

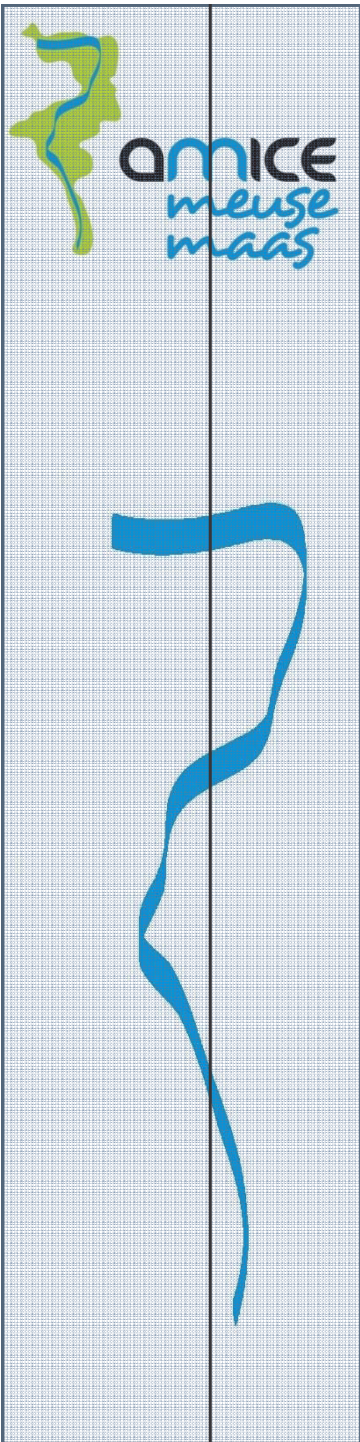
# Adaptation of the Meuse to the Impacts of Climate Evolutions



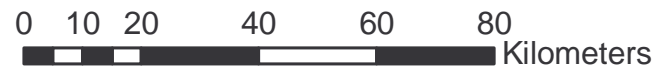
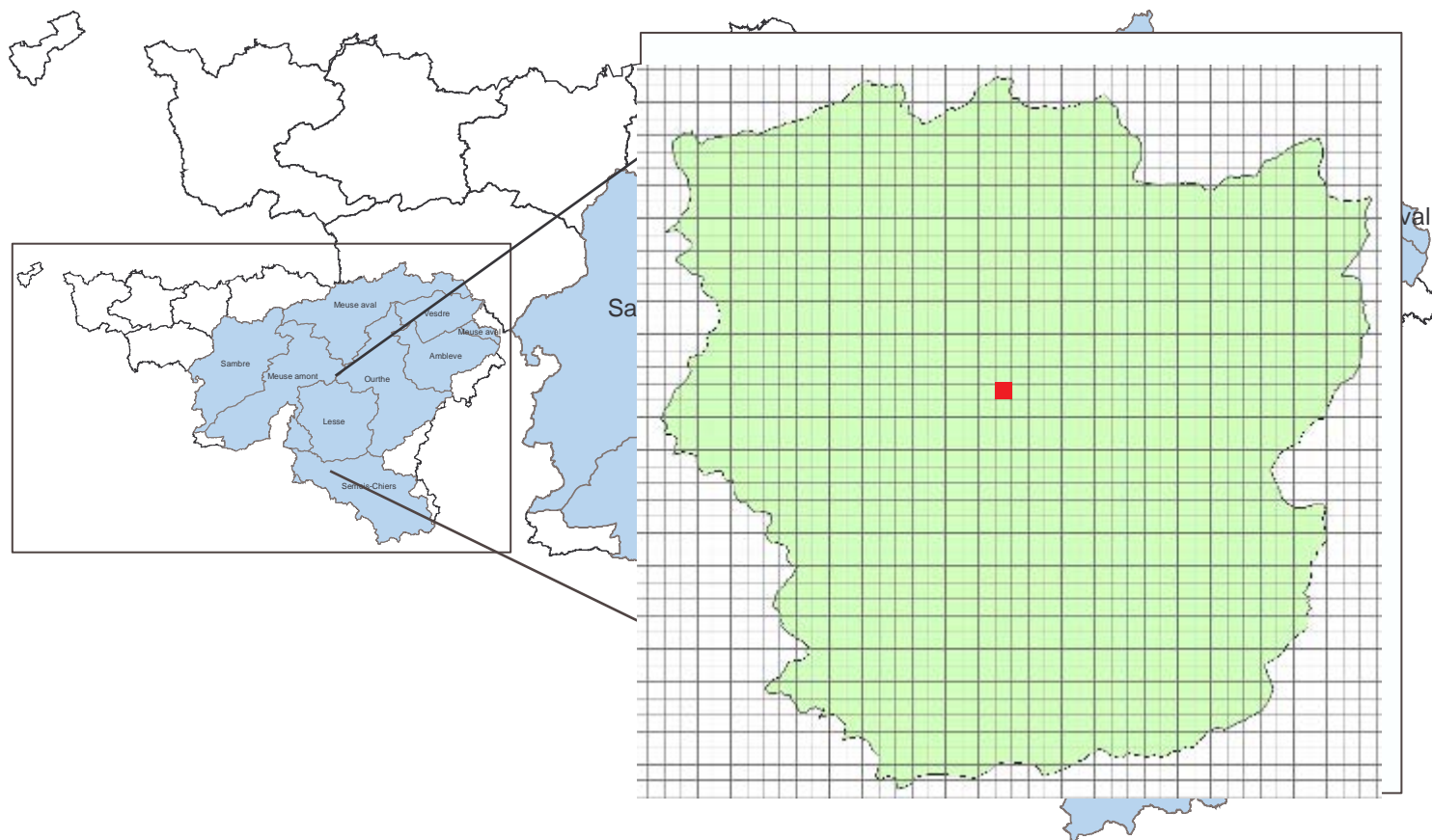
## Presentation of the hydrologic model EPICgrid

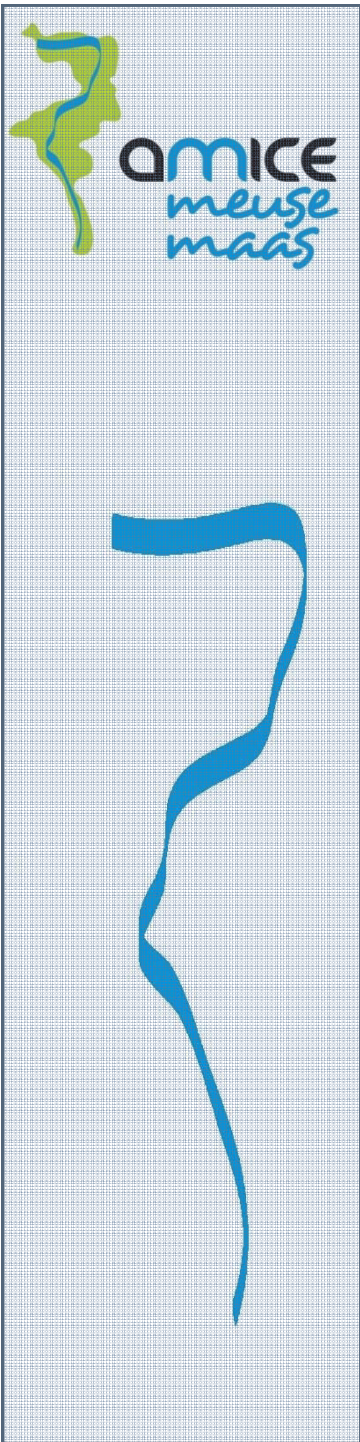
Ir. C. Sohier, Ir. A. Bauwens, Dr. A. Degré





# Presentation of EPICgrid model





# Presentation of EPICgrid model

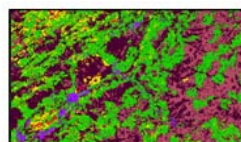
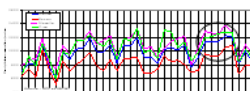
- Distributed, physically based model

**EPICGRID**  
Catchment  
Modelisation  
Soils and vadose zone

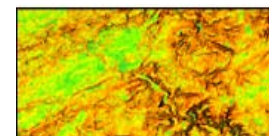
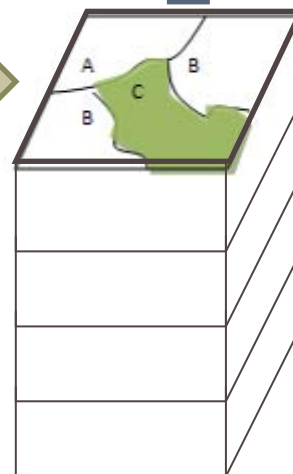


Grid square : 1 sq. km.

Climate data



Landuse, Crop  
growth,  
agricultural  
practices



DEM



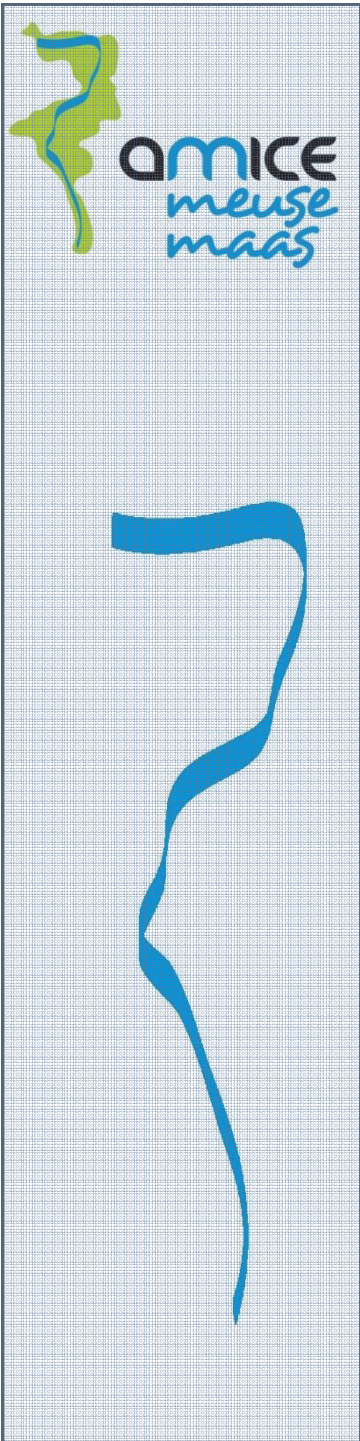
Soils



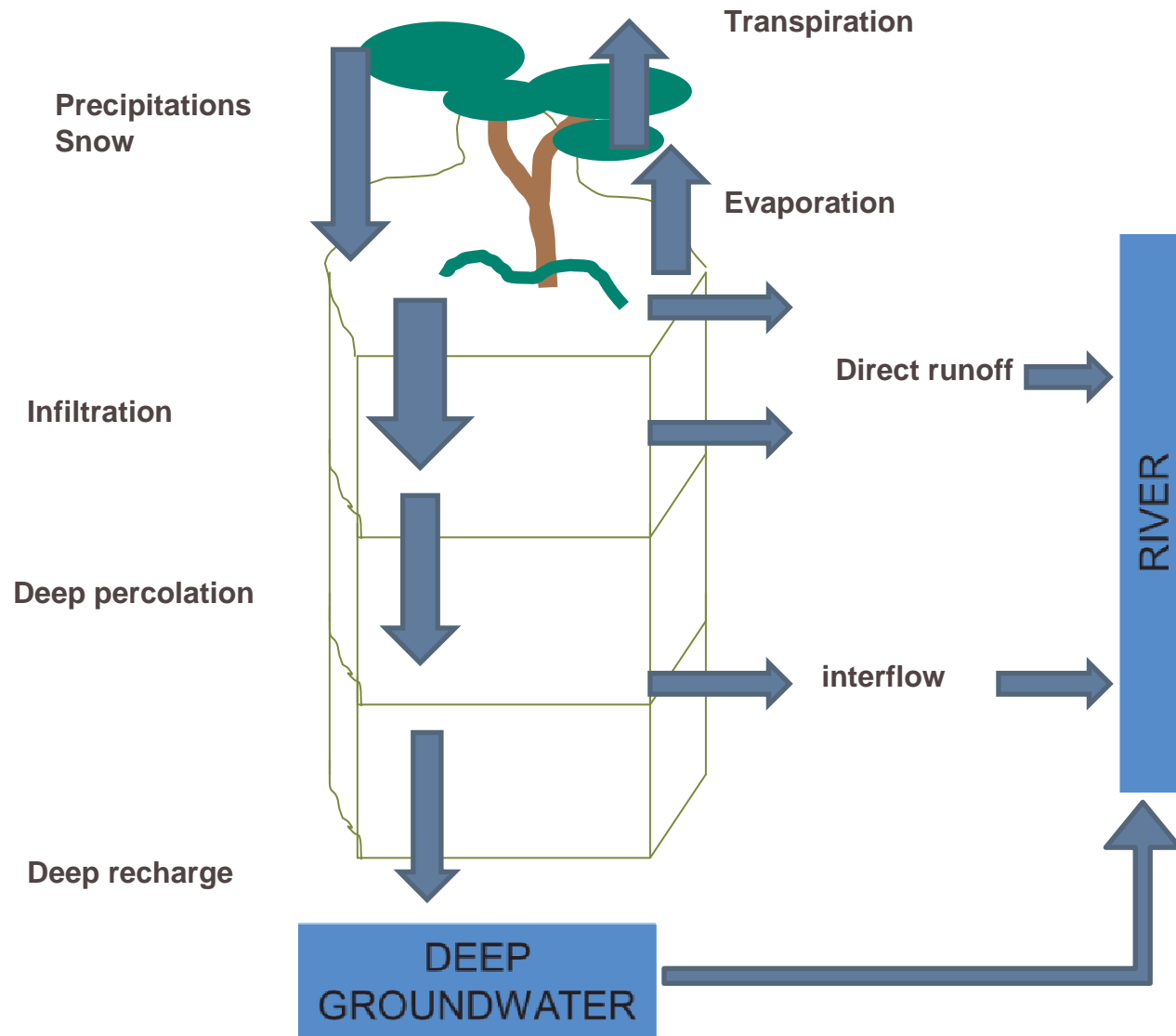
Geology

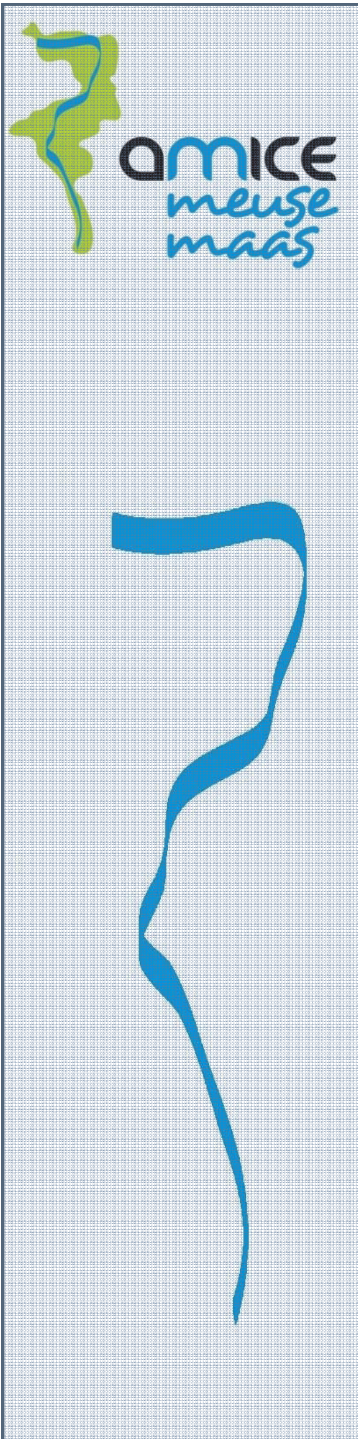


In each grid square ponderation  
of the different components



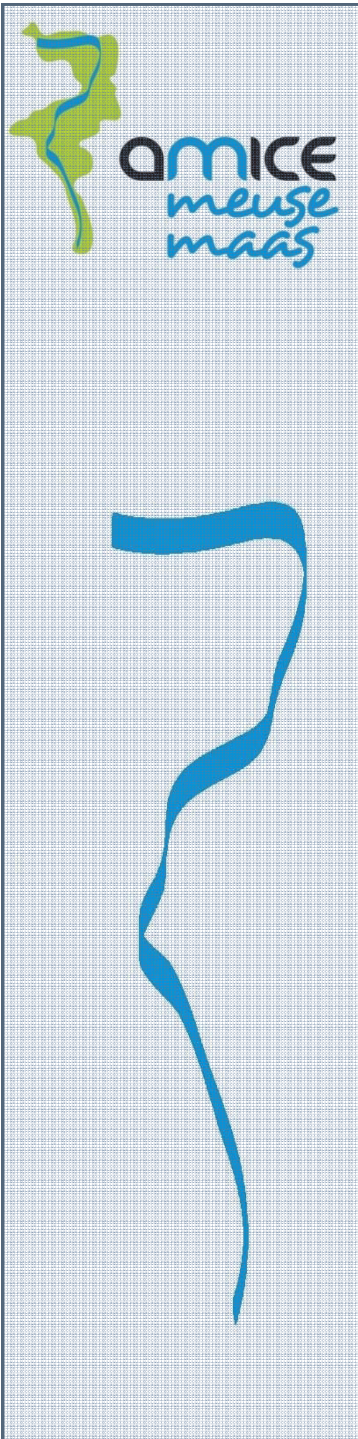
# Presentation of EPICgrid model





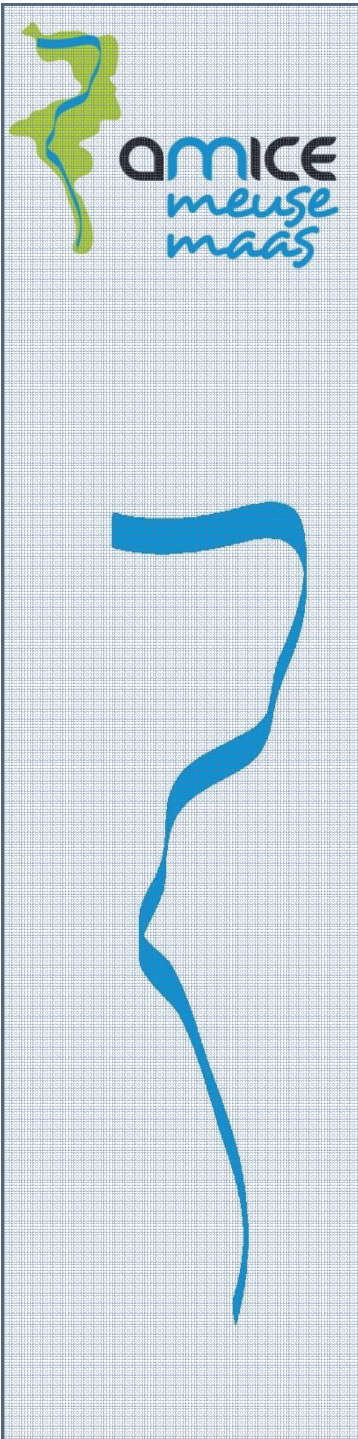
# Inputs

- Meteorological data (rainfall,  $t^{\circ}\text{max}$ ,  $t^{\circ}\text{min}$ , solar radiation, wind speed at 10m, RH) at daily time step
- Cartographic database
  - the soil occupation map (CNOSW)
  - the soil map (CNSW)
  - the digital elevation model (DEM)
  - the map of non saturated soil depths
  - the localisation maps of the meteorological stations and their areas of influence
  - the slope map
  - the map of hydrological group of soils (S.C.S. method)
  - The map of runoff parameters CN (S.C.S. method)



# Inputs

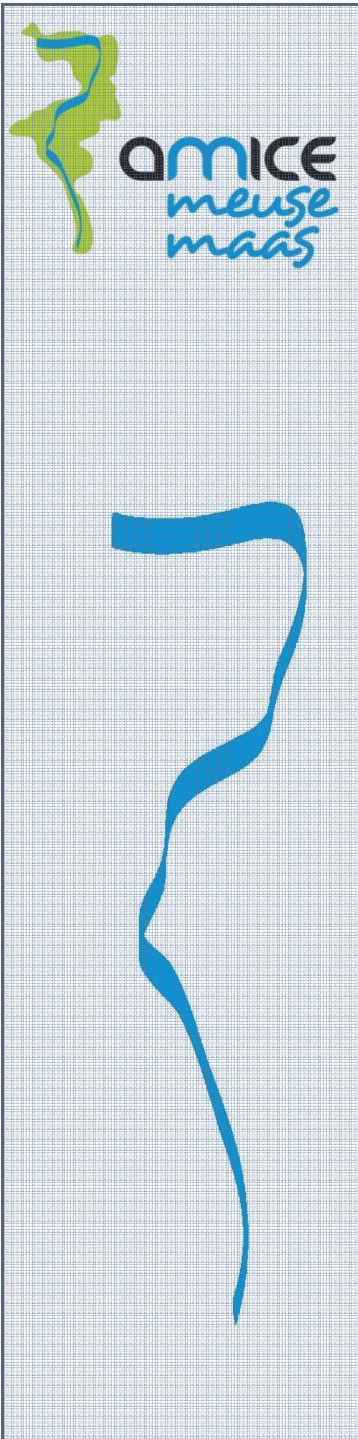
- Associated parameters of the soil occupation map:  
Cultural calendar of the occupation (date of seedling, harvesting, tillage, fertilizer occupation, ...) associated to each soil occupation class
- Associated parameters of the soil maps:  
weighty clay-silt-sand content, bulk density, soil saturated hydraulic conductivity, wilting point soil water content, field capacity soil water content,....
- Associated parameters of the non saturated soil thickness map:  
A datafile describing the main characteristics of the different layers up to the groundwater table is associated with each geological class.



# Culture

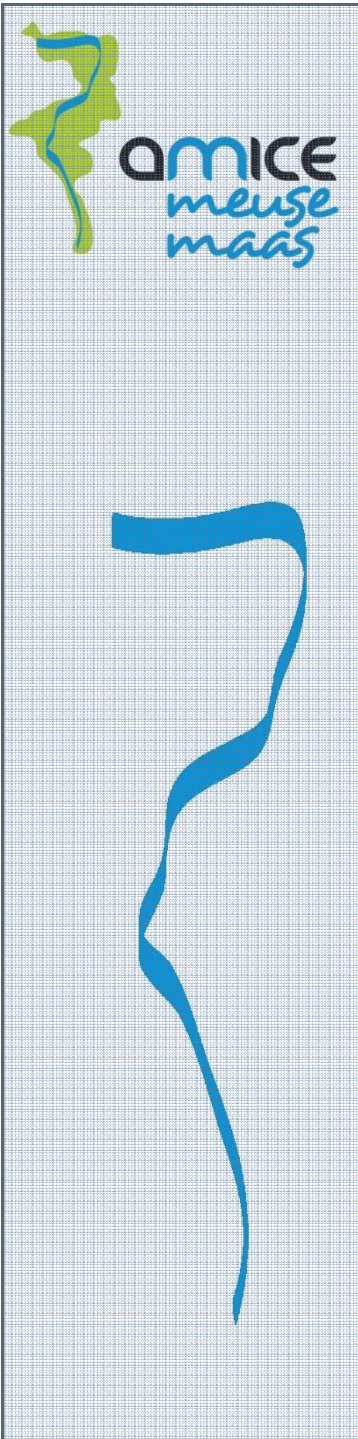
- Crops:
  - Wheat
  - Winter Barley
  - Spelt / German wheat
  - Oats
  - Barley (orge de printemps)
  - Spring wheat (froment de printemps)
- Sugar beet
- Corn
- Potato
- Flax, chicory, fallow

Crops succession on a 3 years basis are considered



# Possible outputs for agriculture

- Climate change effects on :
  - water deficiencies
  - Irrigation needs
  - Crop yields
  - Field accessibility
  - Soil compaction



# Possible outputs for agriculture

Does climate change mean crop yield reduction?

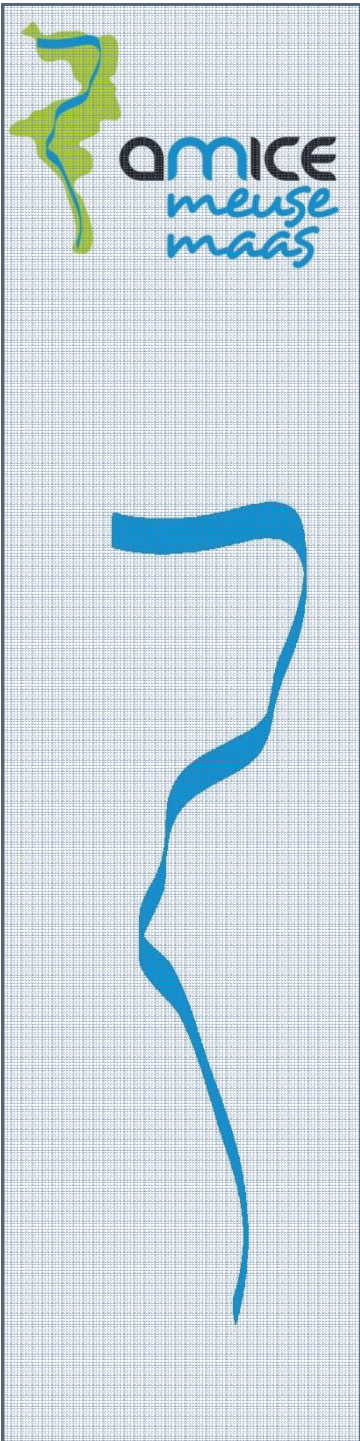
Not necessarily

Even if there is a general decrease of the amount of water, or a change in the distribution of water during the year, yields could increase.

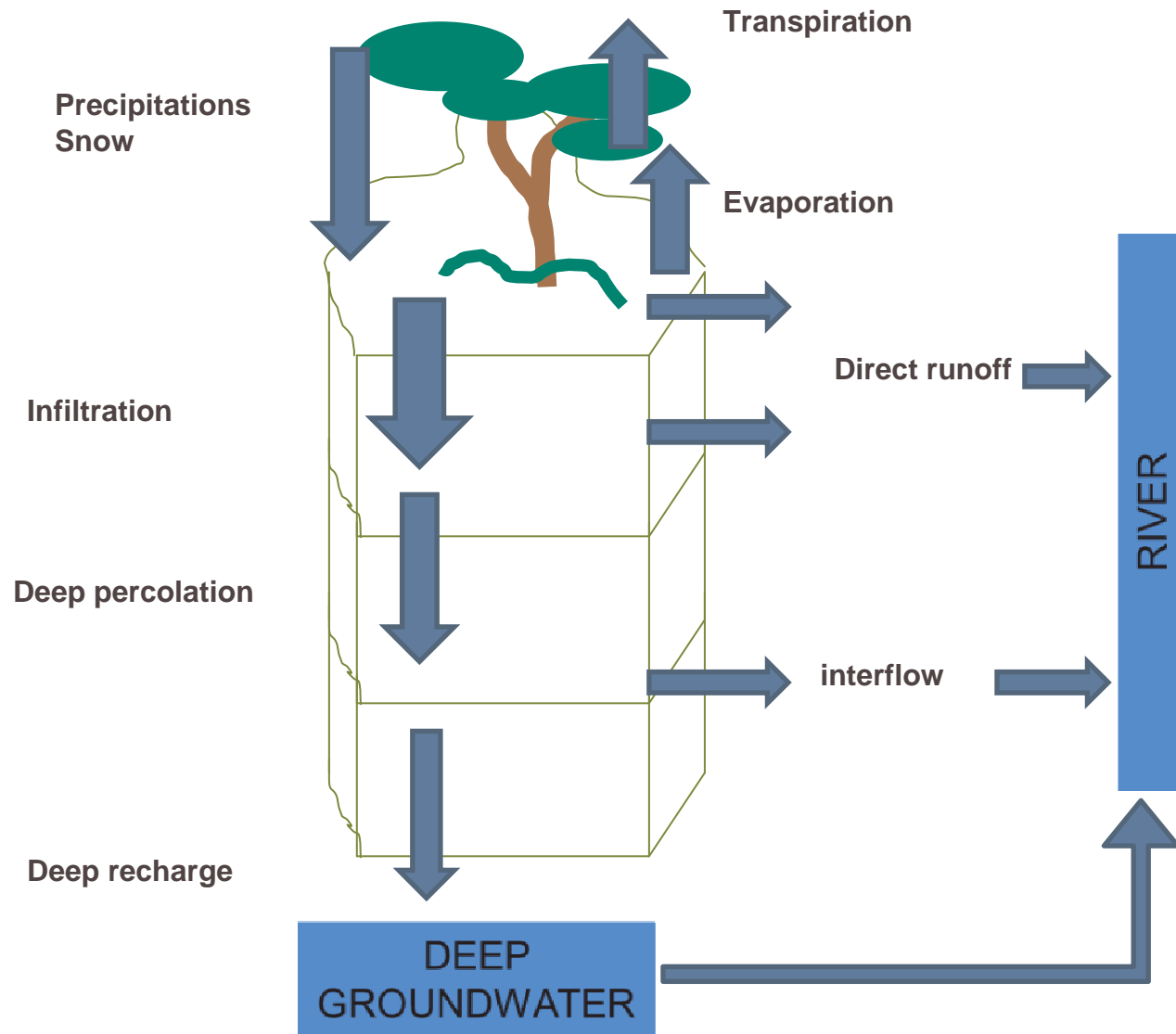
Why?

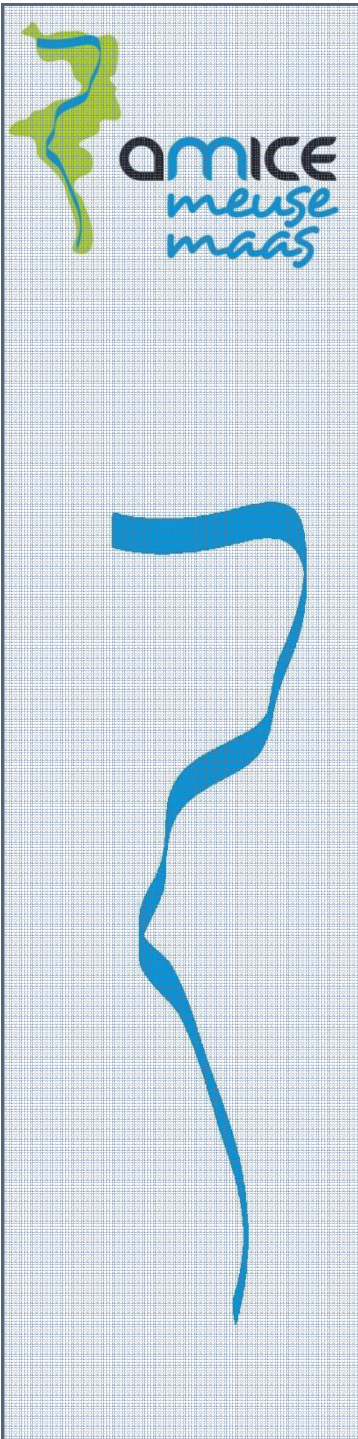
Because yields depends on

- Water availability
- Temperature
- Soil
- Fertilisation



# What could be done in AMICE?



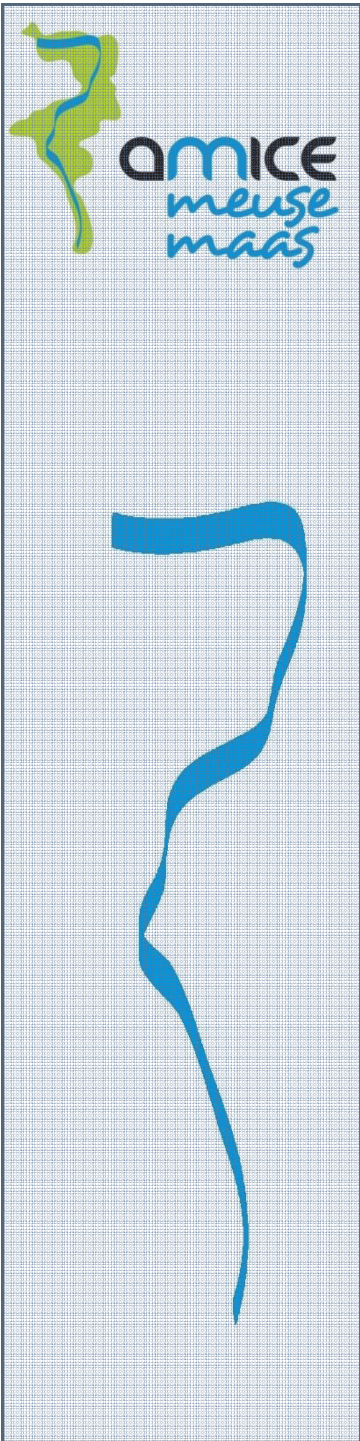


# What could be done in AMICE?

- Field scale modeling
- For several climate change scenarios
- For several crops

Which data are necessary:

- Meteorological data at daily time step
  - Data from AC3
- Crop
  - Which one?
- soil description ( $\Theta_{\text{wilting point}}$ ,  $\Theta_{\text{field capacity}}$ ,  $\Theta_{\text{saturation}}$ )
- Soil thickness
- Slope
  - all the data are known for Wallonia
  - available in F, FI, G, NI??



Thank you for your  
attention