**Explanation of Metacommunity Model - NetLogo**

Patch Turnover Calculations

* The code uses the Previous Species List and Current Species List columns to calculate turnover for each patch individually. This means it measures how species composition changes within each specific patch from one time point to another.
* Specifically, the turnover calculation checks how many species were lost or gained within the same patch over time.
* **Within-Patch Turnover**: The code is assessing the **temporal turnover** of species in each patch, indicating how species come and go within individual patches over the course of the simulation.

**NetLogo Code Description**

**Species and Patch Variables**

• **Turtle Variables**:

• specialization: Trait of the individual species.

• species: Unique identifier for species.

• energy: Energy level for survival and reproduction.

• suitability-range-min/max: Range defining habitat suitability.

• specialist-or-generalist: Indicates functional group.

• random-identifier: Unique identifier for each individual.

• **Patch Variables**:

• suitability: Habitat quality.

• food: Resource availability on the patch.

• identity: Patch identifier.

• unique-species-count: Tracks diversity on patches.

• previous-species-list/current-species-list: Stores temporal species composition.

**Global Variables**

• years: Tracks the simulation time.

• output-file-name: Used for logging simulation outputs.

**Diversity Logging Process**

The update-and-log-patch-species-diversity procedure:

1. **Temporal Tracking**:

• Executes every 50 ticks to analyze community structure.

• Updates the years counter.

2. **Species Diversity Analysis**:

• Gathers species composition and categorizes individuals as generalists or specialists.

• Calculates the number of unique species on each patch.

3. **Sorting and Reporting**:

• Sorts patches based on species count in descending order.

• Logs diversity details for each patch to aid in interpreting community dynamics.