MODELING WATERSHED MANAGEMENT SCENARIO II

—Agriculture Land Use Increases

Name_____ **Date**_____

1. As agriculture increases in Tuscaville, increasing amounts of phosphorus from fertilizer are draining into Lake Tuscaloosa. As Watershed Manager in this scenario, you will use the STELLA model to make predictions and help you with management decisions. Before you begin, what do you predict will happen to Lake Tuscaloosa as agricultural land use increases? Will it become more or less eutrophic? Why? Explain.

2. What will happen to forested land as agricultural land increases?

3. Run four simulations with Percent of Watershed in Agricultural Use equal to 20%, 40%, 60%, and 80%, and keep all other variables constant. To change the Percent of Watershed in Agricultural Use value, either slide the "Percent of Watershed" control bar to the appropriate number or click on the slide bar's number window, type in a new value, and press "Enter".
4. In the chart below, record the day Secchi Depth falls below 10 m. Was your prediction correct? Did the lake become more or less eutrophic? Explain.

Agricultural Land Use %	Day Secchi Depth Falls Below 10 M
20%	
40%	
60%	
80%	

5. What generally happens to **Dissolved Oxygen on the Bottom** as **Algal Density** increases?

6. What causes this general pattern in **Dissolved Oxygen on the Bottom** of the lake?

7. Set the **Percent of Watershed** in agricultural land use to 65%, and use the model to observe what happens to **Secchi Depth** as Agricultural Practice changes. Run the model four times using Agricultural Practice values of 2, 4, 6, and 9. Record the results in the chart below.

Agricultural Practice	Day Secchi Depth Reaches 10 M
2	
4	
6	
9	

8. As Watershed Manager, what general recommendations would you make to the town of Tuscaloosa about Agricultural Practices and Land Use? Explain.