

# Towards functional groups of mountain socio-ecological systems

Isabelle Boulangeat, Coralie Achin, JF Ruault, Enora Burley, Fred Bray

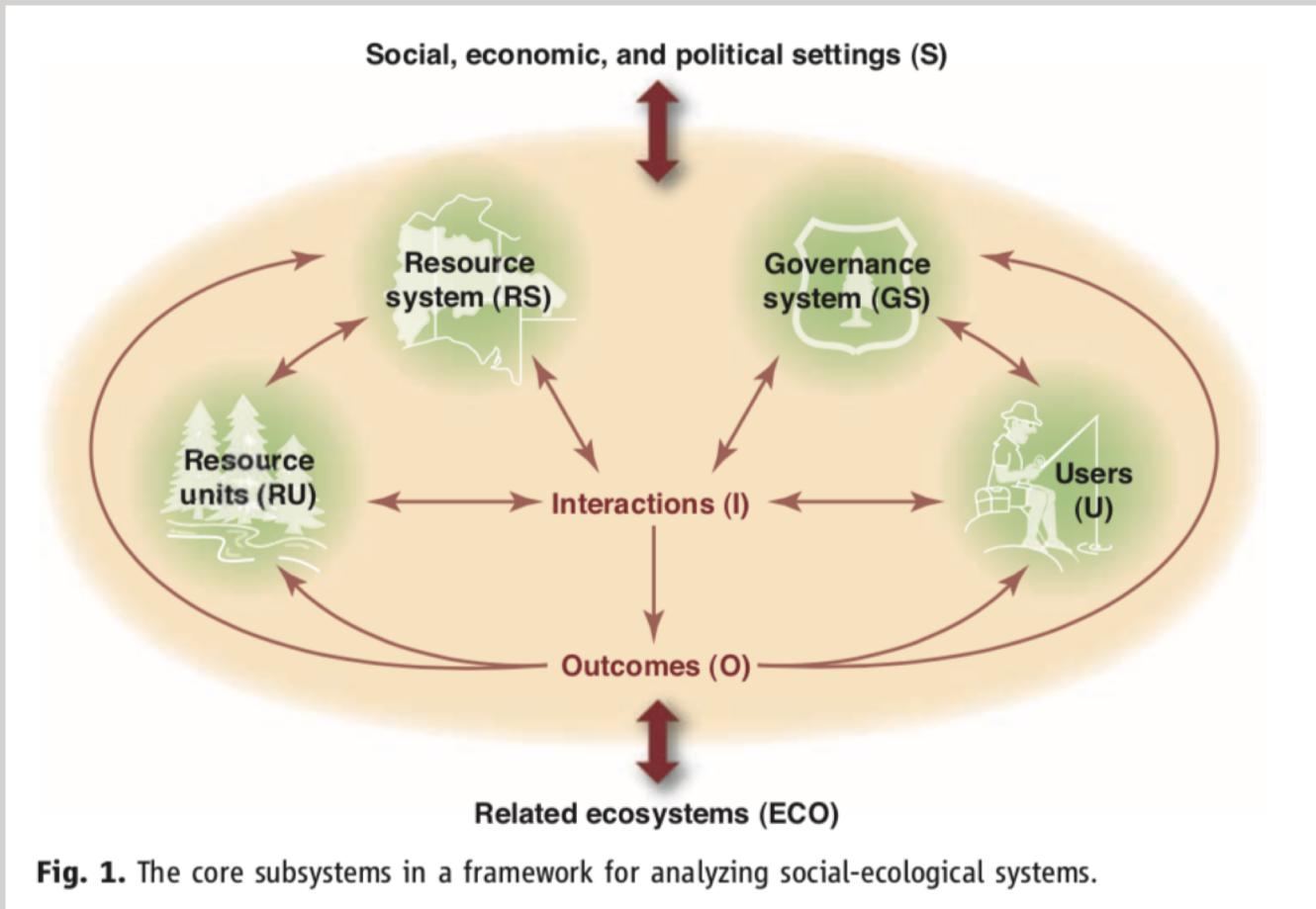
*LESSEM, INRAE, Grenoble*

*LECA, CNRS, Grenoble*

## OBJECTIVES

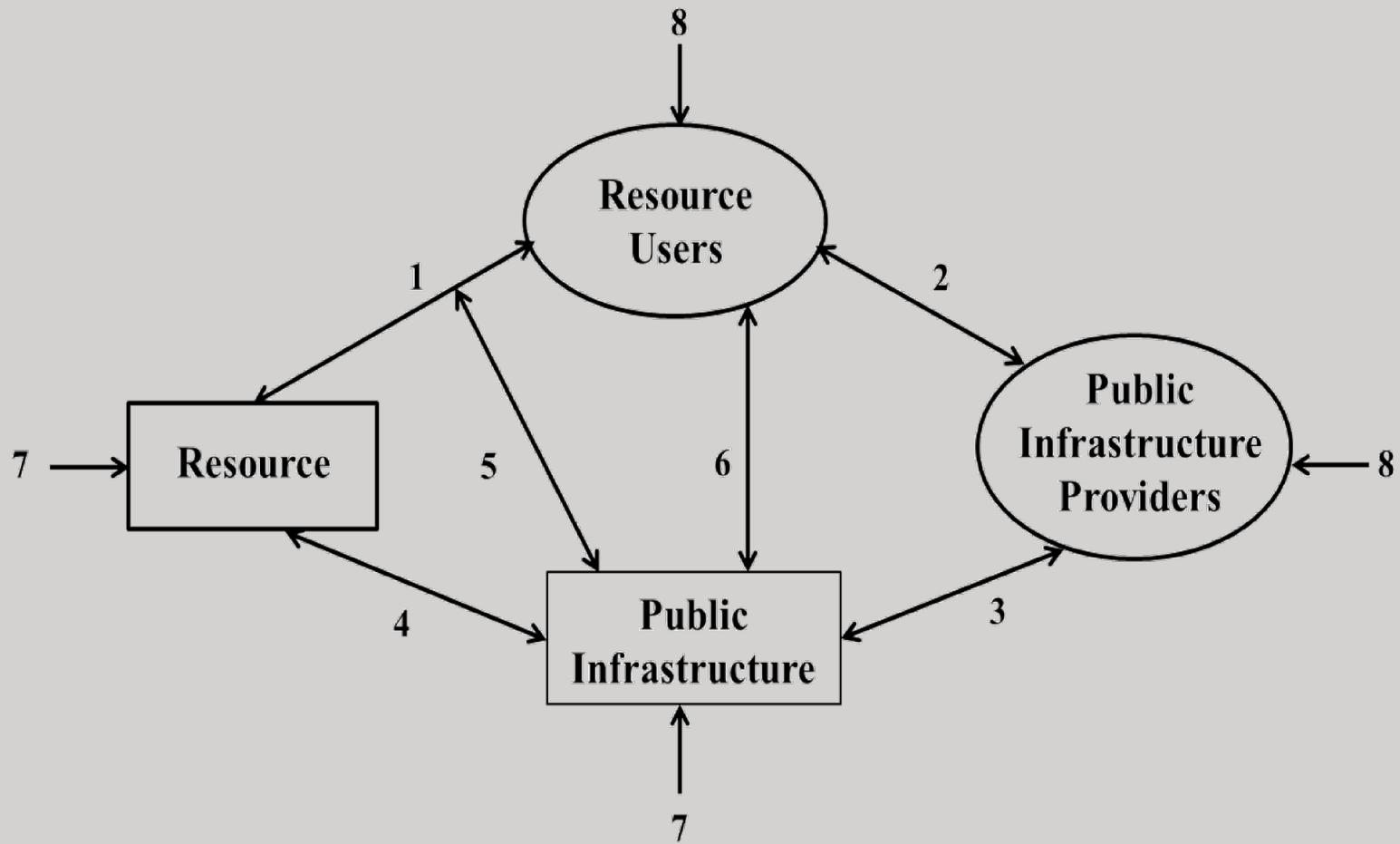
1. Build an interdisciplinary database
2. Identify functional attributes of municipalities
3. Develop different perspectives on the French Alps LTSER

# VARIABLES' ORGANISATION



Ostrom 2009, Sciences ; Vogt et al. 2015 Ecology and Society

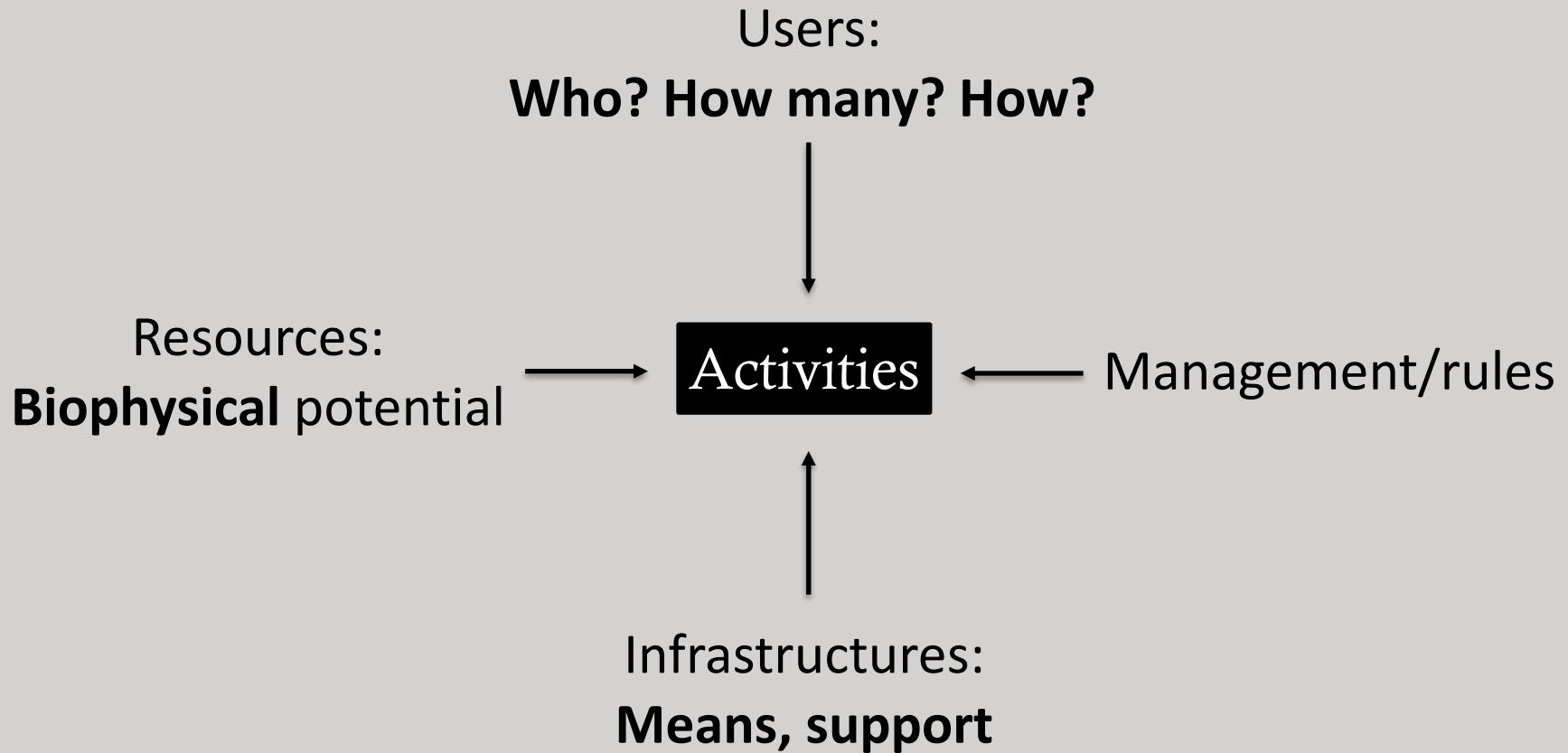
# VARIABLES' ORGANISATION



Anderies 2004, The robustness framework

# VARIABLES' ORGANISATION

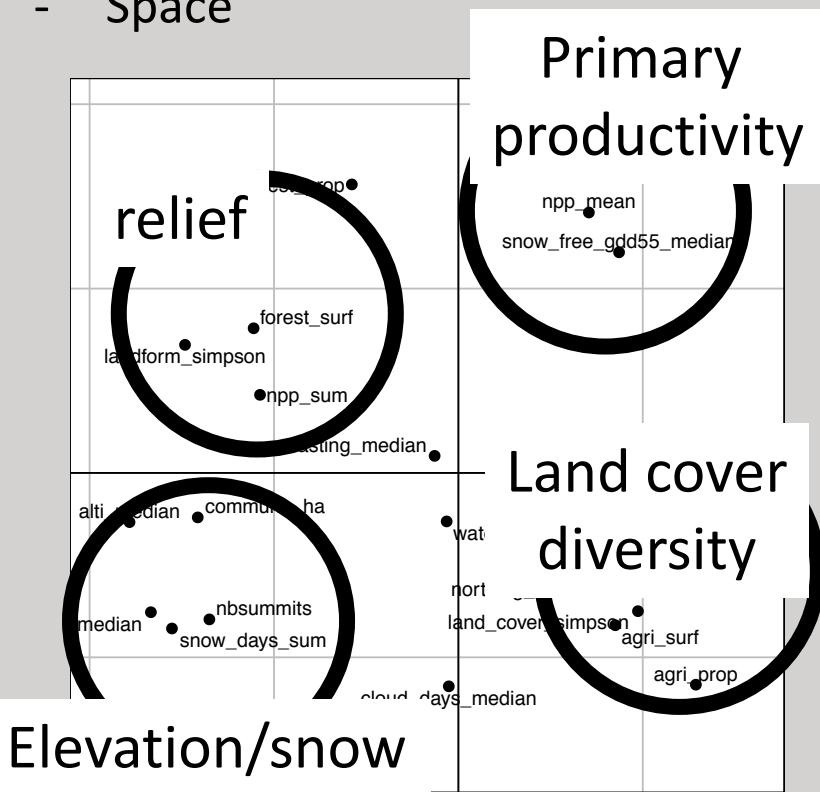
---



# A BIOPHYSICAL PERSPECTIVE

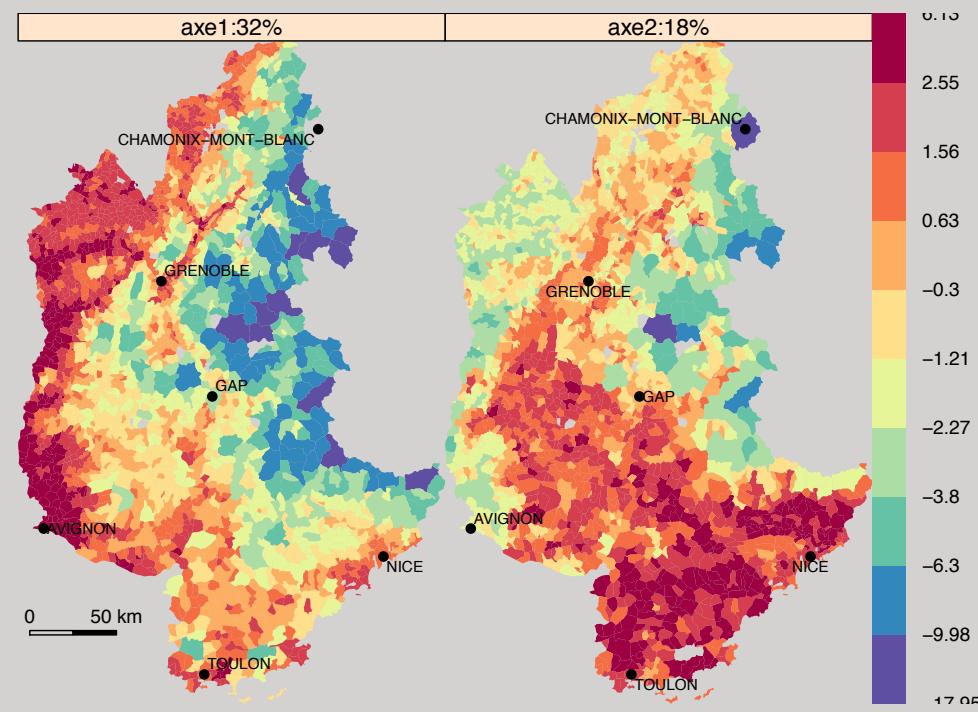
## Potential for ecosystem services

- Drivers of plant productivity
- Drivers of species diversity
- Elements for touristic activity
- Elements for forestry/agriculture
- Space



## Variables

- Primary productivity
- Landform (relief, diversity)
- Land cover (water, forest, fields, diversity)
- Climate (gdd, snow, sun)



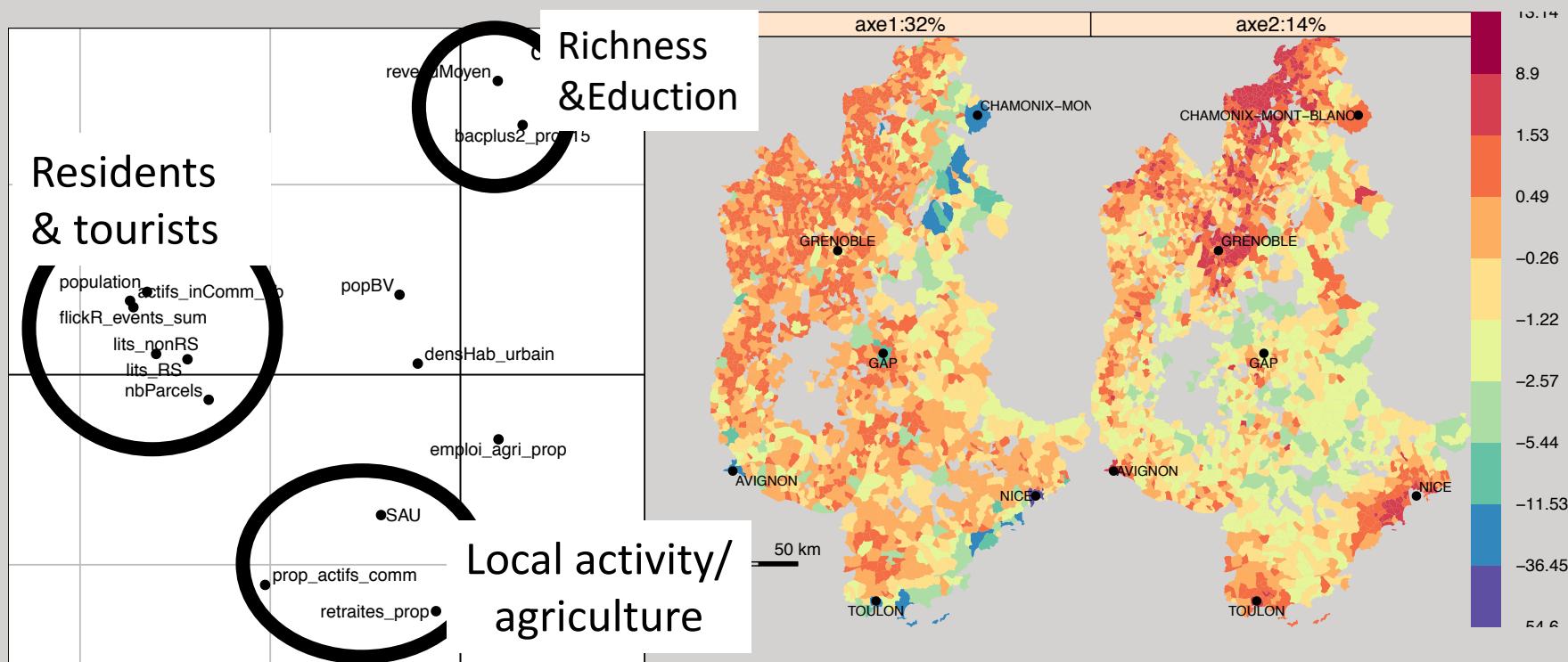
# A USERS PERSPECTIVE

Characterize users

- Quantity
- Quality
- Type of activities

Variables

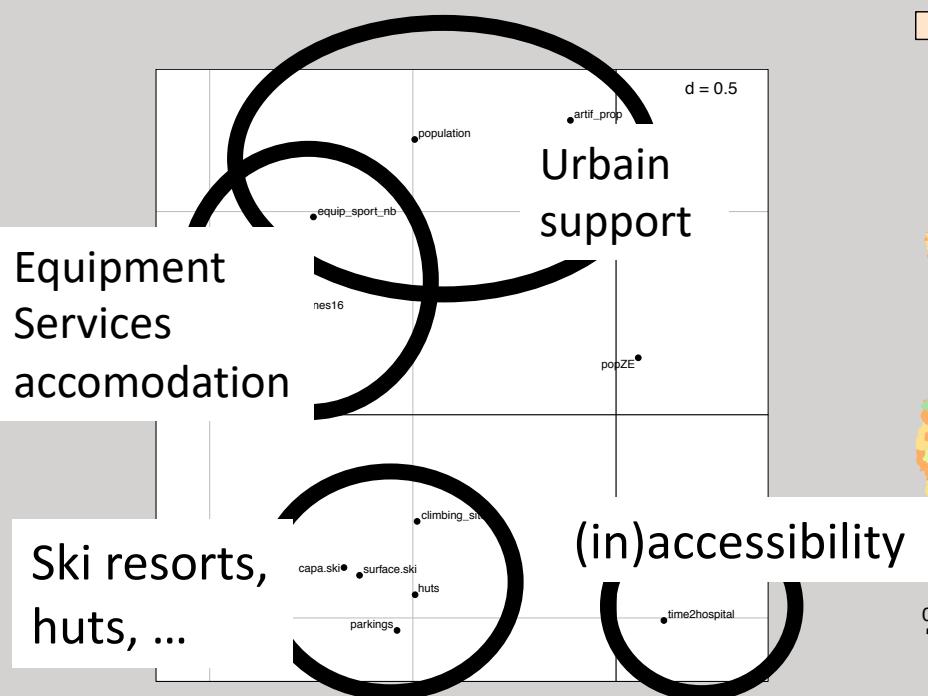
- Residents and tourists, regional population
- Habitat density, SAU
- Education, richness
- Proportion of employment per category (e.g. in agriculture)



# A INFRASTRUCTURE PERSPECTIVE

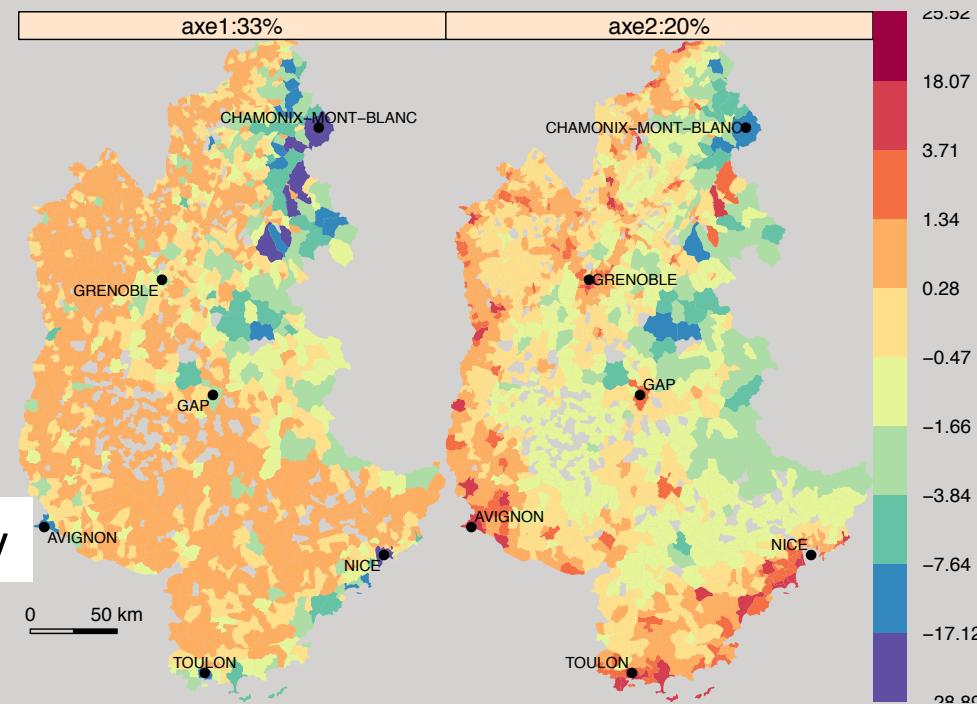
## Soft and hard infrastructures

- Services
- Hosting
- Equipment
- People
- Geographic accessibility



## Variables

- Services
- Population and hosting capacity
- Parkings, roads, isolation
- Ski resorts
- Huts, climbing sites



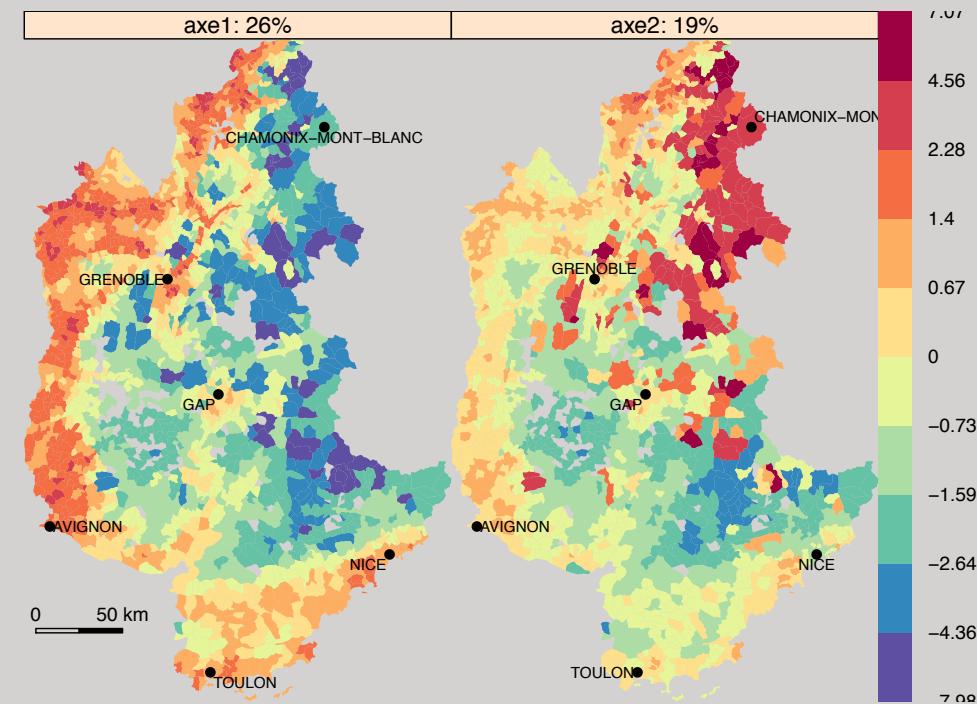
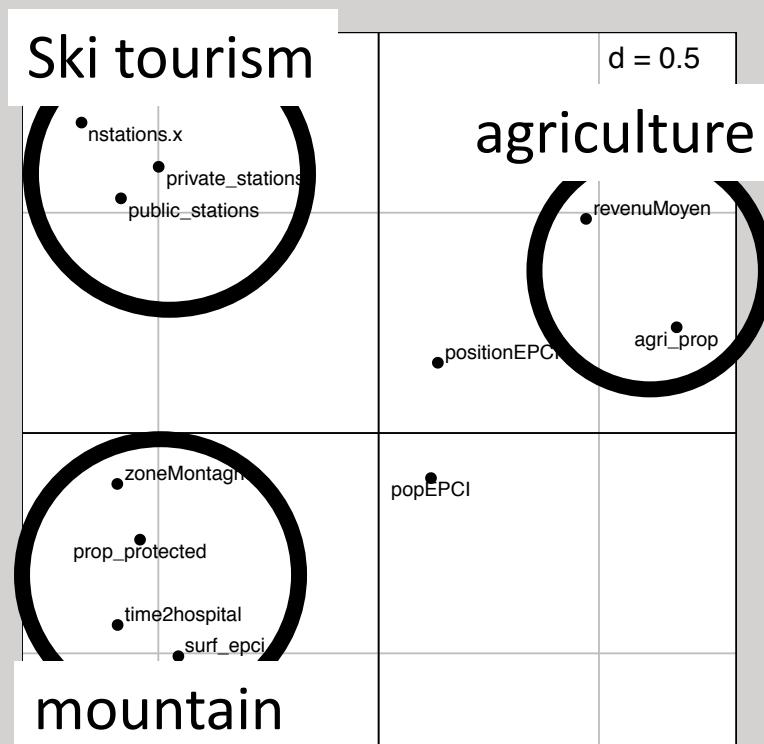
# A MANAGEMENT PERSPECTIVE

## Constraints on management

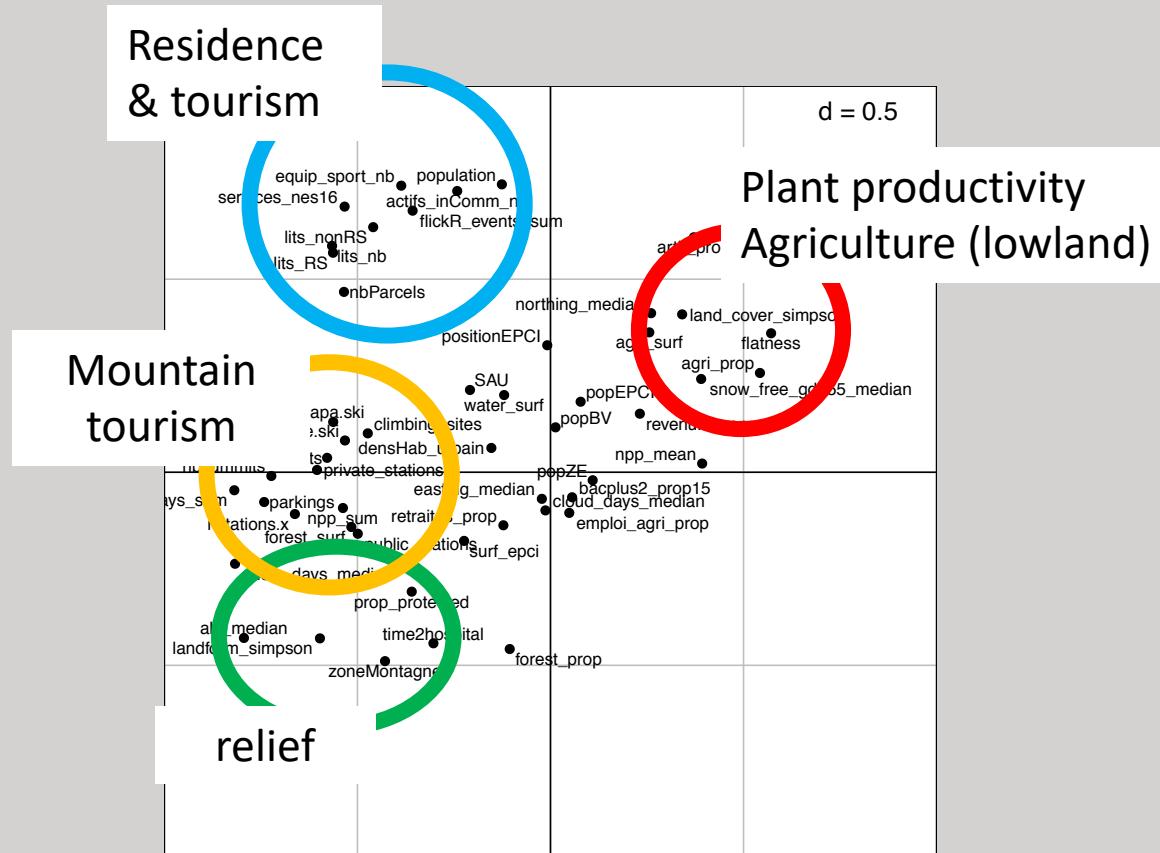
- Scale of influence, dependence
- Dependence, autonomy
- Private or public management

## Variables

- Mountain label for law
- Protected areas
- Isolation
- Local influence, position



# SOCIO-ECOSYSTEMS



# PERSPECTIVES

---

- Functional characterization of municipalities
- Functional groups
- Select representative sites
- Contextualise a focal municipality
- Illustrate potential temporal trajectories of municipalities (under climate change or socio-economic scenarios)



ibou langeat



@DrIsaBlg

<https://ibou langeat.github.io>