

## Data Interpretation Exercise

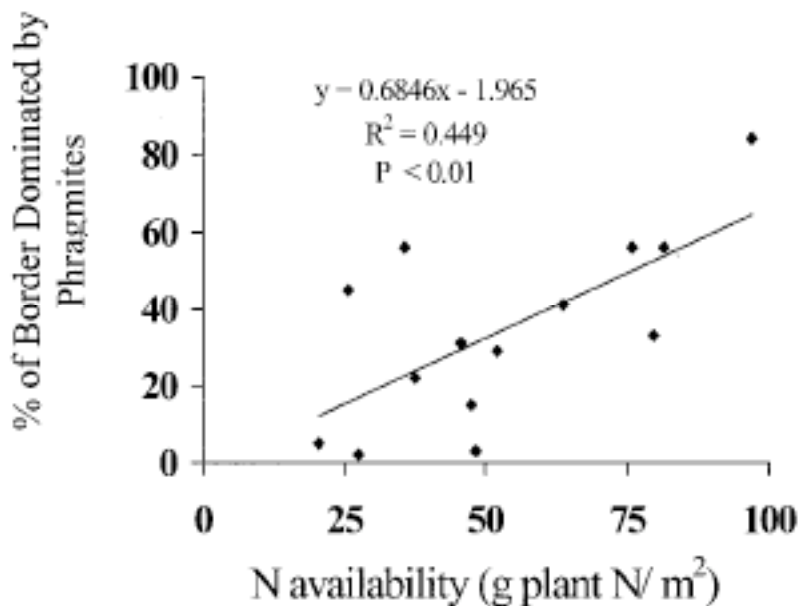
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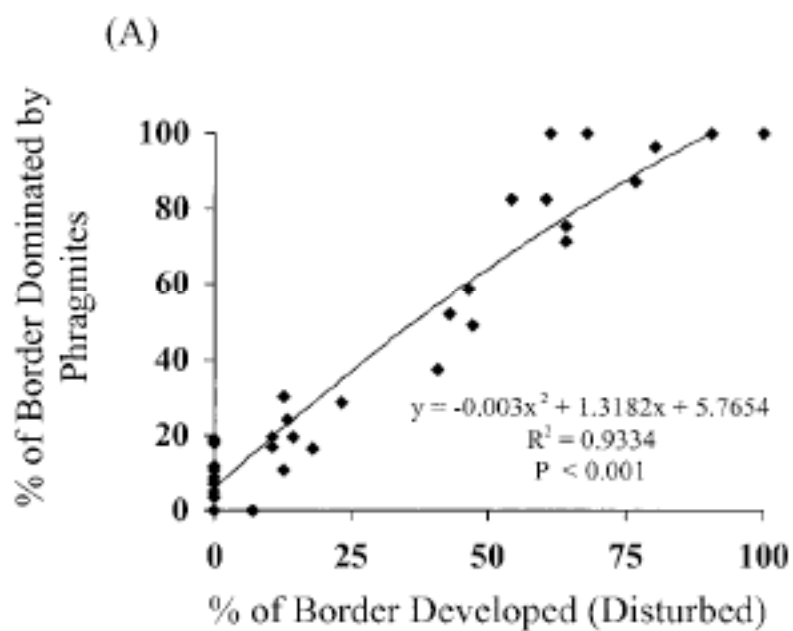
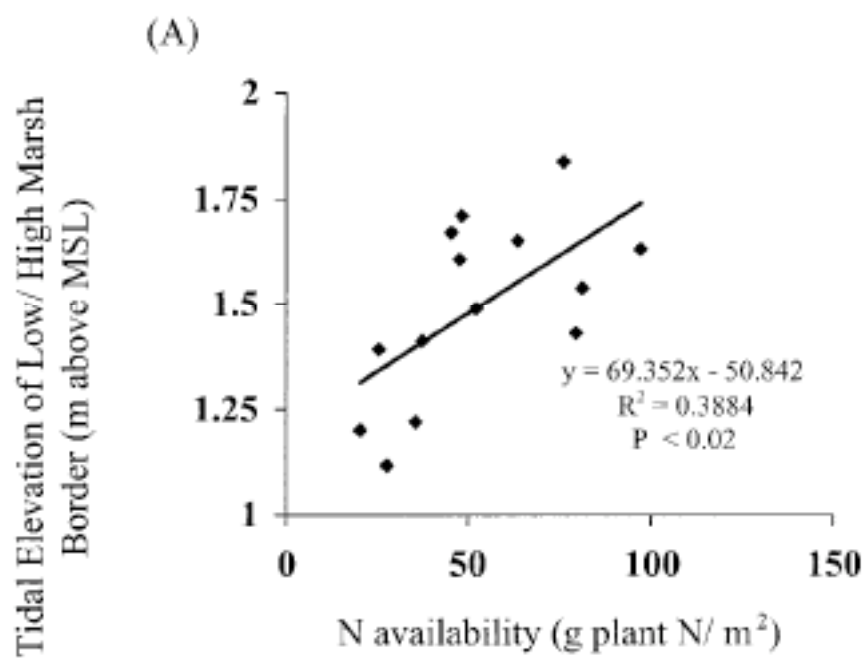
### THERE ARE THREE SETS OF QUESTIONS

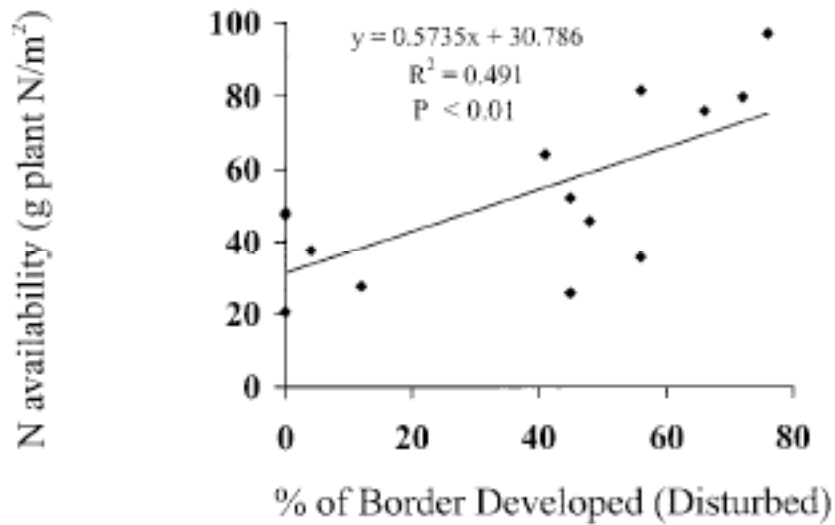
Please Type your answers and turn in a hard copy on Monday February 8 in class. Any items received after this will receive a late penalty.

#### Set I

A group of researchers were interested in the effects of human impacts on salt marshes. They were able to use maps to measure the percent of area bordering a marsh that was developed into housing. They were also able to use a very accurate level to measure the elevation at which one went from vegetational species of the lower part of the marsh to the vegetational species of the high marsh. They also were interested in the presence of an invasive species, the plant *Phragmites australis*, which tends to invade areas that are disturbed. Finally they were interested in measuring nitrogen taken up by the low marsh plants (=nitrogen availability). Keep in mind that nitrogen is a crucial nutrients for plants, but it turns out to benefit the low marsh plants the most. The low marsh plants tend to grow better than the high marsh plants when nitrogen is available. Below are a series of figures showing their results, which tells a story.





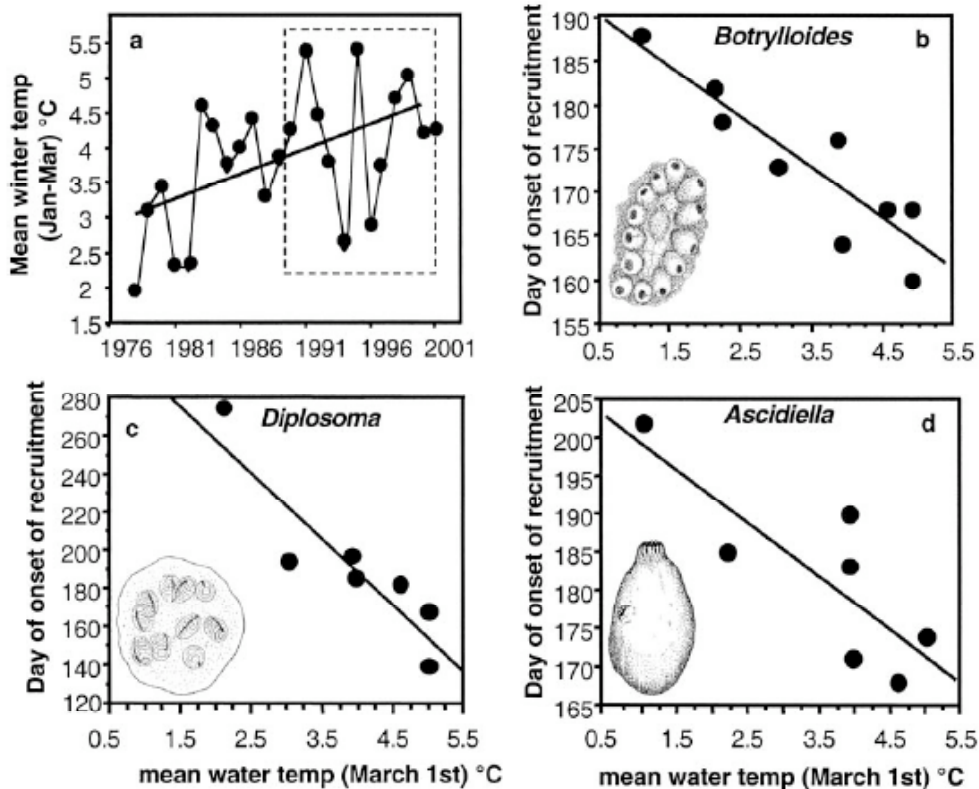


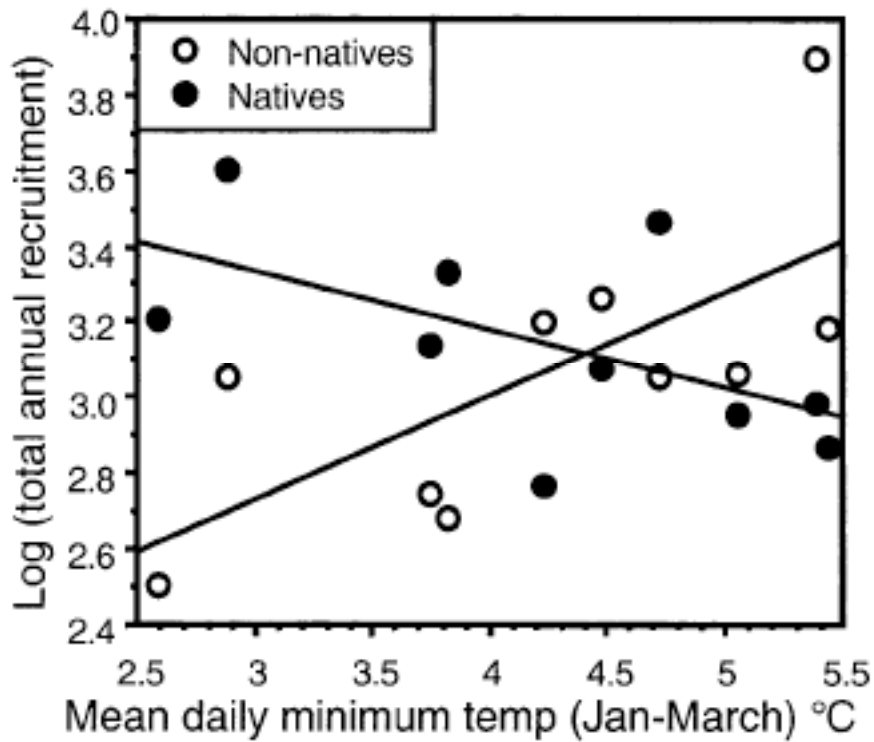
Examine these figures and answer the following:

- What is a salt marsh?
- What plant group does *Phragmites australis* belong to?
- From what you can see of these results, what does increased development of the border of the salt marsh do to nitrogen (N) availability to the low marsh plants?
- Write a paragraph describing the results these workers found. Try to order your thoughts about what these diagrams might say about cause and effect.

## Set 2

Many have been concerned what might happen as ocean temperature increases, especially because many species are being introduced from other regions and can invade a fauna and take over, displacing the local species. This study looked at recent temperature changes in Long Island Sound and also the larval recruitment (which is the time when planktonic larvae of a bottom-dwelling species settle and begin to grow into adults on the bottom) time of three invasive invertebrate species (remember that an earlier day number means earlier in the spring). They also looked at the total amount of larval recruitment of native and invasive species as a function of overall temperature for a given year.





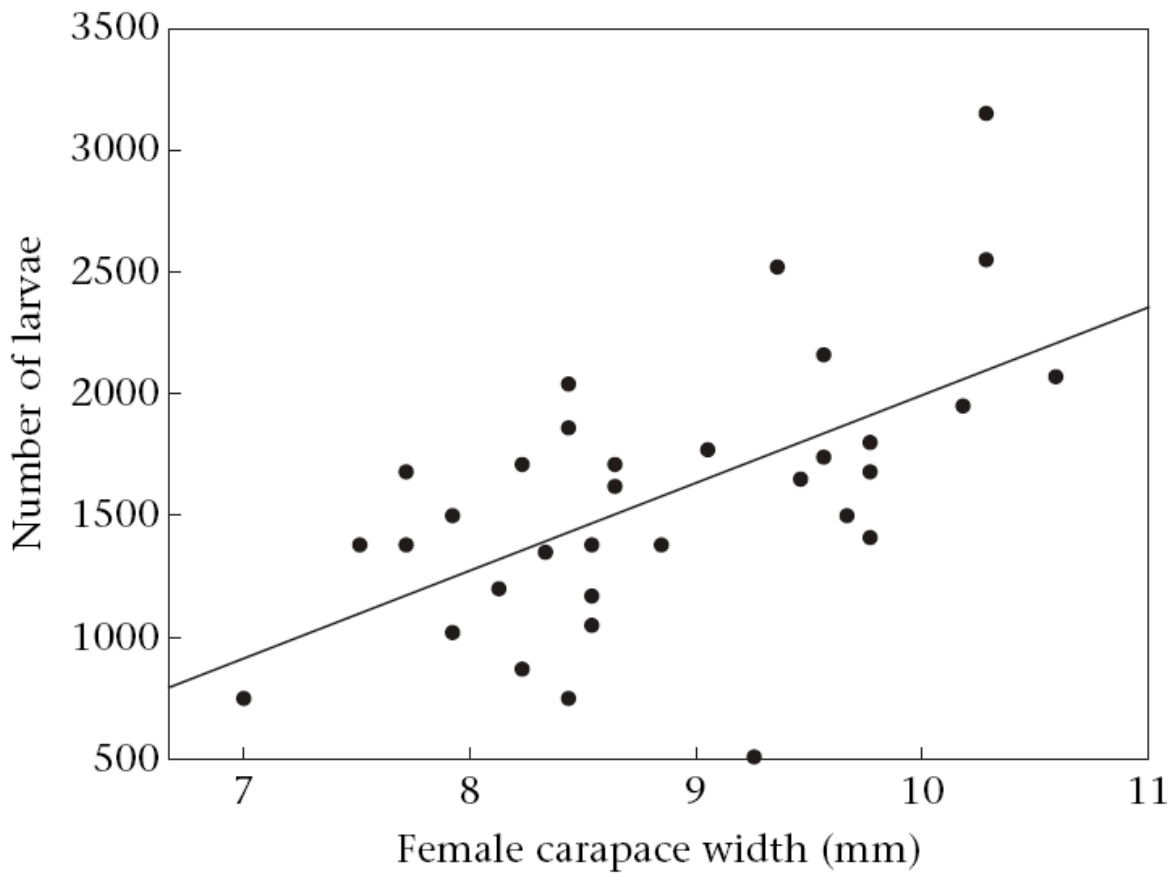
Answer the following questions:

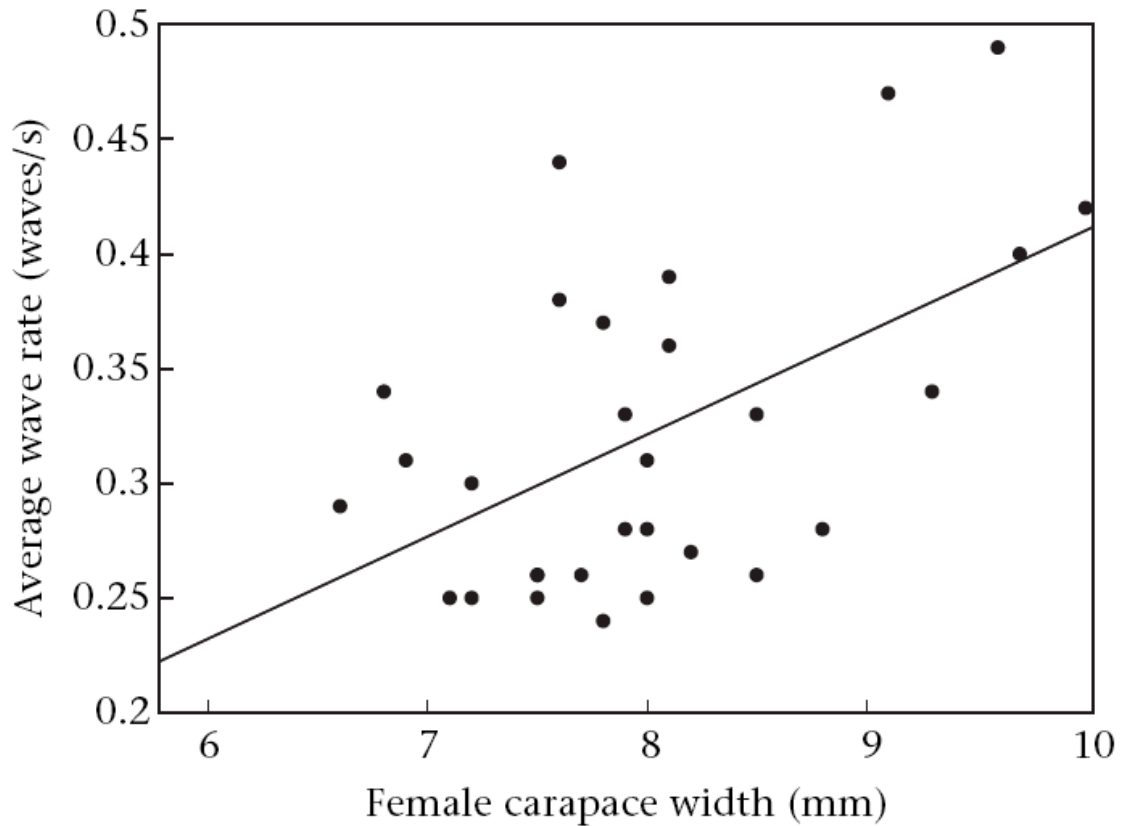
1. Taxonomically speaking, what is an ascidian or sea squirt?
2. How has temperature changed in Long Island Sound in the past 25 years?
3. What does this temperature change mean when we consider the recruitment times of the three invasive species of sea squirts?
4. What do you think will happen in the future with regard to dominance by invasive species versus native species?

### Set 3

In many studies, one can observe that mating is not random. Females often choose males that are the most colorful or largest of all of the choices. This is a study where someone looked at how males might operate.

Below are results from a study of fiddler crabs. Males wave a large claw to attract females, but they can alter when they wave and the rate at which they wave. Think of the wave rate as an estimate of “enthusiasm” for the female that is before him. The study found two main results, which are shown in the following two figures.





Answer these questions:

1. Where do fiddler crabs live?
2. What is the difference of being a female of differing size?
3. What seems to increase the level of enthusiasm of males?
4. Why would males be enthusiastic in this way? To answer this, think of the short run (the immediate benefit) but also think of the evolutionary long run (that is how might this enthusiasm pattern have an evolutionary benefit for the male?).

END of exercise.