MEMO 05

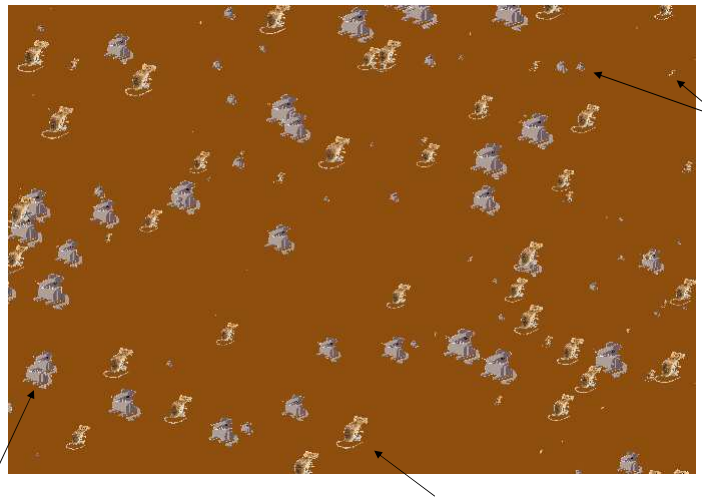
Sensitivity analysis of (i) **population max size** and (ii) **time before extinction** to the rodent agents' longevity parameter and three types of domain heterogeneity.

Module: SimMasto0h - Février 2011 – J.Le Fur/J.-E.Longueville

1

Simulation context

Example: Homogeneous surface, t=239

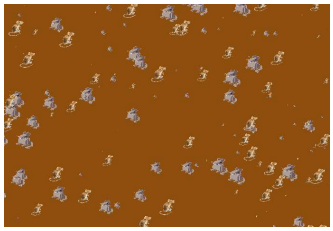


Reproduction occurs if mature male and female encounter within reproduction season

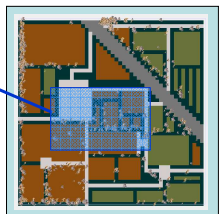
2

Two types of landscape heterogeneity

Homogeneous test grid (serie name: *homogene*)



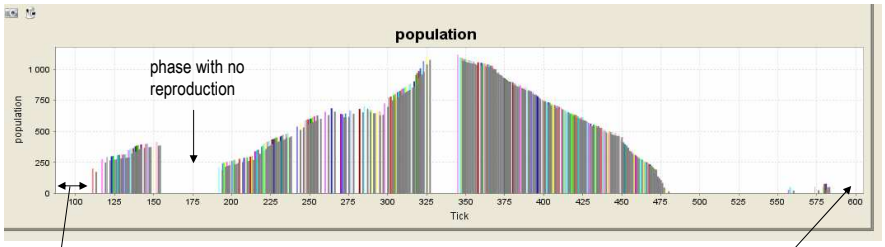
Heterogeneous (viz. fields) test grid (serie name: *grilleTest*)



Whole domain simulated

3

Example of one run : longevity = 153 (about 6 months simulated), homogeneous environment, N_0=200)

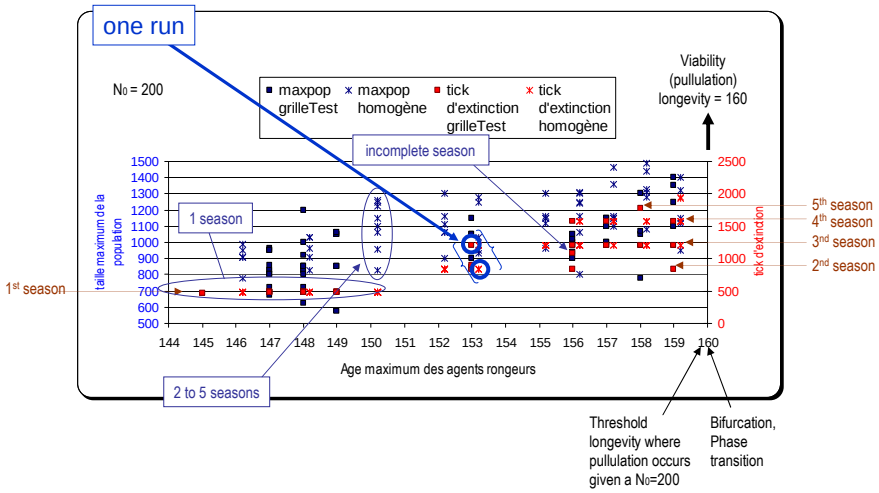


Parents maturation

extinction (t=580)

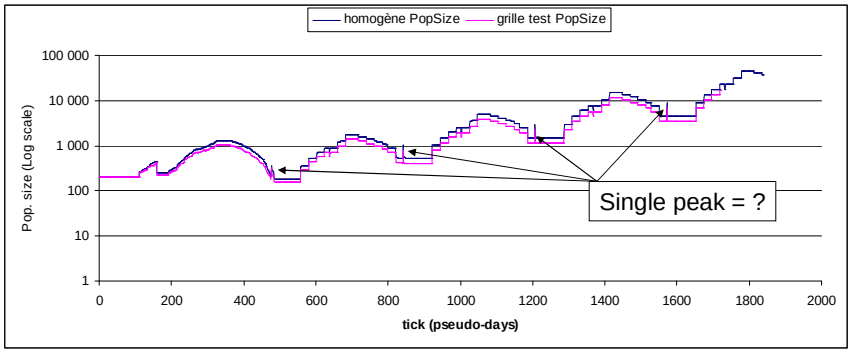
4

Variability of maximum population size and extinction time for differing value of rodent agents' longevity



5

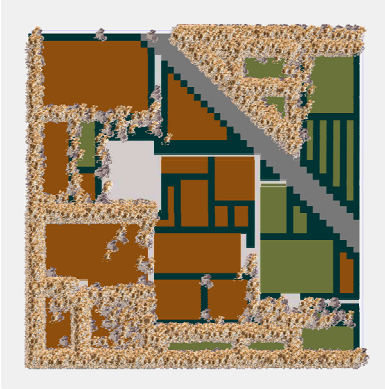
Longevity = 160: Viable/pullulating population



6

Viable/pullulating population (cont.): heterogeneous environment

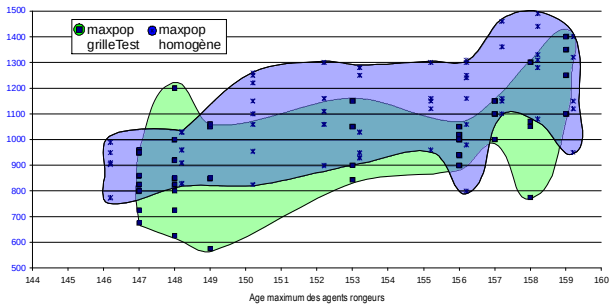
longevity:159,tick=1401



longevity:160,tick=1819

7

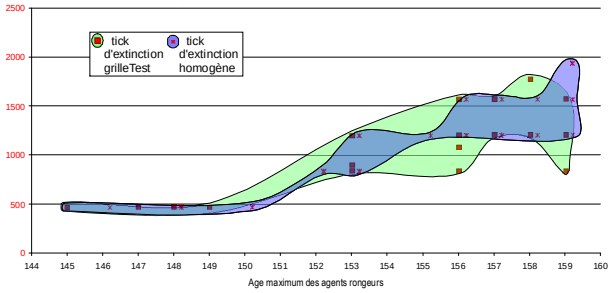
Similar envelopes of variation obtained for the two types of landscape :



← Max population

Extinction time ↓

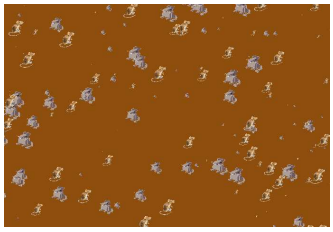
No visible effect on maximum population size nor tick of population extinction



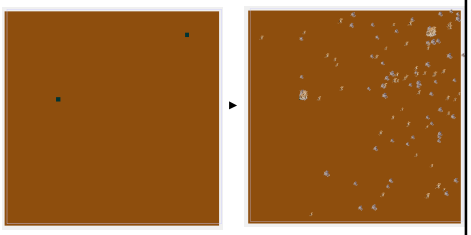
8

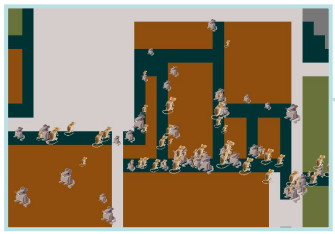
Varying domain heterogeneity

Homogeneous test grid

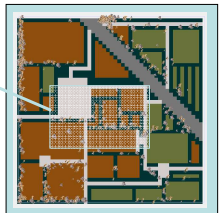


Spotted (viz. colonies) test grid : **validation**





Heterogeneous (fields) test grid



Whole field simulated

No visible effect on maximum population size nor tick of population extinction (longevity = 153)

Note: more simulation is necessary for the spotted field test case

9

17.02.11 - simulation SimMasto_0h – simulation conditions

- 1 tick = 1 minute (temporary, in fact 1min assimilated to one day)
- REPRO_START_Utick = 91;
- REPRO_END_Utick = 305;
- ANNUAL_CYCLE_Utick = 365
- MALE = 0;
- MALE_SEXUAL_MATURITY = 60;
- MALE_SEXUAL_MATURITY_TIME_UNIT = "minute"; // Rattus rattus 75 day
- FEMALE = 1;
- FEMALE_SEXUAL_MATURITY = 60
- FEMALE_SEXUAL_MATURITY_TIME_UNIT = "minute"; // Rattus rattus 75 day
- GESTATION_LENGTH = 21;
- GESTATION_LENGTH_TIME_UNIT = "minute"; //"day";
- LITTER_SIZE = 2;
- MATING_LATENCY = 0;
- MATING_LATENCY_TIME_UNIT = "minute";
- NUMBER_OF_AGENTS = 200;
- CELL_WIDTH_UMETER = 4.473; // m.px^-1 Un pixel d'un raster = une cellule d'une matrice
- UCS_WIDTH_UMETER = 4.473; // m.cs^-1 Facteur de conversion unité de continuous space => mètres.
- SPACE_CELL_SIZE_UCS = 1; // cs.cell^-1 (float) PIXEL_WIDTH_UMETER;

- raster_url ="data_raster/grille-test.1a.txt";

10