

Agent-based modelling of canopy rate for the canton of Geneva

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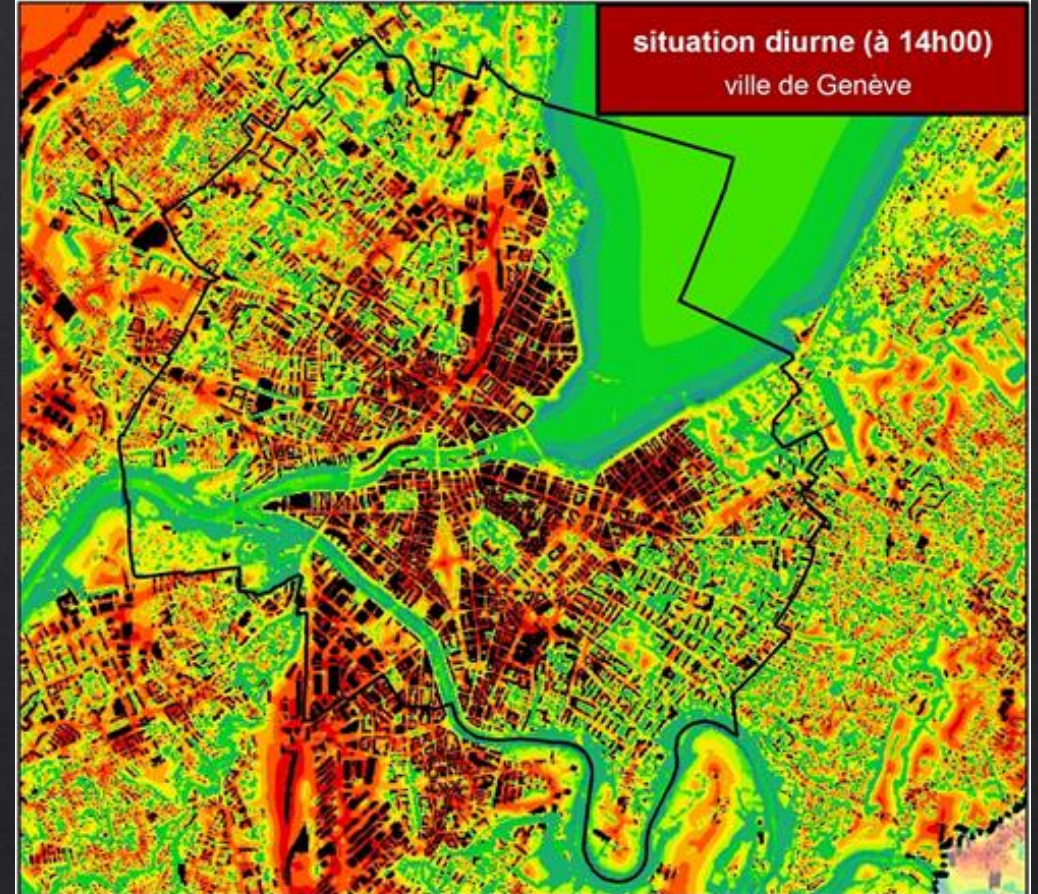
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Heat islands

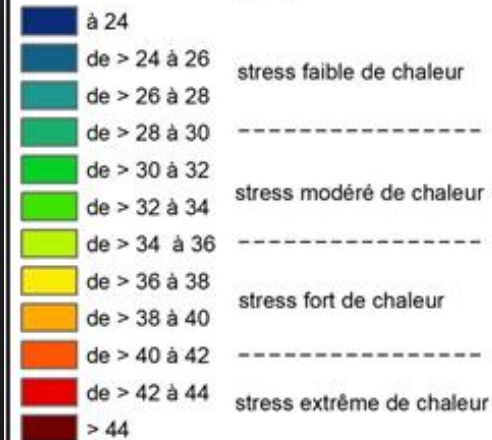


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Temperature $> 21\text{ }^{\circ}\text{C}$: tropical night !



PET à 1,1 m du sol ($^{\circ}\text{C}$)



Divers



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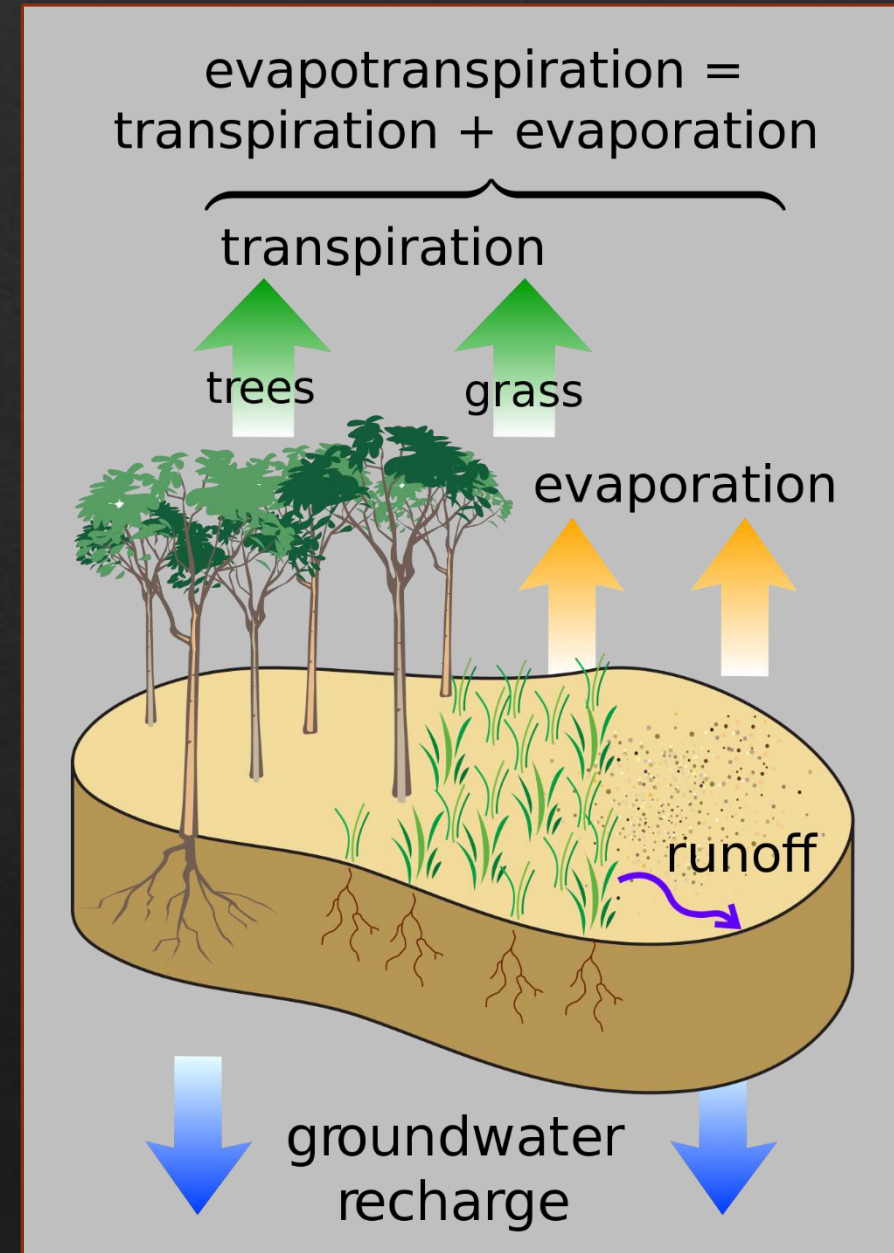
échelle: 1: 50.000



Evapotranspiration

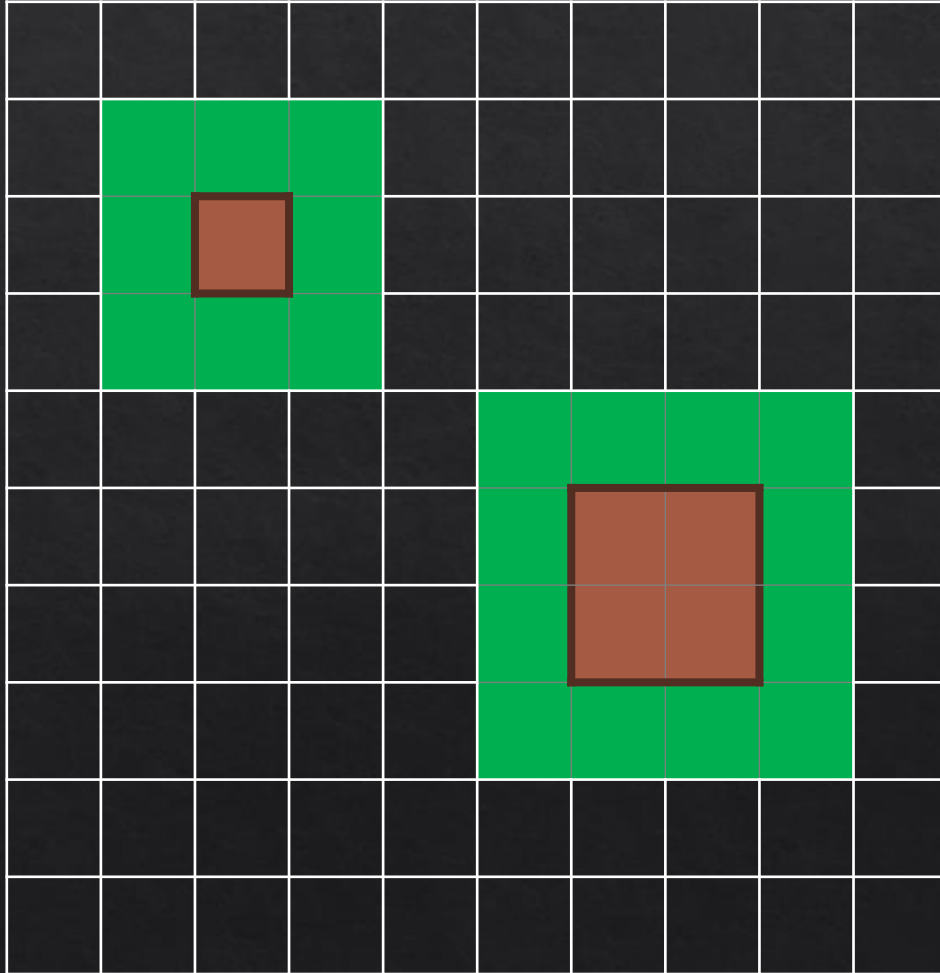


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Canopy rate



Canopy rate :

$$\frac{9+16}{100} = 25\%$$

Goals of our project

- ◆ Tree growth modelling and canopy growth modelling.
- ◆ Canopy rate prediction for the year 2050.
- ◆ Quantifying the cooling effect of the canopy : now, and in 2050.
- ◆ Using these predictions, check compatibility with goals set by policy-makers for the canton.

Strengths and limitations of ABM

A non exhaustive list

Strengths

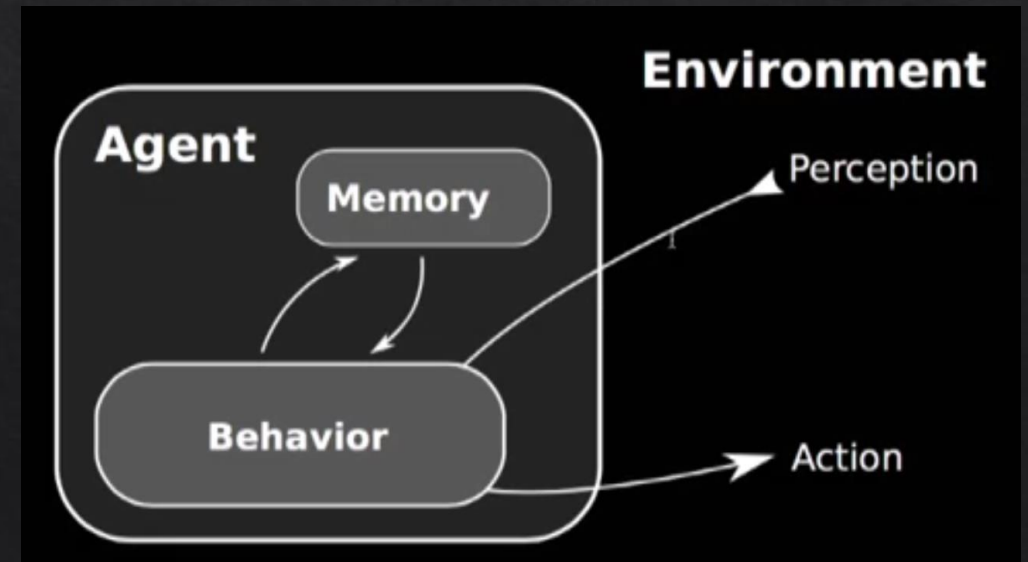
- ◇ Micro-level modelling of each individual.
- ◇ Interaction with other agents and their environment.
- ◇ Simple rules of evolution can lead to emergence of complex patterns at the macro level.

Limitations

- ◇ Need for large amounts of data, of great quality.



- ◇ Need for a deep understanding of the system.
- ◇ Strong computational power may be required.



Results

Canopy extent



GAMA

GAMA is a modeling and simulation development environment for building spatially explicit agent-based simulations.

Results

Temperature



Project initiated by Prof. Giovanna Di Marzo Serugendo (CUI), for Mr Bertrand Favre (OCAN).

Sources

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