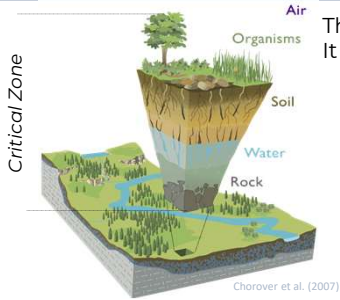


Maud Henrion¹, Yanfei Li¹, Adil Tham¹, Eléonore du Bois d'Aische^{1,2}, François Jonard^{1,2}, Sébastien Lambot¹, Sophie Opfergelt¹, Veerle Vanacker¹, Kristof Van Oost¹

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Context



The **Critical Zone** provides many ecosystem services
It governs :

- infiltration and runoff
- evaporation
- energy exchange between soil and atmosphere
- solute transport
- plant growth
- carbon storage
- etc.

Climate change
Human activities

Critical Zone perturbations

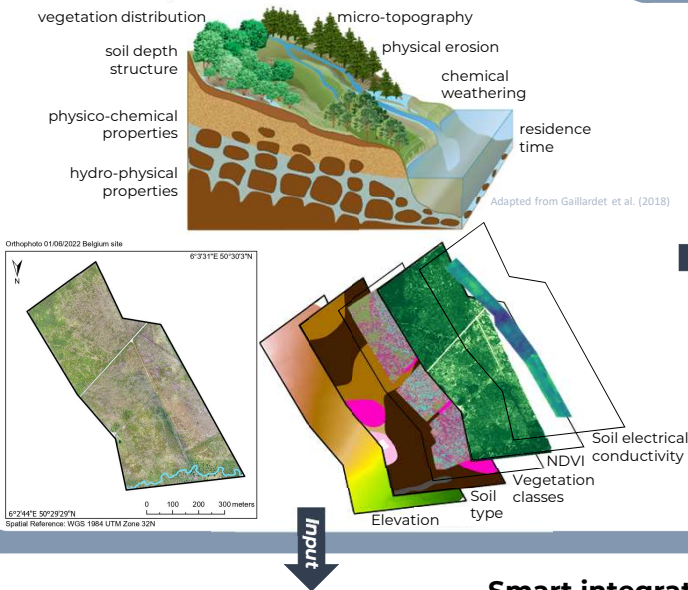
Hydrological controls?

geomorphological
Processes

biogeochemical hydrodynamic

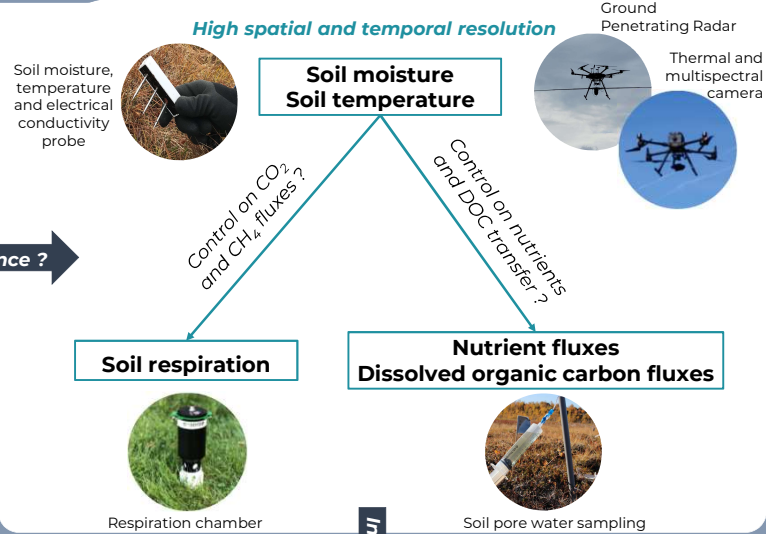
Need for a **multidisciplinary** and **integrative** approach ⇒

Long-term patterns in the Critical Zone

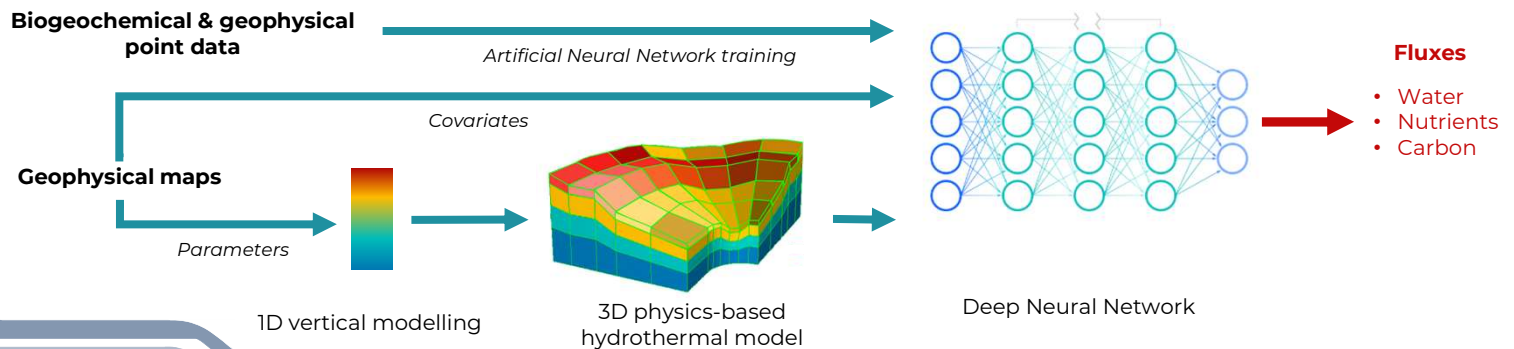


Methodology

(Sub)surface monitoring of the Critical Zone



Smart integration in the Critical Zone



Case Studies

Eight Mile Lake - Alaska (USA)

Frozen peatland with a permafrost degradation gradient

1.

High Fens - Belgium

Peatland with a topographic and hydrological gradient

Adapted from WeThaw (2020)

1. What is the fate of organic carbon trapped in a significant but vulnerable C-storage such as an Arctic peatland with global warming?
2. How will hydrological changes influence carbon and nutrient fluxes?