

CAN SOME SPECIFICITIES OF THE RESOURCES ENCOURAGE MUTUAL AID?

E. Delay, C. Piou

CIRAD – UPR GREEN & UMR CBGP



Université
de Limoges

Overview

1. To the sources of reflection
2. Implementation in ABM
3. Some key results
4. Conclusion

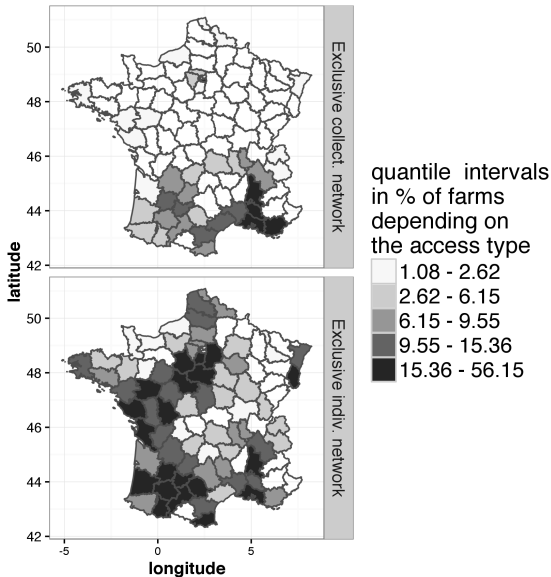
TO THE SOURCES OF REFLECTION

Interdisciplinary dialogue

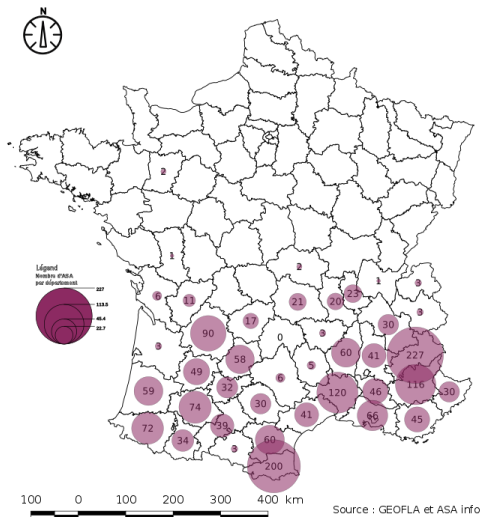
- Cyril PIOUS - CIRAD CBGP - work in the acridology
- Etienne DELAY - Univ. Limoges - work on dam social influence in the Pyrénées-Orientales region



From irrigation and water scarcity

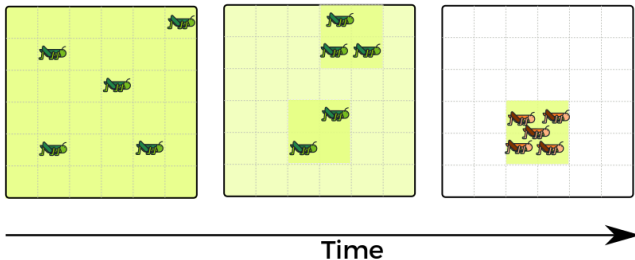


A special governance shape



Meanwhile in a galaxy far, far away...

How it works in achridology



COLLETT et al. 1998

let's get back to our business

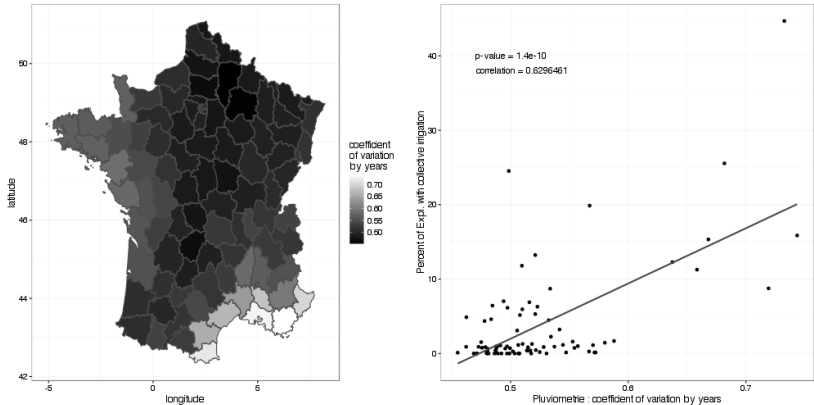


Figure: Coefficient of variation of monthly rainfall between 1901 and 2017 (source CRU)

Cooperation and competition are they compatible ?

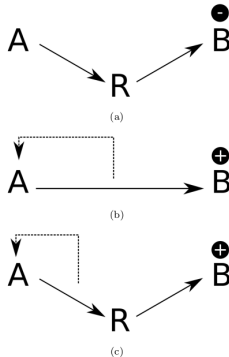


Figure: Competition \rightarrow agent A acts upon a resource (R) that generate a negative impact on a second agent B ((a) ; e.g.(Keddy, 2001)). Cooperation (West et al.,2007) \rightarrow a behavior of A impacts B positively and a selection process exist on this behavior (b). Our proposition (c) cooperation is to base the interaction upon a resource so compatible with the formalism proposed in (a).

IMPLEMENTATION IN ABM

Implementation context

PURPOSE

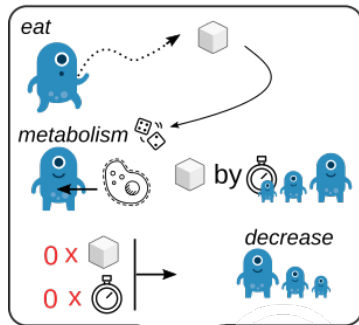
The objective was to explore how the spatial distribution of agents under spatial and temporal variability of resource accessibility affected their own interests in cooperation.

NOTES

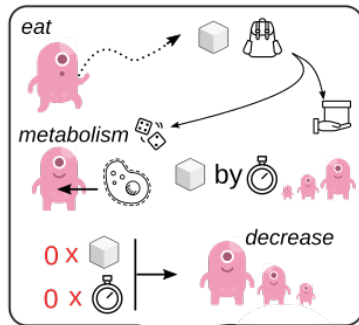
The model was motivated by reality but we chose to develop a **PURELY ABSTRACT MODEL** inspired by the Epstein and Axtell (1996) “**SUGARSCAPE**” model.

Process overview and scheduling

Without cooperation



Cooperation

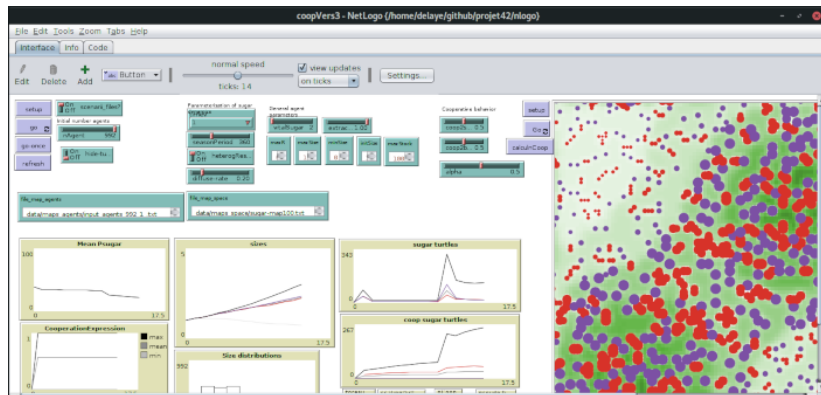


Environment



Implementation of our model

What is looking like in NetLogo?



Exploration

looking for :

- diffusion rate
- resource time variation
- agents spatial distribution
- cooperative behavior influence (C2B et C2S).

Exploration management :

- upscale exploration with 21 600 replication in OpenMole
- manage data with R

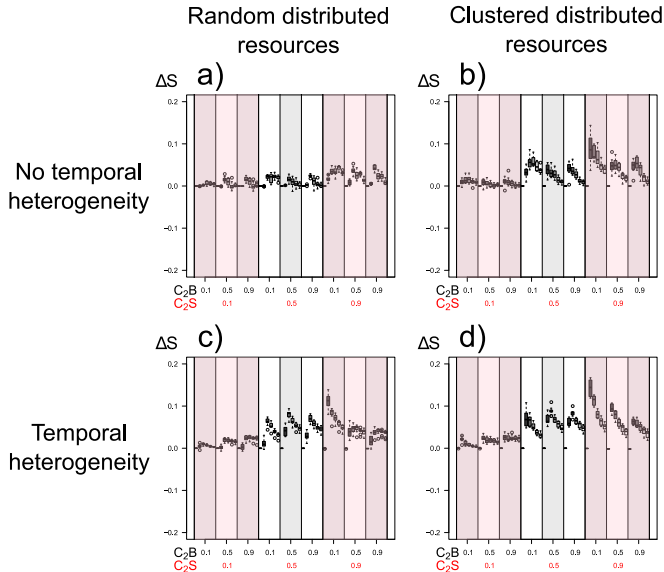


OpenMOLE
openmole.org

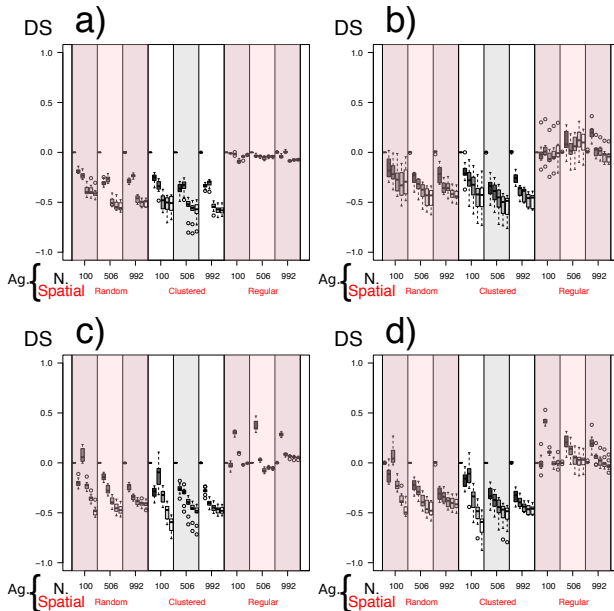


SOME KEY RESULTS

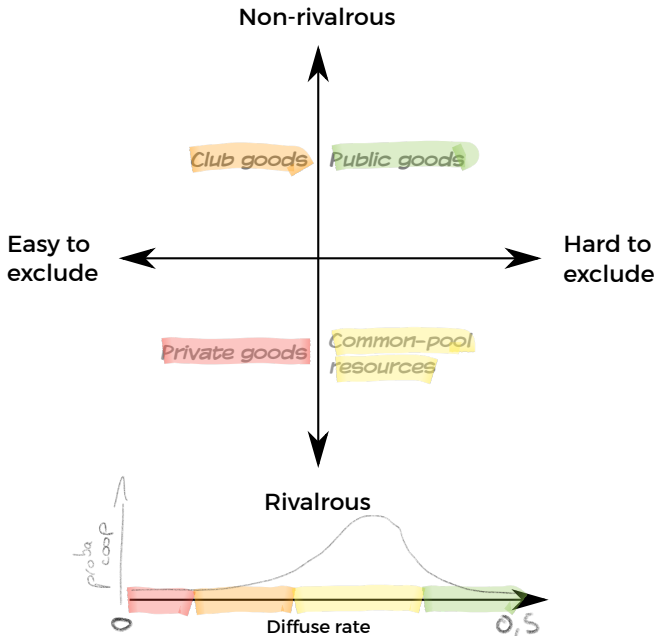
Spatial and temporal resource variability on ΔS



Spatial and temporal resource variability on DS



A special attention on the diffusion rate



A compass to look for the Keys commons

In a situation of proven mutual aid ?

(enter through the collective)



A compass to look for beneficial environment

In a situation of "scarcity" (Bookchin 1972)?

(enter through the resources)



CONCLUSION

Global results

After S. SPRINGER (2016), we consider, "*the common good is always a geographical manifestation of mutual aid*" →

- Spatial and temporal resource heterogeneity encourages mutual aid,
- considering *dr* as accessibility to the resource, theoretical model can be used to compass in the real world

How to encourage diffusion of collective management practices
?



Regarding the white book "*The opportunities and challenges presented by a land-based commons approach*" provide by CTFD, reconsider our model to understand and explore "commons approach" principle.

Technical Committee on "Land Tenure and Development"

**The opportunities
and challenges
presented by a land-based
commons approach**



let's have fun !

Let start with serendipity, and improve with collective action!



Thank you for your attention



You can find this presentation on [github](#)

