Scenario

In addition to his studies of *Phlox cuspidata* in Texas, Levin also monitored 73 subpopulations of the species *P. drummondii*. In contrast to the highly selfing *P. cuspidata*, *P. drummondii* is self-incompatible and thus exclusively outcrossing. Levin scored allele frequencies for *P. drummondii* subpopulations at the 6-*pgd* allozyme locus. He also observed heterozygote frequencies in the populations.

Phlox drummondii

Learning Objectives

1. Calculate population heterozygosities and F-statistics using real data
2. Interpret the F-statistics to make conclusions about the biology of the species

Instructions

Working in groups of **2-3** students, use the data provided to complete the calculations & questions below. We will go over the answers as a class.

1. Calculate $\overline{H}_I$ using the data provided to you (see below)
2. Calculate H_S for each subpopulation using the data provided.
    a. Which population is furthest from the expected heterozygosity?
    b. Is the average observed heterozygosity less than, greater than, or equal to that expected under random mating?
3. Calculate the 3 F-statistics for this metapopulation.
    a. Given the mating system of *P. drummondii*, take a minute to hypothesize how these F-statistics may differ from those *P. cuspidata*.
    b. Now, compare these F-statistics to those that we calculated in class for *P. cuspidata*. Do the F-statistics for *P. drummondii* fit your expectations for this species, given its mating system? Why or why not? If not, do you have a possible explanation for this lack of fit?

Subpopulation	**p**	**q**	**H_I**	**H_S**	**H_S-H_I**
1-66	1		0		
67	0.86		0.06		
68	0.8		0.12		
69	0.7		0.2		
70	0.96		0.03		
71	0.96		0.09		
72	0.73		0.15		
73	0.91		0.06		
Averages:					

H_T	
F_{IS}	
F_{ST}	
F_{IT}	