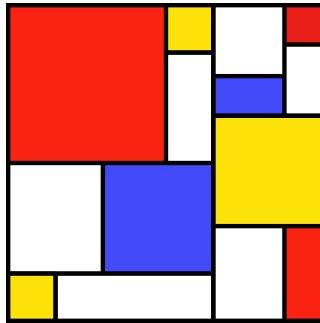


SLiM

Workshop Series



#19: Continuous Space II

Continuous Space and nonWF

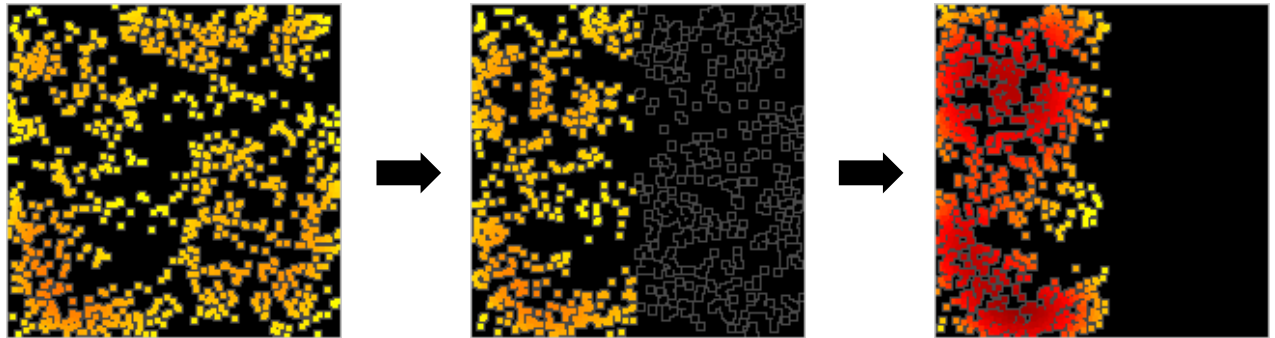
- The Wright–Fisher model:
 - enforces a given population size
 - no concept of *local* density-dependence

Continuous Space and nonWF

- The Wright–Fisher model:
 - enforces a given population size
 - no concept of *local* density-dependence
- nonWF models:
 - local density-dependence is *emergent*
 - population size responds naturally
- Spatial models should be nonWF models!

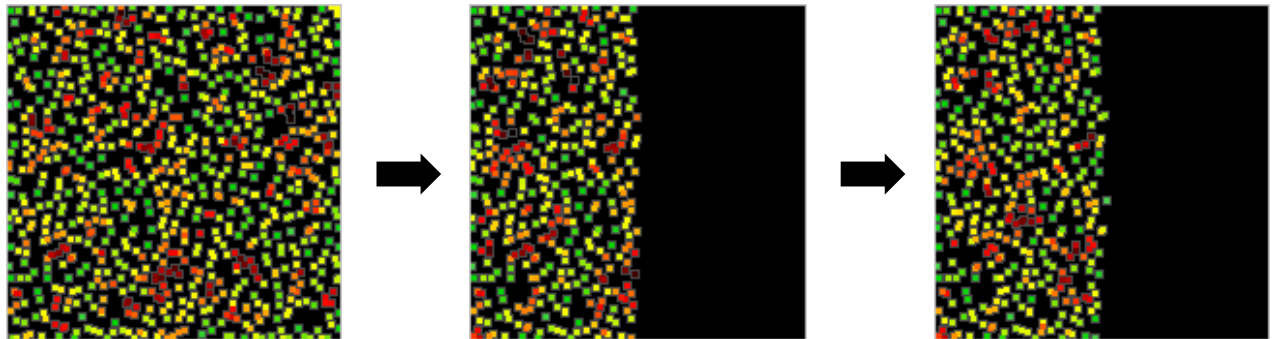
Local density-dependence

WF:



after an extinction event, local density is doubled

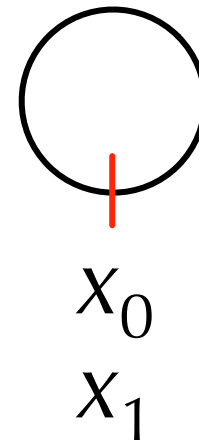
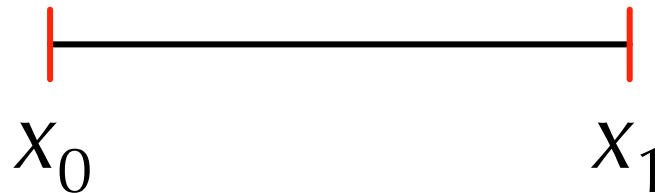
nonWF:



after an extinction event, local density is maintained

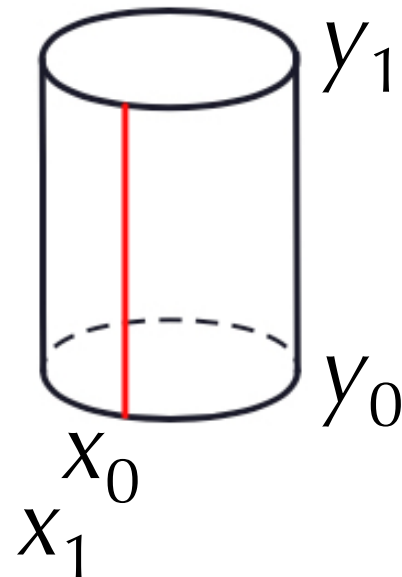
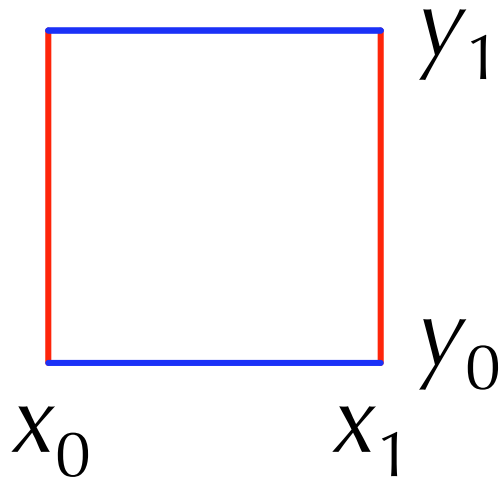
Periodic Boundaries

- A coordinate axis wraps around
- Continuous and uniform: no seam
- Eliminates artifacts due to edge effects



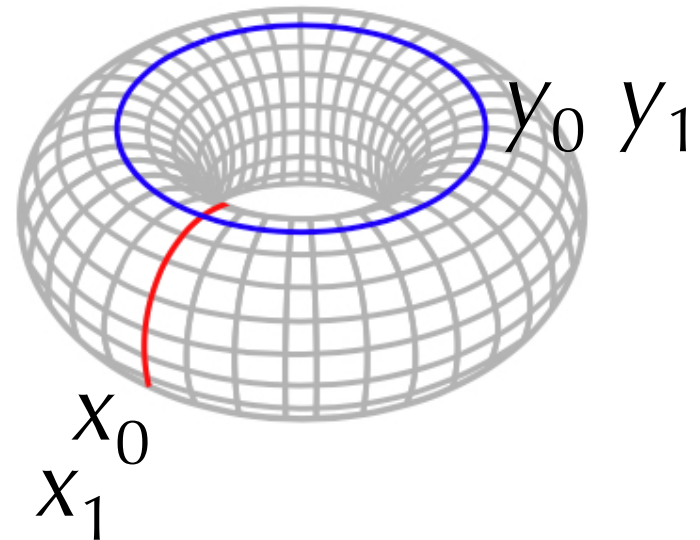
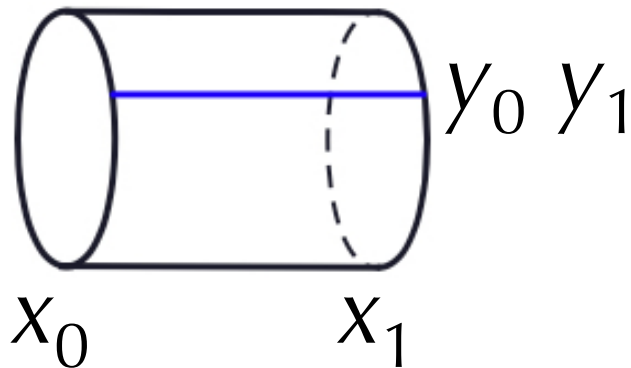
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Periodic Boundaries

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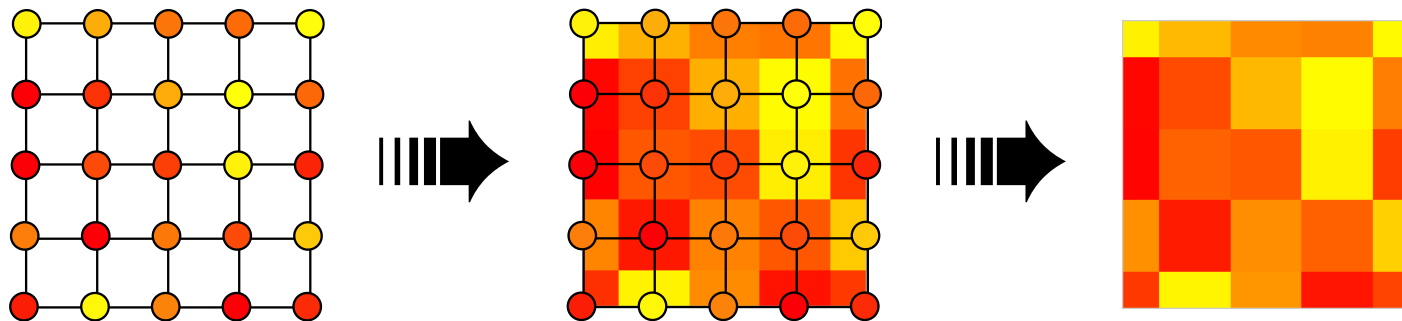


Periodic Boundaries

- A coordinate axis wraps around
- Continuous and uniform: no seam
- Eliminates artifacts due to edge effects
- Can be ideal for theoretical models
- Also, models with a large landscape

Spatial Maps

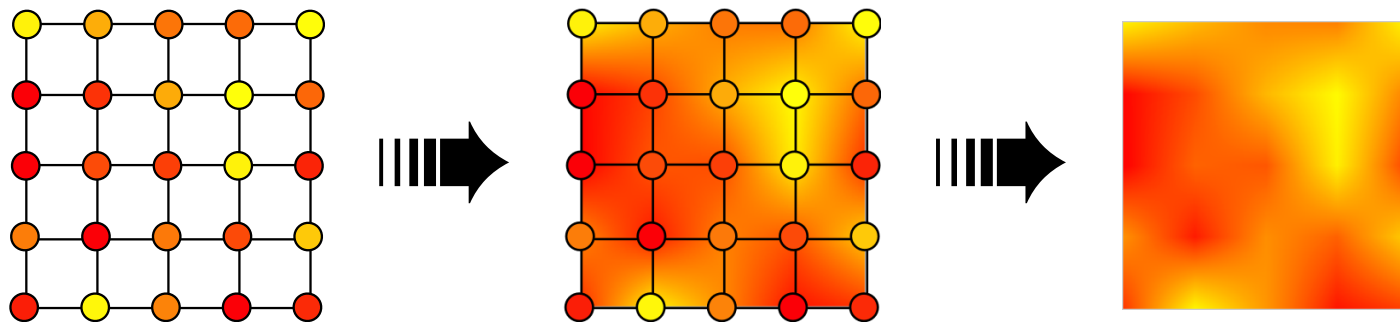
- A grid of defined values is overlaid
- Interpolation can be enabled



without interpolation

Spatial Maps

- A grid of defined values is overlaid
- Interpolation can be enabled



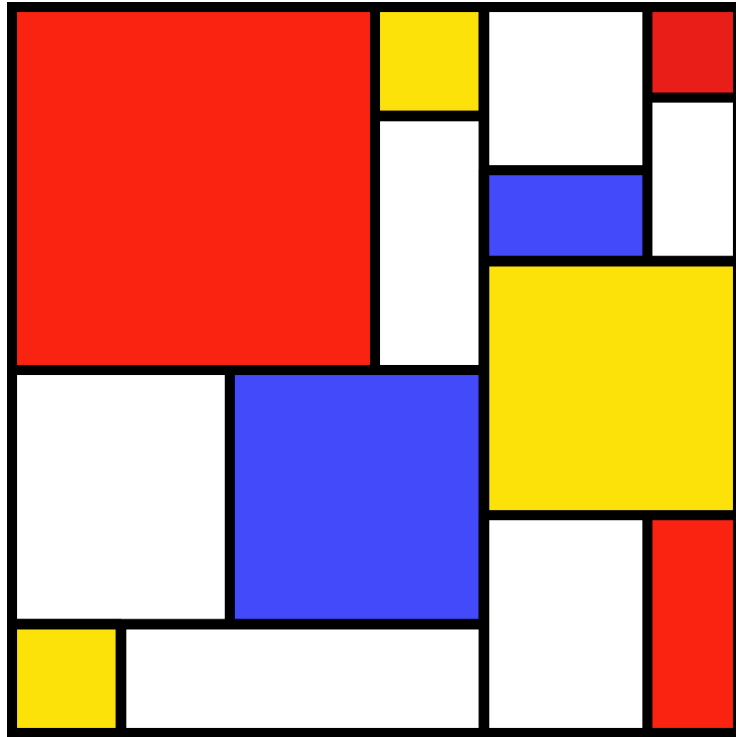
with interpolation

Spatial Maps

- A grid of defined values is overlaid
- Interpolation can be enabled
- These values might represent:
 - habitability (carrying capacity, fecundity)
 - an optimum phenotypic value
 - an environmental variable (elevation, etc.)
 - a model parameter (dispersal distance)

Spatial Maps

- Can be changed at any time
 - seasonal changes in the landscape
 - climate change models
- SLiM-Extras has useful stuff:
 - spatially autocorrelated landscape maps
 - algorithmic habitat map generation



SLiM Workshop Exercise #19