



## PaSim - Pasture Simulation Model

Katja Klumpp, Romain Lardy, Anne-Isabelle Graux, Gianni Bellocchi,  
Raphaël Martin

### ► To cite this version:

Katja Klumpp, Romain Lardy, Anne-Isabelle Graux, Gianni Bellocchi, Raphaël Martin. PaSim - Pasture Simulation Model. International Symposium on Soil Organic Matter, Jul 2011, Leuven, Belgium. , 1 p., 2011. hal-02808820

HAL Id: hal-02808820

<https://hal.inrae.fr/hal-02808820>

Submitted on 6 Jun 2020

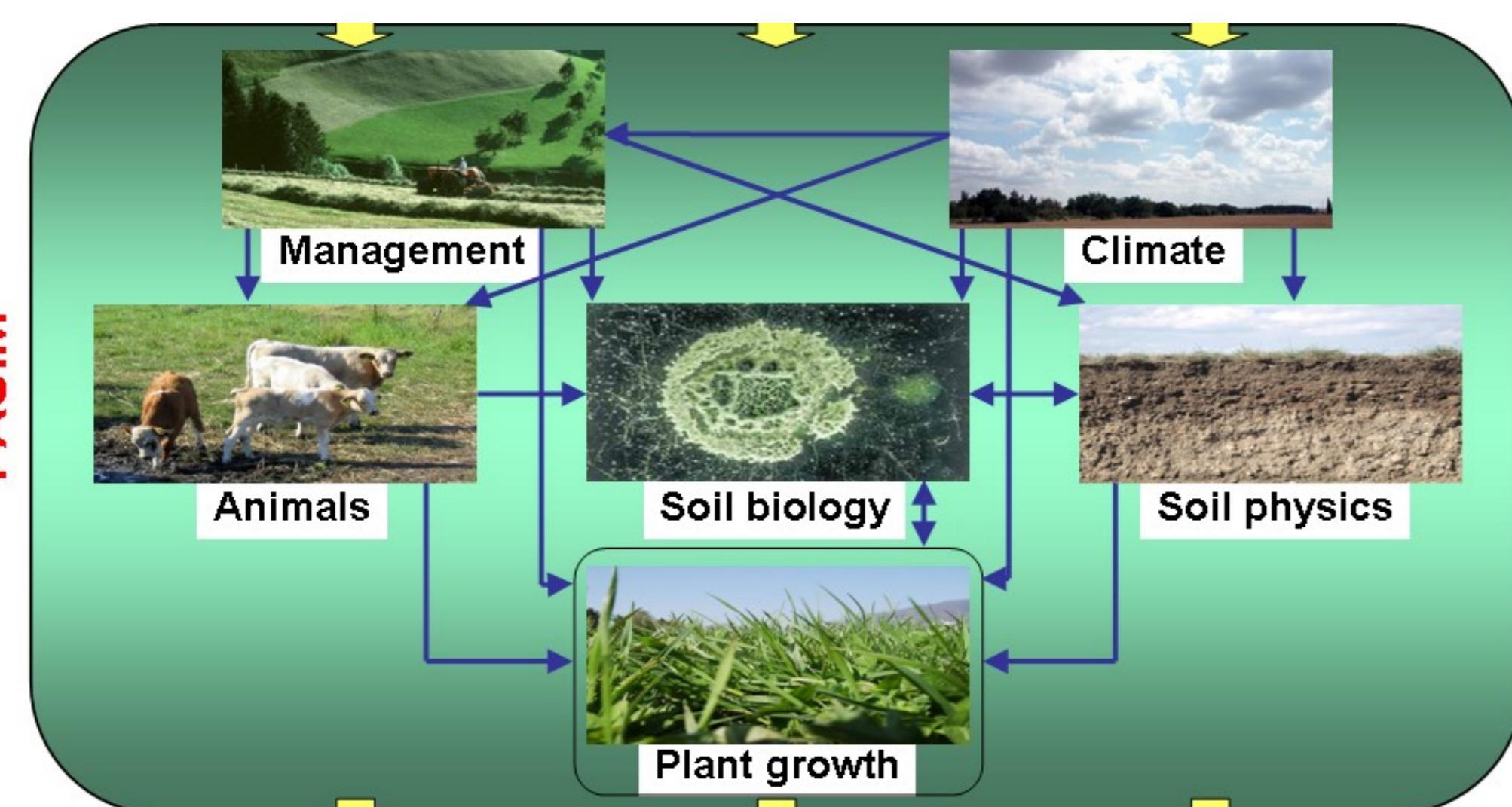
**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

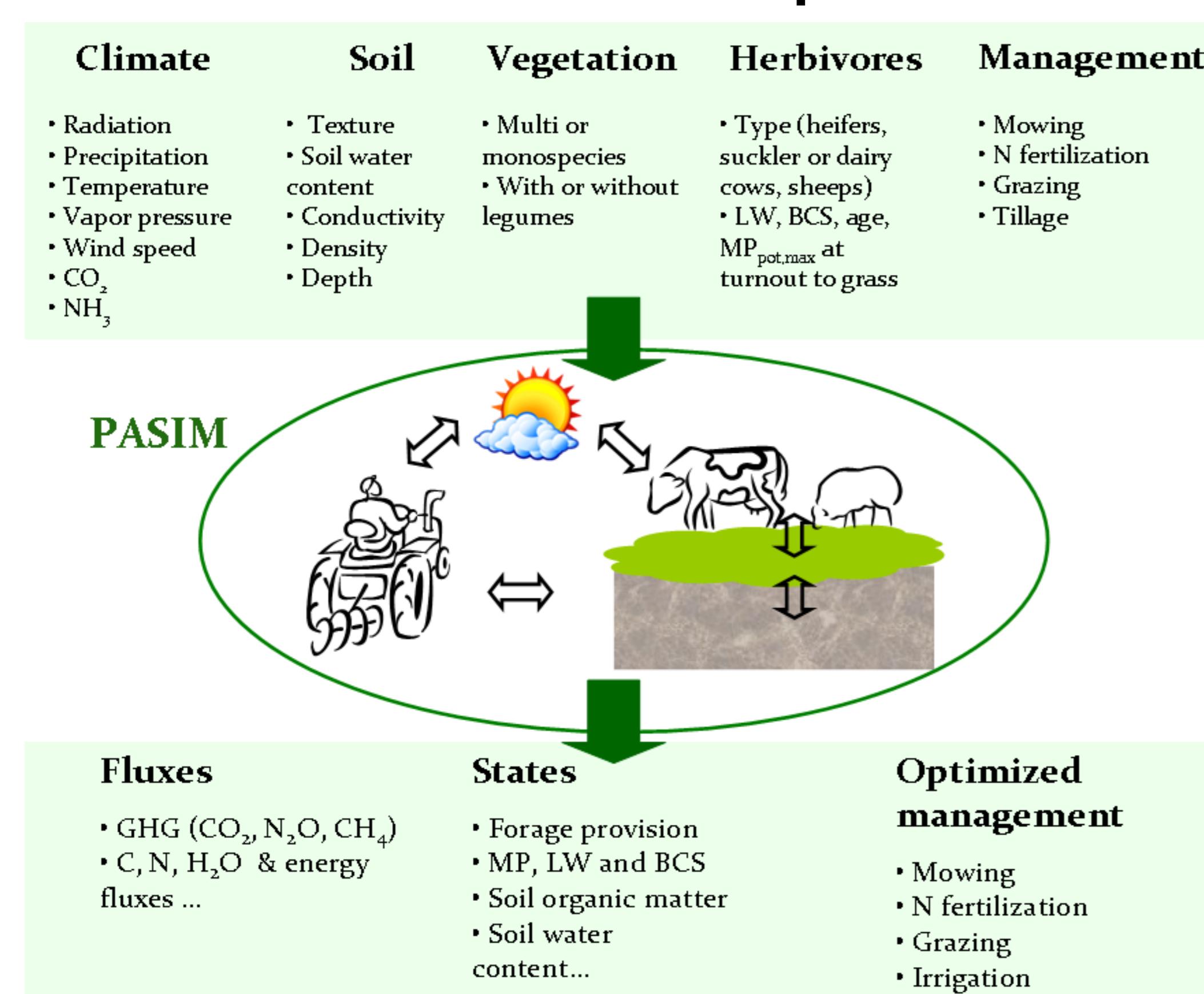
# PaSim - Pasture Simulation Model

INRA, UR0874, Grassland Ecosystem Research Unit, 234 Avenue du Brézet, 63100 Clermont-Ferrand, France  
<https://www1.clermont.inra.fr/urep/modeles/pasim.htm>

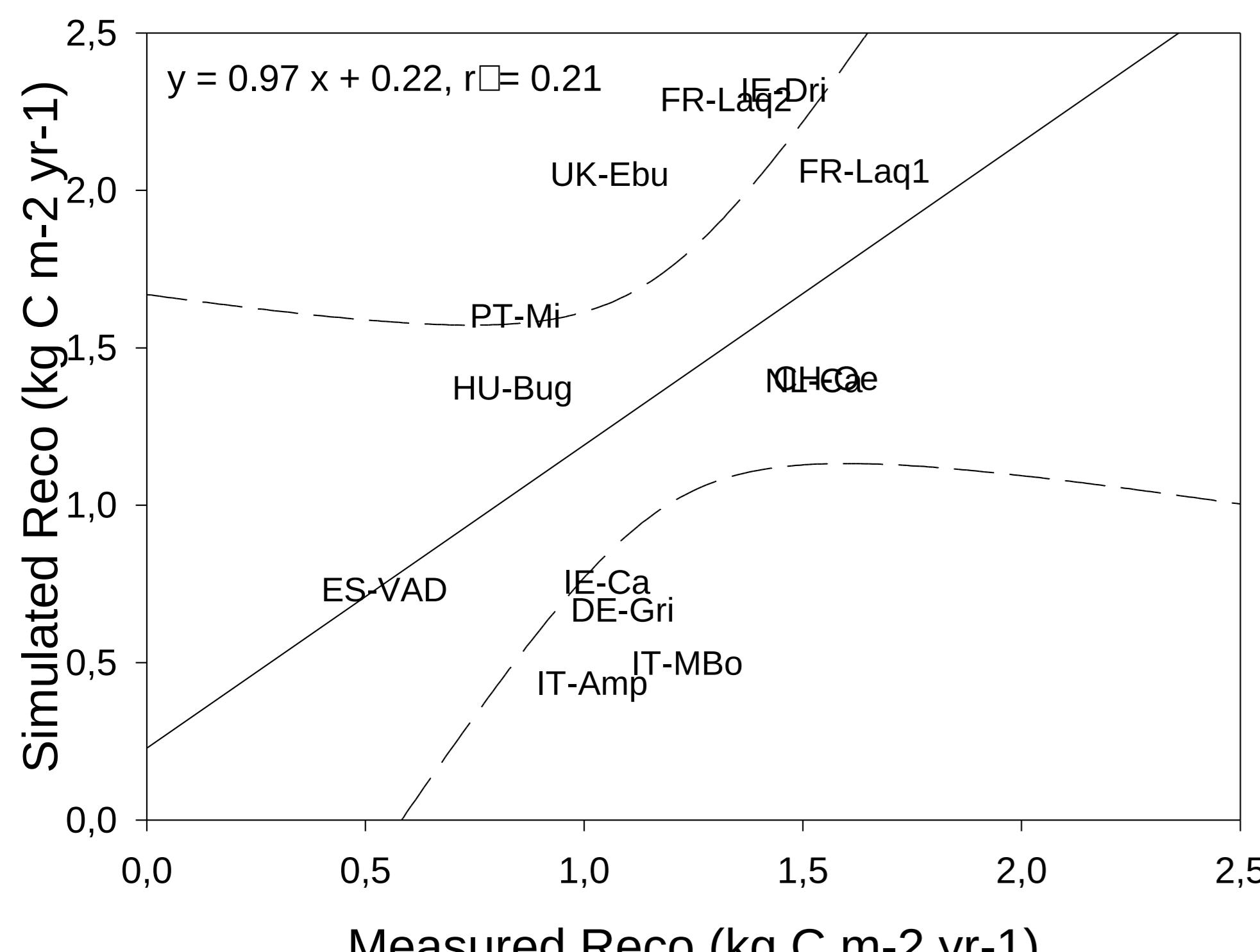
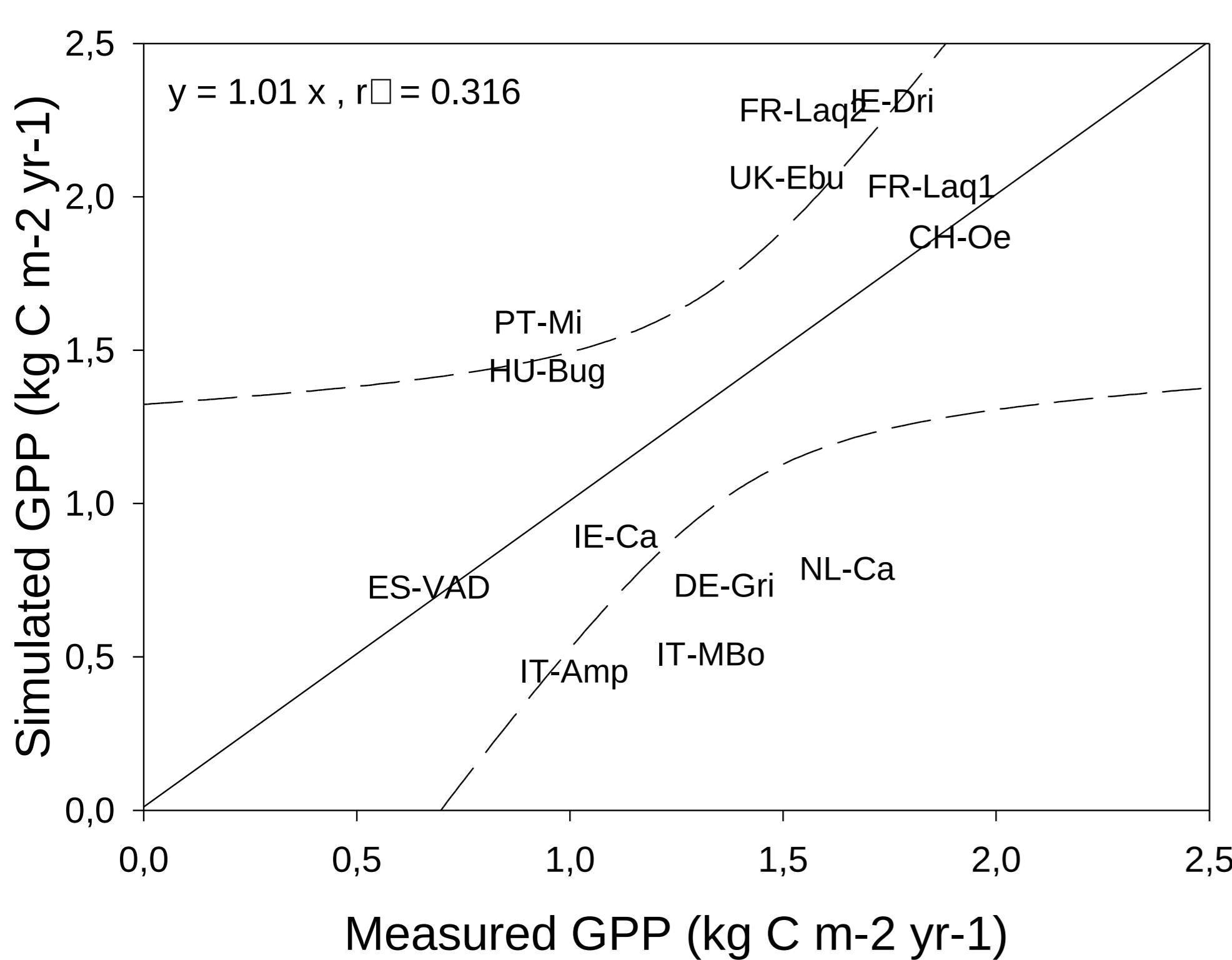
## Model structure



## Data in- and output



## Model validation



Comparison of simulated vs. observed mean annual gross primary productivity (GPP) and ecosystem respiration (Reco) at 13 European grassland sites.

## Main properties

- Process-based biogeochemical model ( $\text{H}_2\text{O}$ , C and N cycles)
- System simulated: soil-vegetation-animal-atmosphere
- Short and long term simulations
- Subdaily (hourly) time scale for detailed dynamics and energy budgets stability
- **Plot scale** (upscaling ability)

## Accessibility

- Used for **process understanding** rather than decision support
- Graphical user interface
- Software and documentation available for research at <https://www1.clermont.inra.fr/urep/modeles/pasim.htm>

## Evaluation/Validation

- **Variables:**
  - Forage yield and quality
  - Greenhouse gas and energy fluxes
  - Soil temperature and water content
  - Animal performance
- **Conditions:** European climate

## Usefulness and originality

- Prediction of:
- mechanistically cattle performance
  - biogeochemical cycles of grasslands and their interactions
  - climate changes impacts on livestock systems, and possible adaption options

## Project involvement

- National Projects  
CLIMATOR, VALIDATE, ORACLE, EPAD
- European projects  
GREENGRASS (2003-2005)  
CARBOEUROPE (2005-2008)  
NITROEUROPE (2007-2011)  
CARBO-EXTREME, GHG-EUROPE, ANIMAL CHANGE

## Perspectives

- to improve:
- legume dynamics
  - functional plant traits
  - responses to climate change and management
  - grasslands responses to climate and management under **tropical conditions**

## PaSim references

- Riedo et al. 1998, 2002 Ecol. Model.  
Schmid et al. 2001 Nutr. Cycl. Agroecosys.  
Vuichard et al. 2007a,b Global Biogeochem. Cy.  
Graux et al. 2011 (submitted to Agricultural Forest and Meteorology)  
Graux et al. 2011 (Agr. Ecosyst. Environ., in press)  
Lardy et al. 2011 (Environmental Modelling and Software, in press)

For further information:  
[pasim@clermont.inra.fr](mailto:pasim@clermont.inra.fr)

