Model Projections

USDA Forest Service *Climate Change Tree and Bird Atlases* modeling and the Michigan Natural Features Inventory:

Online answers and questions

2. Are the models able to predict suitable habitat for the year 2100? __*Yes*___

3. Are the models able to predict where the species will be in 2100? ___*No*___

5. What range of mean annual temperature conditions will your local community likely experience by 2100 according to the average of the three climate models high emissions scenario (Avg. of3- high)? *Answers will vary depending on the community.* What about under the average of three climate models low emissions scenario (Avg. of 3- low)? *Answers will vary depending on the community.*

6. How do the models compare with the current mean annual temperatures for your hometown? *Answers will vary, but for nearly all counties in Michigan, using this model, the mean annual temperature is projected to increase.*

7. What other predictors may influence outcomes of tree species models? *Soil properties, (including: pH, soil productivity, soil texture and type, depth to bedrock), elevation, land use (urban, agricultural, forest, etc.)*

8. Predictor: *ex. depth to bedrock*. Definition: *the depth of all soil horizons to the bedrock*

10. ***Answers will vary within the table, depending on county.***

11. Is the distribution and abundance of the tree species you selected projected to change in the future? If yes, how so? *Answers will vary.*

12. How will changes in tree distribution and abundance affect the animal species within the impacted ecosystems? *If animals depend on certain tree species, then their populations and success will be negatively impacted. Also, if different tree species are moving into an area, the animal species that favor those tree species might find it easier to transition into a new environment.*

14. How do you think that the land use changes have affected the distribution of tree species that you looked at in the climate change tree atlas?

    Answers will vary. Sample answer: Yes, the land use changes have affected tree species distribution. The increase in urban and agriculture land use will result in less suitable habitat for trees. Additionally, much of the urban and agricultural land use increases have occurred around waterways, which could decrease water quality. A decrease in water quality could negatively affect tree populations and distributions.

15. If more of the land in your county was changed to urban or agricultural land to serve the growing population on the planet, how do you think that the tree species you studied would respond? *Sample answer: The increase in urban and agriculture land use will result in less suitable habitat for trees. Additionally, as urban land use increases, tree species that are more pollution tolerant will likely be more successful.*

16. Will tree distribution change only as a result of climate change, explain. *No, many factors will impact tree distribution. Each species of tree has specific requirements in order to thrive, such as precipitation, space, soil pH, and so forth. When one or more of these conditions are not met, the tree will be at risk. Human impacts other than through climate change alone, such as pollution and decrease in available space, also will affect tree distribution.*