Name
Date
Math 214

**Lab 05**

Wetlands Ecological Succession Model – Fill in the elements of the transition matrix from the Week 2 Checkpoint Exercise

$$x\_{t+1}=\left[\begin{matrix}&&\\&&\\&&\end{matrix}\right]x\_{t}$$

What are the dominant eigenvalue and associated normalized eigenvector for the transition matrix above? – From Week 2 Checkpoint Exercise

|  |  |
| --- | --- |
| **Dominant Eigenvalue** | **Normalized Eigenvector (for Dominant Eigenvalue)** |
| $$λ=$$ | $$x\_{t}=\left[\begin{matrix}\\\\\end{matrix}\right]$$ |

What proportion of the wetlands are in each state every 10 decades? – From Week 2 Checkpoint Exercise

|  |  |  |  |
| --- | --- | --- | --- |
| $$t$$ | $$a$$ | $$s$$ | $$d$$ |
| 0 |  |  |  |
| 10 |  |  |  |
| 20 |  |  |  |
| 30 |  |  |  |
| 40 |  |  |  |
| 50 |  |  |  |
| 60 |  |  |  |
| 70 |  |  |  |
| 80 |  |  |  |
| 90 |  |  |  |
| 100 |  |  |  |

Results from model simulations where the rate at which always submerged wetlands become seasonally submerged is sampled from the uniform distribution$ U[0.01,0.08]$.

Fill in the landscape structure at the end of 100 decades for each of your three simulations.

|  |  |  |  |
| --- | --- | --- | --- |
| Simulation | $$a\_{100}$$ | $$s\_{100}$$ | $$d\_{100}$$ |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |

*Place image A here.*

Results from model simulations where the rate at which always dry wetlands become seasonally submerged is sampled from the normal distribution$ N\left(0.6, 0.05\right)$.

Fill in the landscape structure at the end of 100 decades for each of your three simulations.

|  |  |  |  |
| --- | --- | --- | --- |
| Simulation | $$a\_{100}$$ | $$s\_{100}$$ | $$d\_{100}$$ |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |

*Place image B here.*

*Describe the difference between the simulations with one stochastic parameter versus two stochastic parameters.*