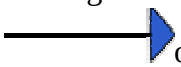
Developing Qualitative Models: Creating Models by Hand

Steps for creating your qualitative ecosystem model:

Work alone on this part:

http://tiw.research.pdx.edu/original/links_tbd.htm1. Think carefully about choosing the central two variables in your study. You might start with who eats whom. Then, think about 3 to 5 other main species, and abiotic factors, (both independent and dependent variables) that are relevant to your research study. You might ask: how does the weather affect the species involved? List these. Note down your reasoning for choosing these to use in your essay later.

2. Begin constructing the model starting with two main variables (organisms). Write the name of each component in its own circle or box. What is the relationship between these?

3. Qualitative models are typically drawn as familiar and intuitive 'signed digraphs' consisting of ecological 'components' (in boxes) and positive  or negative  'links' (arrows). A component is any variable part of an ecosystem. For example, an ecosystem component could be a population of a given species, or the amount of nitrogen held in the soil, or the temperature of the water in a stream. Links are symbols that represent interactions occurring between components. These can be used to show a flow of materials or energy between components, or to indicate a causal effect of one component on another. The term 'system' refers to any combination of two or more components that have some form of interaction between them. Interactions between populations of different species in a community can be classified with combinations of the three symbols {–,0,+}. This modeling also uses a simple line for no effect or unchanged.

Review the different types of symbols and interactions. Draw in the representative interaction.

4. Add the other 3-5 additional important components to the model one by one. As each component is added, think about how the component would interact with the components already entered into the model. An alternative method is to write each component on a separate index card, and connect them with pieces of string. This will allow you to move them freely until you are satisfied with the pattern. Then transfer the pattern to paper. Chose the symbol you think best describes the interaction. As interactions are added, decide which interactions seem to be significant and which seem more frivolous (e.g., while the body temperature of a deer may raise the temperature of the grass it naps on, this is probably going 'overboard' with information).