Competition & Species Diversity

**Today's topics:**
- Finish Competition and Niche Partitioning
- Predation
- Species diversity
- Island Biogeography
- Food webs

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**Global Patterns of Diversity**

Tropical habitats support much larger numbers of species than do temperate and polar regions.

- **Which of these communities is more diverse?**
  - Community 1: A: 25% B: 25% C: 25% D: 25%
  - Community 2: A: 80% B: 5% C: 5% D: 10%

Imagine a newly formed island some distance from the mainland...

What will determine the rate of arrival of new species?
Species richness will be a balance between immigration and extinction.

How would these curves change for a larger island? How will that affect the equilibrium number of species?

Example: Plants on the Galapagos Islands

Endemic Galapagos prickly pear cactus tree

The role of Disturbance

Secondary Succession after fire

(a) Soon after fire
(b) One year after fire

Plant Succession
Fig. 54-22-4
Primary Succession at Glacier Bay

![Image of glacier bay with stages labeled: Pioneer stage, Spruce stage, Dryas stage, Alder stage.]

Alaska Glacier Bay

Fig. 54-23
Number of taxa vs. Log intensity of disturbance

![Graph showing the relationship between number of taxa and log intensity of disturbance.]

Fig. 54-11
A terrestrial food chain

![Diagram of terrestrial food chain with carnivores, herbivores, and primary producers.]  

Fig. 54-12
A marine food chain

![Diagram of marine food chain with phytoplankton, zooplankton, fish larvae, and juvenile striped bass.]  

Fig. 54-13
Is this starfish a Keystone Predator?

![Graph showing the number of species present with and without Pisaster.]

EXPERIMENT

RESULTS

High (control): natural rate of litter fall  
Medium: \( \frac{1}{10} \) natural rate  
Low: \( \frac{1}{100} \) natural rate

Productivity

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