The Theory of Island Biogeography

**Definition**

Think of a large office building. It can hold many different people, possibly even several different companies. A smaller office building will hold far fewer people, and may be limited to only one or two different companies. The limit is due to the amount of space - a larger space can hold more people and more companies, while a smaller space can't hold as many.

The same idea applies to **island biogeography**. The theory of island biogeography simply says that a larger island will have a greater number of species than a smaller island. For this theory, an 'island' is any ecosystem that is remarkably different from the surrounding area. So, this could refer to an actual island in the ocean, or it may be an oasis that is surrounded by a desert.

The theory predicts other things, too. For instance, everything else being equal, distant islands will have lower immigration rates than those close to a mainland, and equilibrium will occur with fewer species on distant islands. Close islands will have high immigration rates and support more species. By similar reasoning, large islands, with their lower extinction rates, will have more species than small ones -- again everything else being equal (which it frequently is not, for larger islands often have a greater variety of habitats and more species for that reason).

**Directions:**

**Part 1: Test run**

1. First, you will run the models when both islands are the same size (9) and the same distance from the island (25). Write a prediction before you run the model: do you believe the number of species will be the same on each island? Why or why not?

2) Under **run** hit “go.” Run the simulation until the time reaches at least the 1000 mark. Then hit the “go” button again to stop the simulation. Record the data in the table below

|  |  |  |
| --- | --- | --- |
|  | Island 1 | Island 2 |
| # of species |  |  |
| Species average |  |  |

1. Did your data align with your prediction? Explain.

**Part 2: Island Distance**

4) Under **Island variables,** increase the distance of Island 1 to 60. Write a prediction before you run the model: Which Island do you think will have a greater number of species? Explain your reasoning.

1. Under **run** hit “go.” Run the simulation until the time reaches at least the 1000 mark. Record your data in the table below:

|  |  |  |
| --- | --- | --- |
|  | Island 1 | Island 2 |
| # of species |  |  |
| Species average |  |  |

1. Did your data align with your prediction? Explain.

**Part 3: Island Size**

1. Move the distance of Island 1 back to 25.
2. Increase the size of island 1 to 15. Write a prediction before you run the model: Which island do you believe will have a greater number of species? Why?

9) Under **run** hit “go.” Run the simulation until the time reaches at least the 1000 mark. Record your data in the table below:

|  |  |  |
| --- | --- | --- |
|  | Island 1 | Island 2 |
| # of species |  |  |
| Species average |  |  |

1. Did your data align with your prediction? Explain.

**Analysis Questions:** Answer on a separate sheet of paper in COMPLETE SENTENCES

1) Does your data support the theory of island biogeography? Why or why not?

2) Which variable (time or distance) had the greatest impact on the number of species?