The description of patterns is a fundamental component of ecological studies and science in general. Patterns motivate the questions and hypotheses that ecologists propose and the studies/experiments they design to address them. The goal here is to learn how ecologists describe patterns, and in particular to describe a pattern that will motivate your research proposal for this course. You may choose a pattern from any system you wish (marine, terrestrial etc.). The pattern should be either spatial (e.g., vertical zonation of organisms in the intertidal), or temporal (e.g., changes in the density or abundance of a species over time).

For your **Weekly Log of Pattern Descriptions**, each student must keep his or her own book of descriptions. **Use a grided composition book for this.....no loose leaf pattern descriptions please.** This compilation of pattern descriptions will be periodically turned in for evaluation. The purpose of this weekly log is to teach you how to properly document patterns in preparation for your research proposal.

For your **Research Proposal** students MUST work with a partner (graduate students must work individually). Each pair of undergraduates should turn in only one pattern description with both of your names on it for the pattern proposal assignment.

A pattern description should include the following 3 parts:

1. **Written description of Pattern:** The description should be sufficient to convey the pattern to someone who is not familiar with the system or who might want to go out and try to observe the same pattern themself. In light of this you should (1) begin by stating where and when you observed the pattern. Then (2) describe the pattern clearly and completely, making mention of the features which you found particularly striking. You might want to make some notes about mechanistic factors that might affect the pattern, but try to keep this part of the assignment descriptive. **Do not state hypotheses in this section.** Emphasize the features of the pattern that are pertinent to the goals of your future project and will help you formulate hypotheses about your observations. Describe in detail what you see, hear, feel, tastes, or smell. Conclude with (3) a separate sentence or two in which you state very succinctly the specific pattern you are focusing on. Identify the specific parameters of interest (light intensity, temperature, plant size, height above water surface, etc) and the observed relationship(s). Reread your description and ask yourself “based on this information could a stranger go out and duplicate my observation(s)?”

2. **Illustration of the pattern:** Draw the pattern you have observed. Include as much relevant information as possible (e.g. labels, scale bars, distances between objects, colors etc.) to help orient the reader. Although it can be difficult with some patterns the goal of this part of the exercise is to be able to describe the pattern based solely on the illustration. Look at the drawing you have created and make sure a person could describe the focal pattern without reading your verbal description.

3. **Graphic Description:** The graph should clearly and quantitatively describe the pattern. There are three fundamental components to every graph. A **figure legend** describes the pattern (or result) that the graph is trying to illustrate. It also explains the units and
axes, so the reader can easily interpret what is graphed. **Axes labels** identify what the points in a graph represent relative to that axis (e.g., the mean [and measure of variance] density [# per m²] of species X). Remember that the dependent variable is plotted on the vertical axis and the independent variable is plotted on the horizontal axis!! When choosing your axis parameters makes sure to ask yourself “How would I measure this?” Each axis needs clearly quantified **units** so the reader understands what each point on the graph represents and how they scale relative to one another (e.g., log scale). You should be able to understand the pattern from the figure and figure legend. If a reader can't, then the figure is flawed (either lack of detail or poor legend or labeling).

At some point we will ask you to proposed one or more hypotheses about the patterns you have observed. Do this in the following way

1. **Written Description of Pattern**

2. **Statement:** Begin with a brief, succinct 1-2 sentence statement of the hypothesis. This should be as direct and to the point as possible.

3. **2 general Hypotheses**

4. **1 specific hypothesis for each general hypothesis**

5. **Illustration**

6. **Graph**