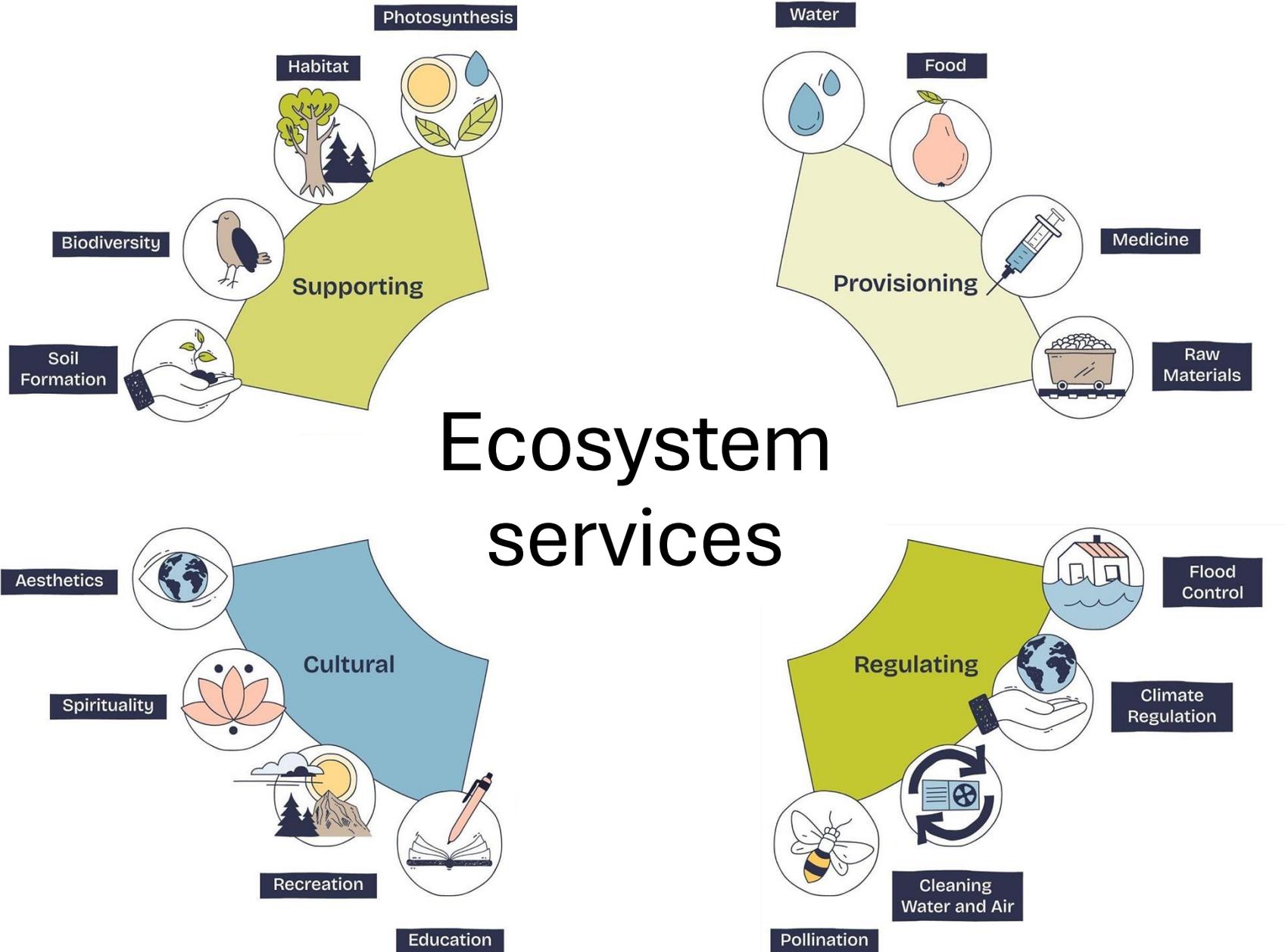


# *Soil ecosystem services and microbe-mediate greenhouse gas fluxes*

Prof. Ianina Altshuler  
EPFL, 2026







Supporting: habitat,  
nutrient cycling,  
primary production

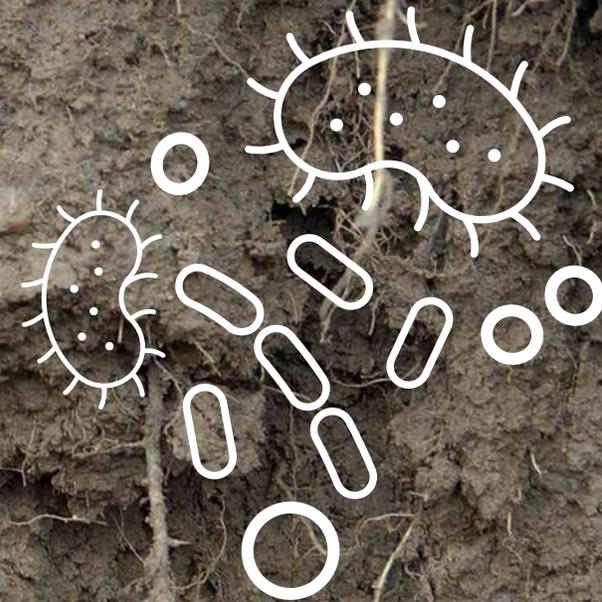
Provisioning: timber,  
game meat,  
medicinal plants,  
mushrooms

Cultural: spiritual,  
recreation,  
eco-tourism,

Regulating:  
moderating climate,  
water quality,  
flood control

# Soils play a central role in many of these services across different ecosystems

- substrate for plants and agriculture
  - habitat for animals
  - nutrient cycling
- contaminant reduction
  - water filtration
- greenhouse gas regulation
- foundation for human structures
- provision of construction material
  - bioprospecting

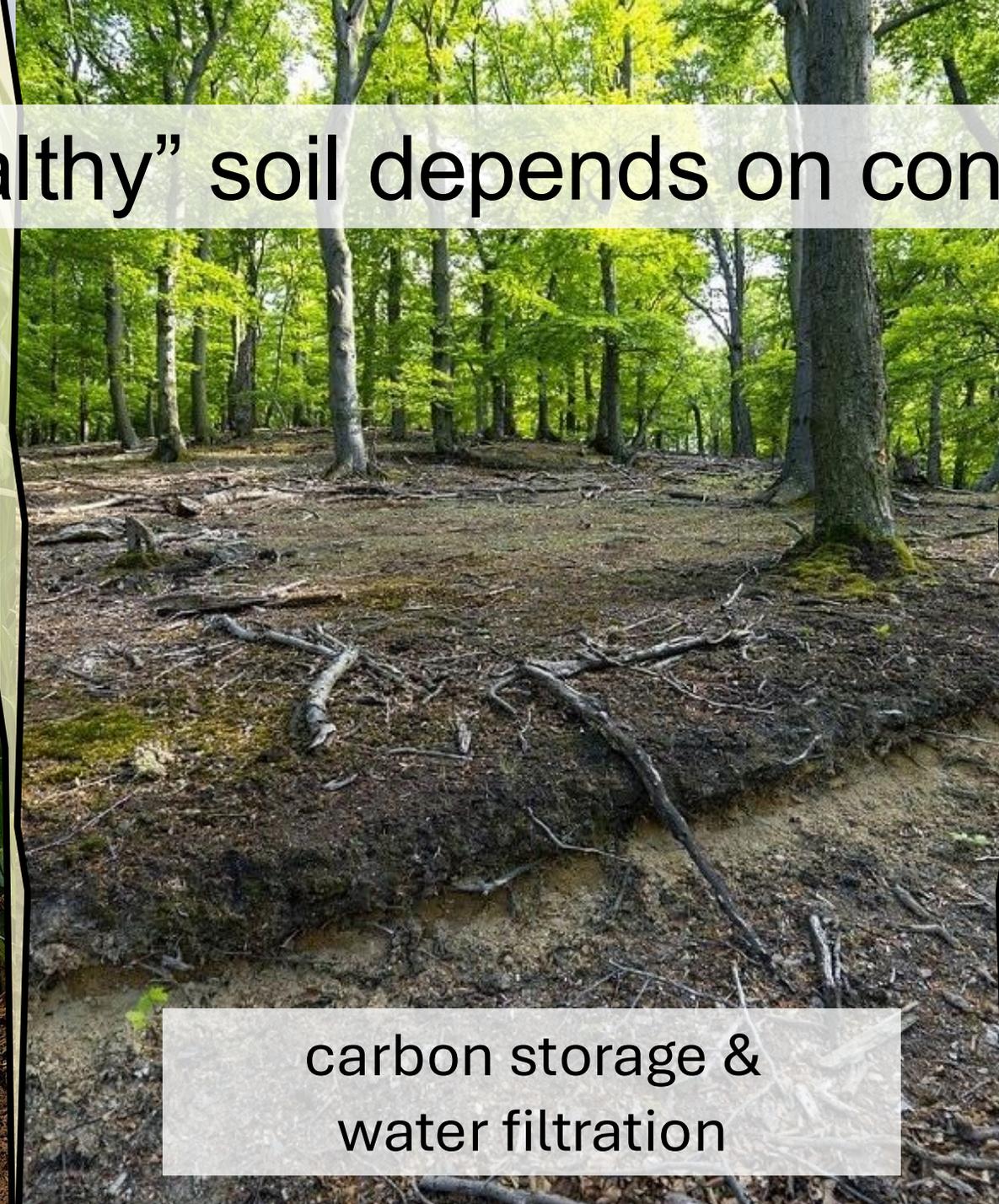




# “Healthy” soil depends on context



productive but  
with heavy metal  
contaminants



carbon storage &  
water filtration



microbial  
biotechnological  
applications

**Built Environments**



**Climate**



**Agriculture**



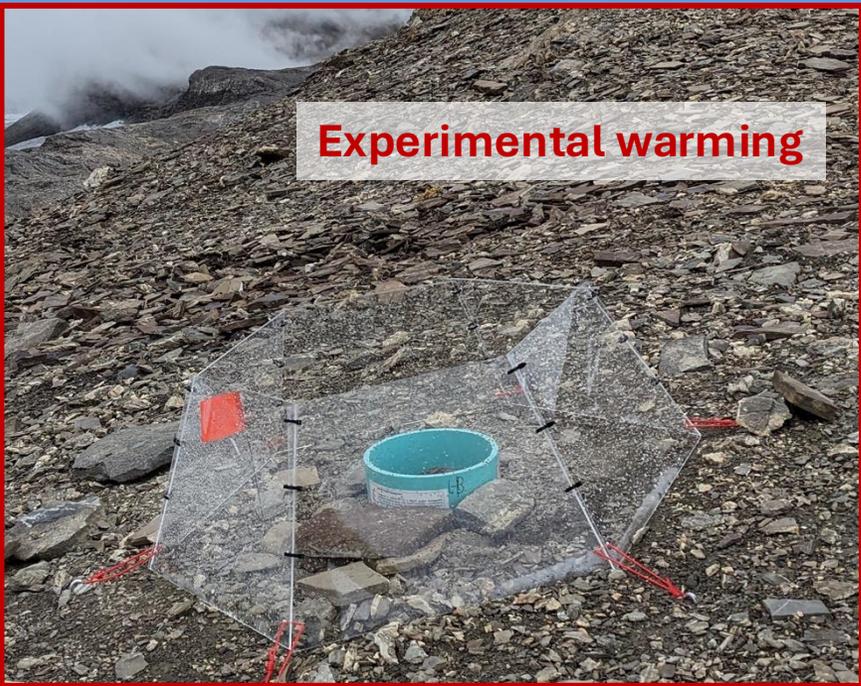
**Ecology**



Across these perspectives, microorganisms contribute to regulation of how soils functions



**Experimental warming**





Normal

Normal

Warm

Warm

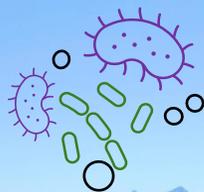
Warm

Normal

Pointe de la Plaine Morte (2900 meters)



$\text{CH}_4$

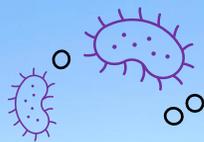
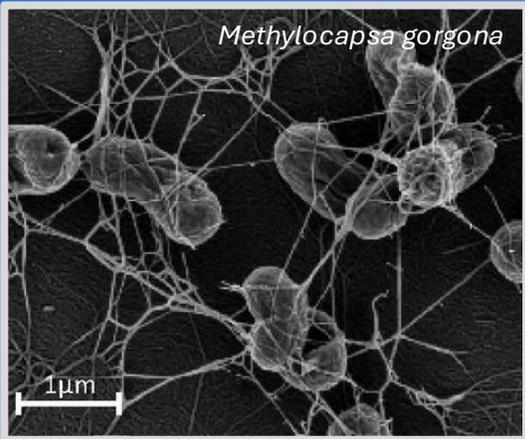


islands of biodiversity



$\text{CO}_2$





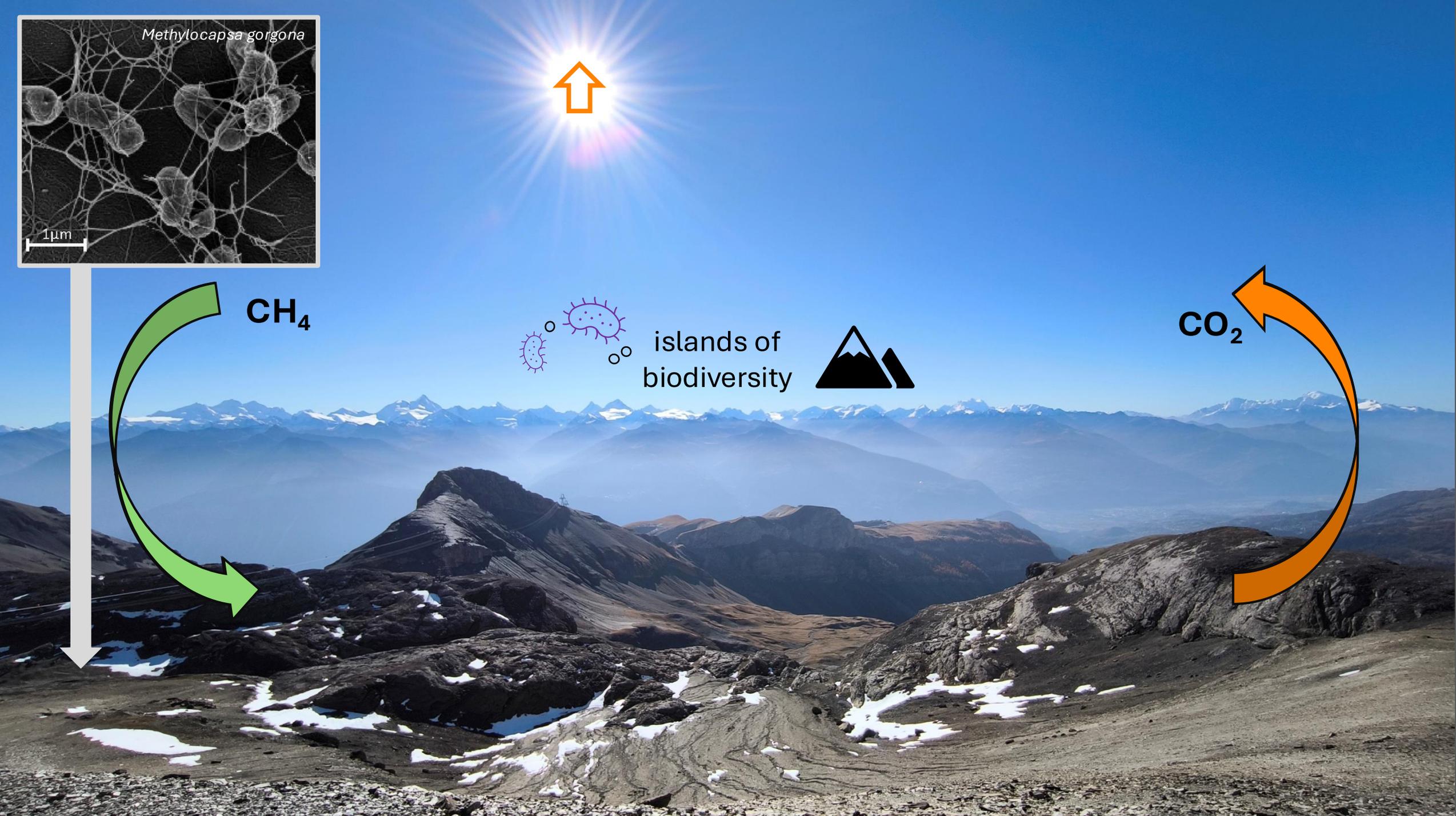
islands of biodiversity



CO<sub>2</sub>



CH<sub>4</sub>



Thank you

