

## Modeling & Simulation, Fall 2022

### Project 2: Extending our Butterfly Model

**Due date:** Sat, 9/24, 11:59pm (to Blackboard)

In this project, you will extend the Butterfly Hilltopping Model built in class to consider another question: How does the ability of butterflies in our model to find mates on hilltops depend on the parameter  $q$ ?

To accomplish this, please complete the tasks described in Exercises 4, 5, 6, and 10 on p. 75 of Railsback and Grimm, *Agent-Based and Individual-Based Modeling*, 2<sup>nd</sup> edition. Then write a report that clearly documents the following:

- The results from your visual analysis in Exercise 4, including a couple well-chosen screenshots illustrating your conclusion.
- The results from your work on Exercise 5, including a clear definition of your “clumping” measure and a description of how you programmed this measure in NetLogo
- The results from the artificial landscape in Exercise 6 and the second real landscape from Exercise 10, including a summary of how your results depended on the landscape.

Please also submit your NetLogo code, both electronically and a code listing as an appendix to your report.

For your convenience, several files are posted on Blackboard:

- ButterflyModelv4.nlogo, the last version of the model we developed in class following Chapter 5
- ElevationData.txt, the text input file with elevations for patch coordinates, used in Chapter 5
- ElevationData2.txt, a text input file with the second set of elevation data for Exercise 10. Note that from this file, the x-coordinate ranges from 0 to 201 and the y-coordinate ranges from 0 to 153.

See *Guidelines for Project Reports* for more guidance on expectations for project reports.