

How to assign a value to soil sustainability?

An example based on water erosion modeling

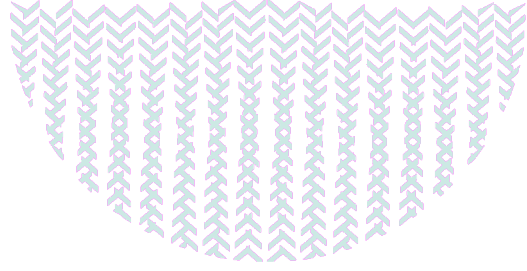
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Introduction



Climate and land use changes

→ Changes in soil erosion rate

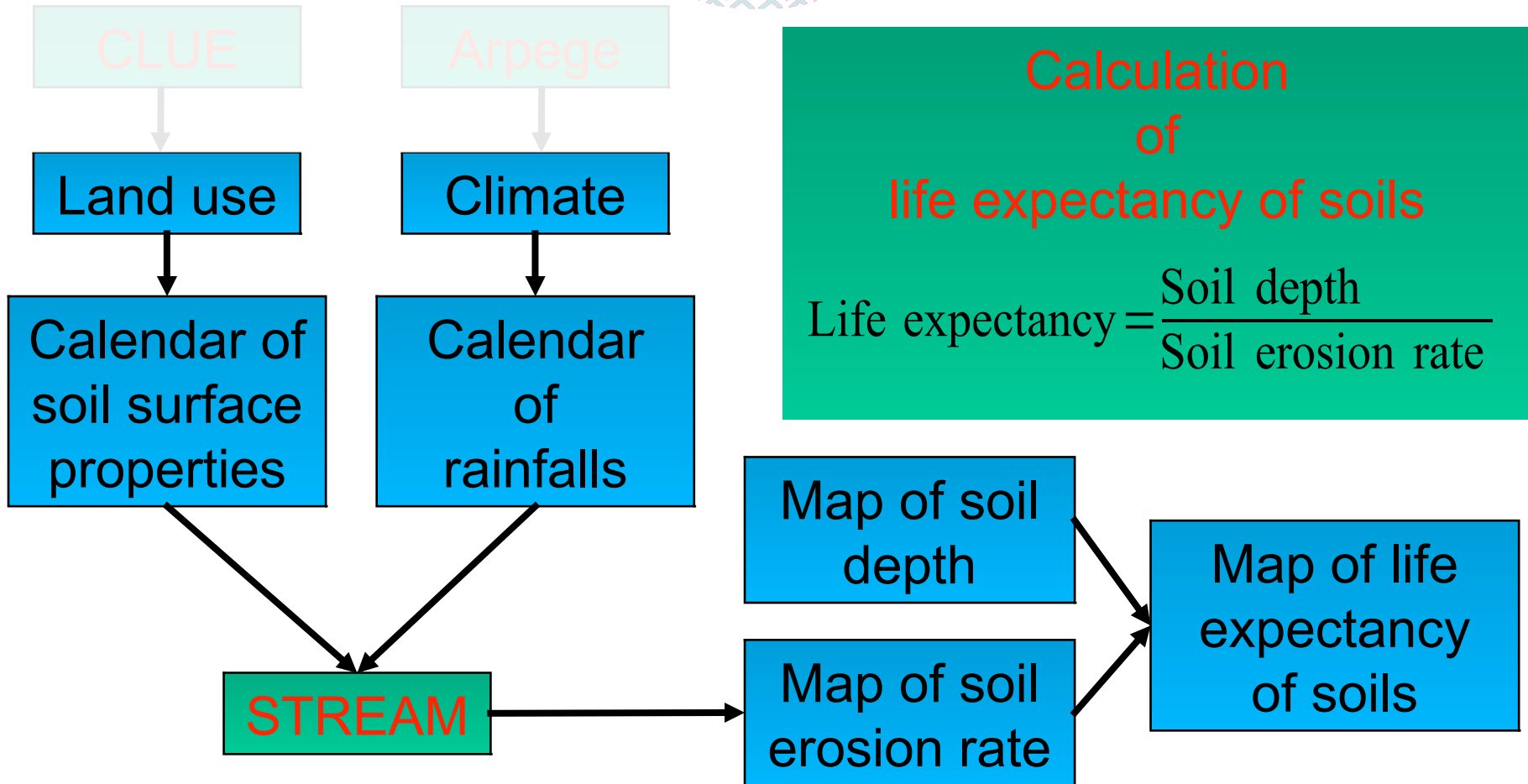
→ Soil sustainability

→ Watershed management

Definition: Change in soil sustainability = Change in soil thickness

From soil erosion rate to life expectancy of soil
(based on Sparovek & Schnug, 2001)

Method

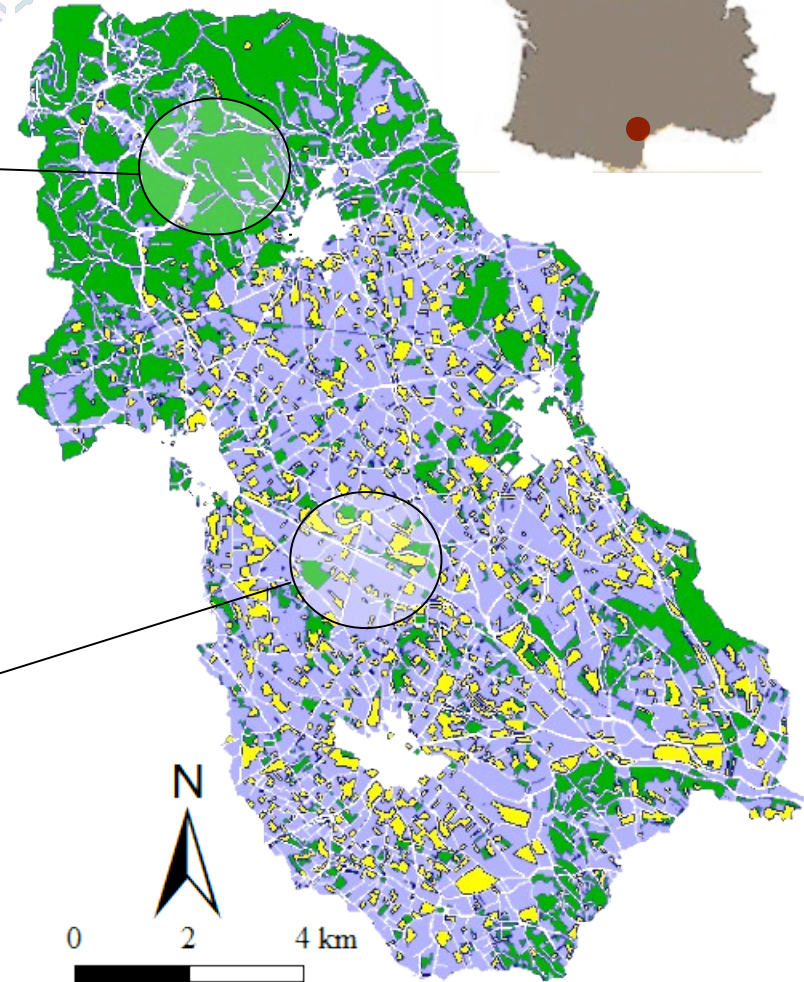


Test watershed

75 km²

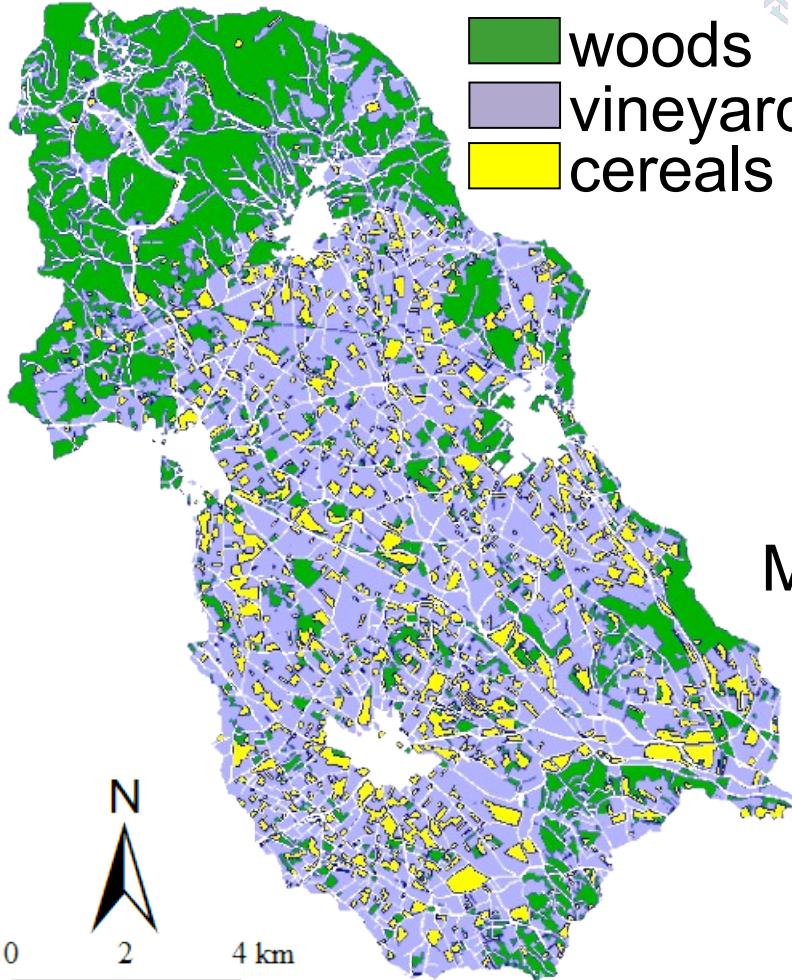


- woods
- vineyards
- cereals

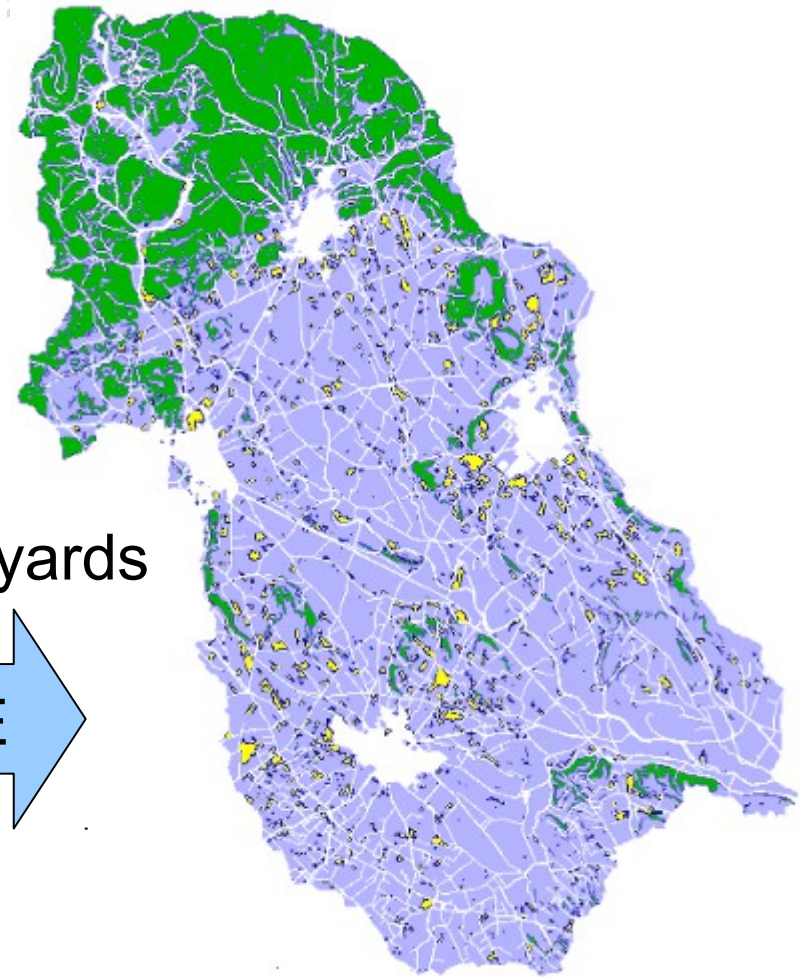
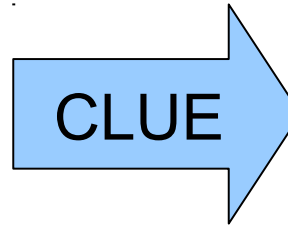


Land use change

- woods
- vineyards
- cereals

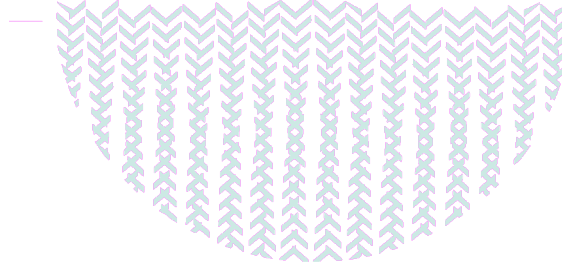


More vineyards



Results

Soil erosion rate



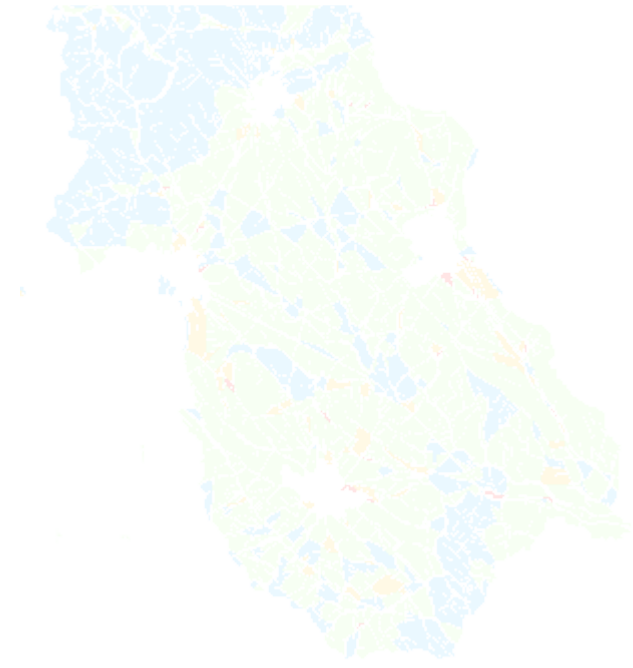
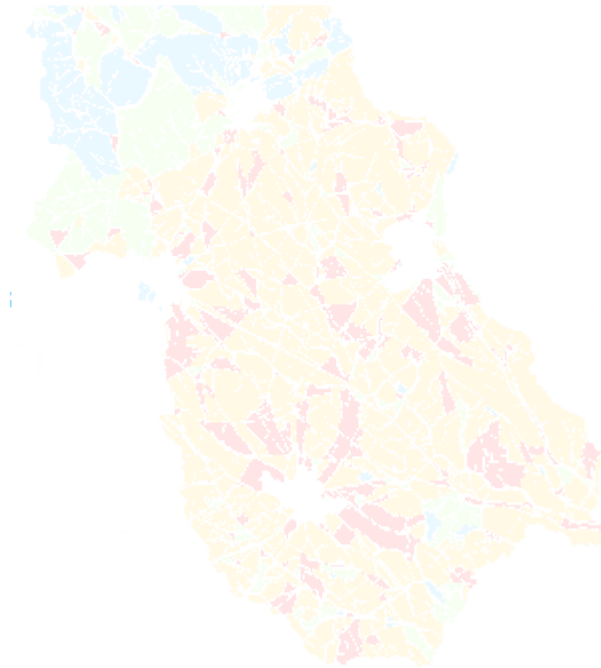
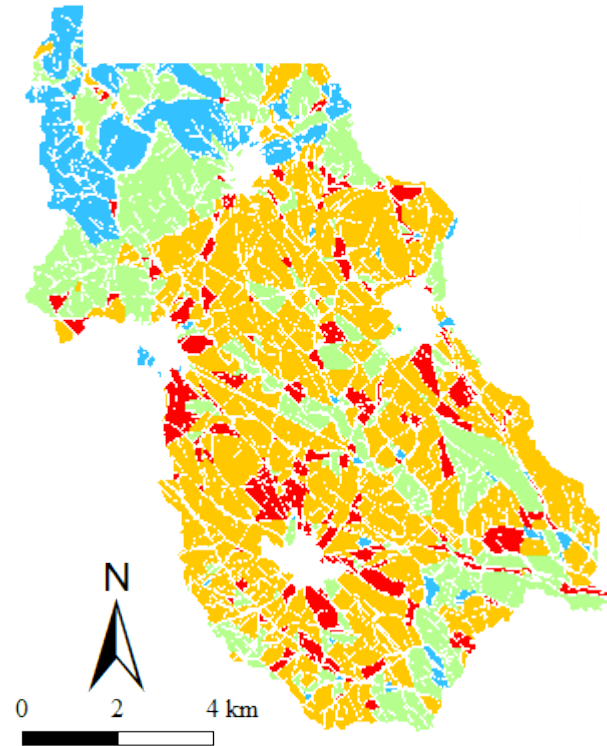
t/ha/a (9th decile)



Current

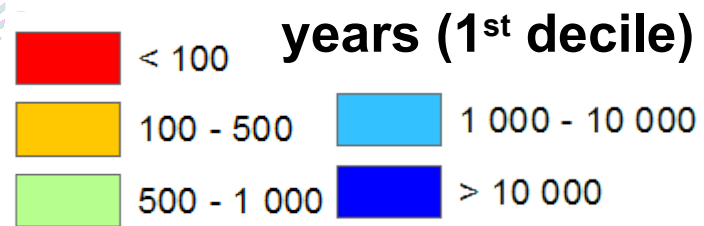
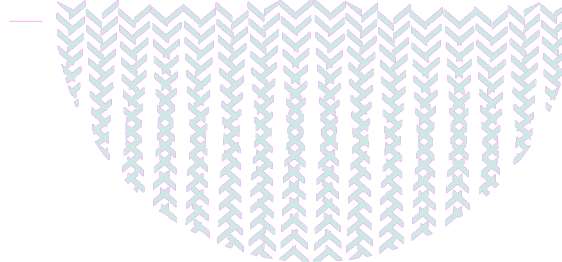
More vineyards

Environmental law



Results

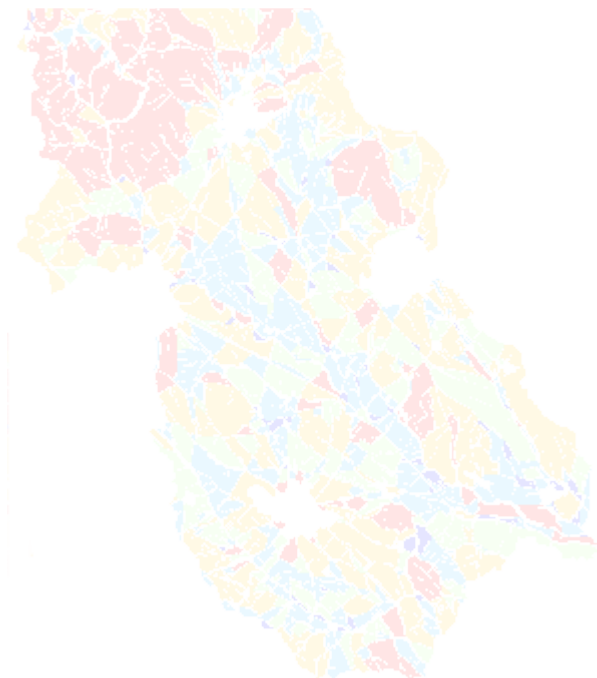
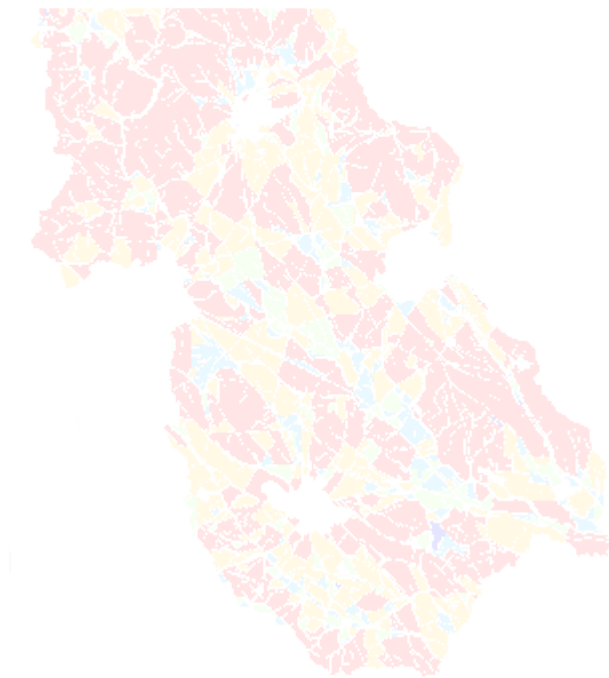
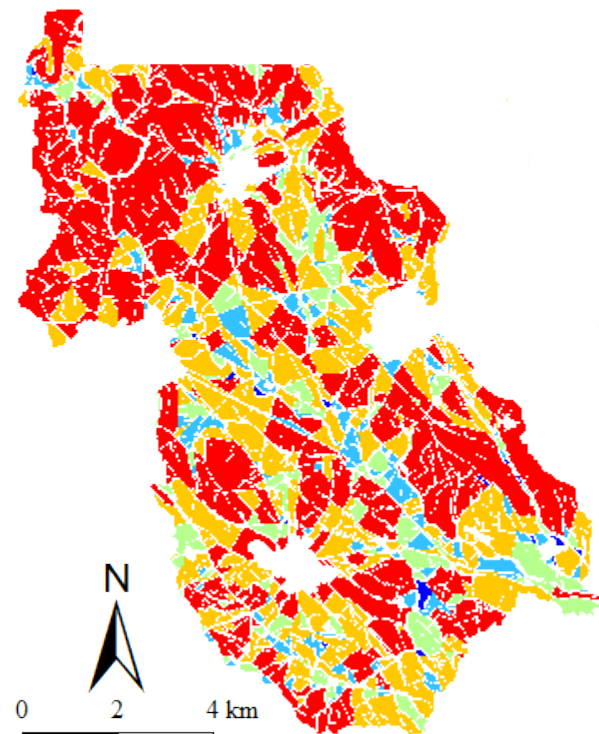
Life expectancy



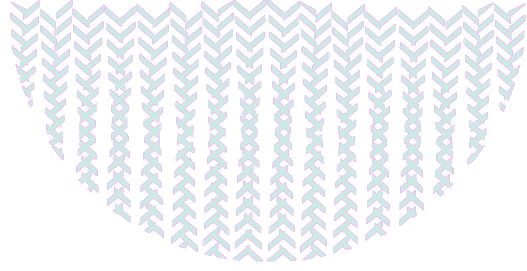
Current

More vineyards

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Conclusion



Life expectancy of soil

- ✓ Definition of a methodology to assess soil sustainability to water erosion.
- ✓ Help in support decision-makers for long-term watershed management.

Future developments

- Water storage
- Carbon storage