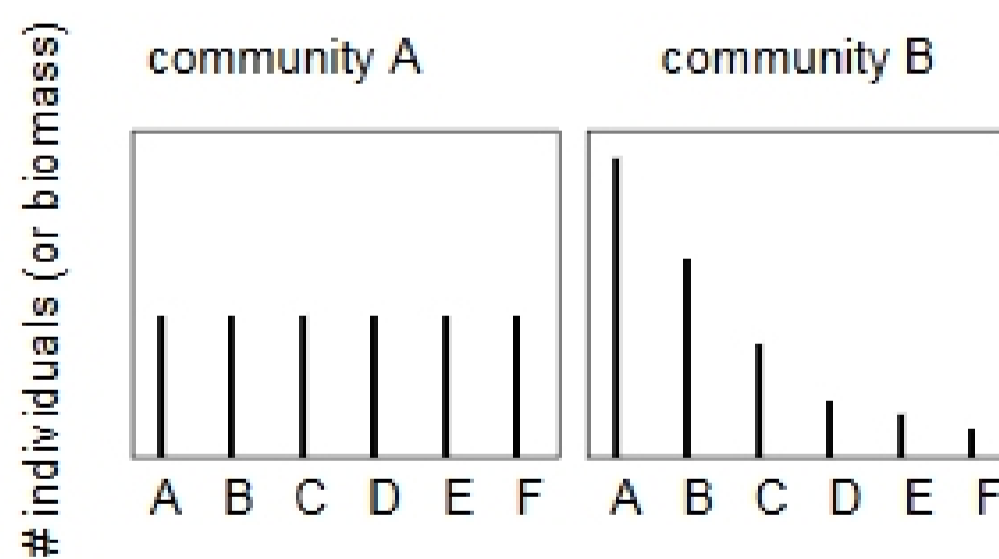


Low - altitude - Hi

## How do we measure diversity?

- Species richness: total number of species
- Species evenness: how evenly are the individuals distributed among species? [takes into account abundance]

Two hypothetical communities with the same species richness but different species evenness



## Scales of diversity?

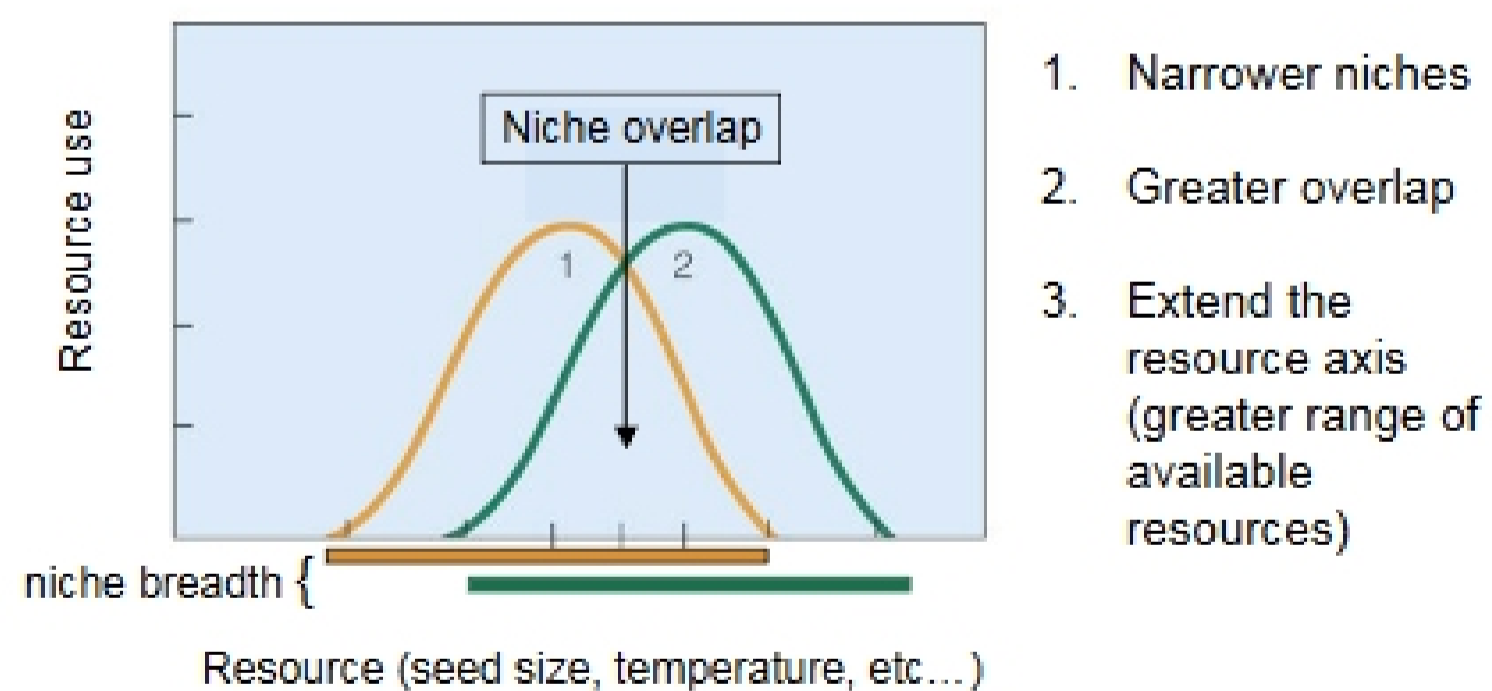
- a. Beta ( $\beta$ ) diversity: diversity across habitats  
(mountains, valleys, swamps ....)  
diversity can be high because there are lots of different habitats

- b. Alpha ( $\alpha$ ) diversity: diversity within a single habitat

diversity can be high if more species can coexist in the same habitat



## Higher alpha diversity reflects niche partitioning



So can we explain the latitudinal gradient in diversity using factors that would affect niche partitioning?