Biology 4605/7220/ST4581 Name_____
Quiz 8a. 27 November 1996

A marine biologist measures the following variables once a month at 50 sites where humpback whales *Megaptera novaeangliae* become entangled in gill nets. Assign a symbol to each variable.

_____ Number entrapped

_____ Number of caplin in net

_____ Number of cod in net

_____ Depth of net (m)

_____ Mesh size of net (cm stretch mesh)

_____ Water clarity (0 = clear, 1 = murky)

_____ Sky cover (%)

_____ Age of whale (young, old).

1. Draw a box and arrow diagram for expressing a preliminary model of the relation of these 8 variables. Use one box for each variable.
Arrows should go from explanatory to response variable.

2. Compute the number of potential arrows in your diagram. The formula for number of pairs of n boxes is:

arrows = 2 * pairs

$$\text{Pairs} = \frac{n!}{(n-2)!}\ \frac{1}{2} \qquad \text{where } 3! = 3 \cdot 2 \cdot 1$$

arrows = _____

3. What is the degree of reduction in your preliminary model, relative to the potential number of arrows ? Express this as a ratio, the number of arrows in the diagram, relative to the potential number.

reduction = _____

4. How might you further simplify your preliminary model ?