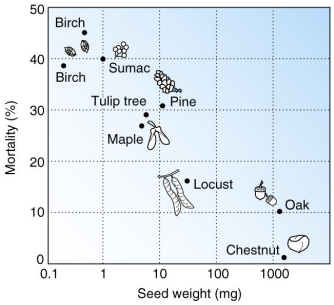
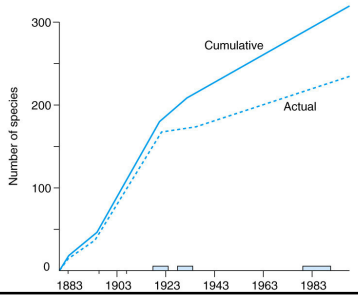
Dominance vs. Founder Controlled Community

- **Founder controlled community** - Early community determined by dispersal ability
  - R-selected
  - K-selected



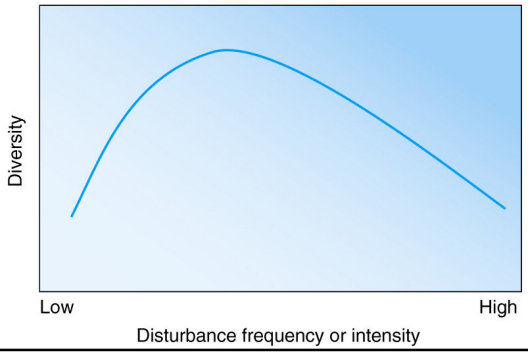
Dominance vs. Founder Controlled Community

- **Dominance Controlled Community** – Over time, poorer dispersing species (better competitors) arrive and dominate.
  - R-selected
  - K-selected



Intermediate Disturbance Hypothesis

- Where do we observe the greatest diversity in terms of disturbance frequency or intensity?



Comparing communities

- Need an index of community similarity
  - Assess resistance or resilience to disturbance
  - Assess "quality" of a system as similarity to a reference community
  - Assess rate of change in community composition
- As with diversity indices, need multiple metrics
  - Qualitative – similarity based on species presence/absence
  - Quantitative – similarity based on relative abundance

Comparing communities

- Index of community similarity
- One qualitative (Jaccards Index), one quantitative (PSI)
- Percent Similarity Index (PSI)
  - Quantitative

$$PSI = \sum_{i=1}^{s} \min P_i$$

  - Where P_i = the proportion of the community composed of species i.
- 0.0 = species proportional abundances not similar among communities
- 1.0 = species proportional abundances identical

PSI Example

	Com. 1	Com 2	$p_{i\ sp.\ 1}$	$p_{i\ sp.\ 2}$	Min p_i
Species 1	9	5	0.183673	0.084746	0.084746
Species 2	7	5	0.142857	0.084746	0.084746
Species 3	3	4	0.061224	0.067797	0.061224
Species 4		5	0	0.084746	0
Species 5	5	28	0.102041	0.474576	0.102041
Species 6	25	9	0.510204	0.152542	0.152542
Species 7		3	0	0.050847	0
N	49	59		PSI	0.485299

Diversity Indices		
S	5	7
H'	1.34	1.60

Jaccards Index (Qualitative)

- Species abundance ignored, only presence or absence of species used.

$$Jaccards = \frac{a}{a+b+c}$$

- Where
  - a = number of species in both communities
  - b= number of species unique to community 1
  - c = number of species unique to community 2
- 0 = no species in common
- 1.0 = all species in common

Jaccards Index Example

	Com. 1	Com 2	Jaccards		
Species 1	9	5	a		
Species 2	7	5	a		
Species 3	3	4	a		
Species 4	0	5	c		
Species 5	5	28	a	Total	7
Species 6	25	9	a	A	5
Species 7	0	3	c	B	0
				C	2

$$Jaccards = \frac{a}{a+b+c}$$

Jaccards	0.714286