

# LIFE ON THE EDGE

## Mapping cliff microclimates to understand their biodiversity across scales

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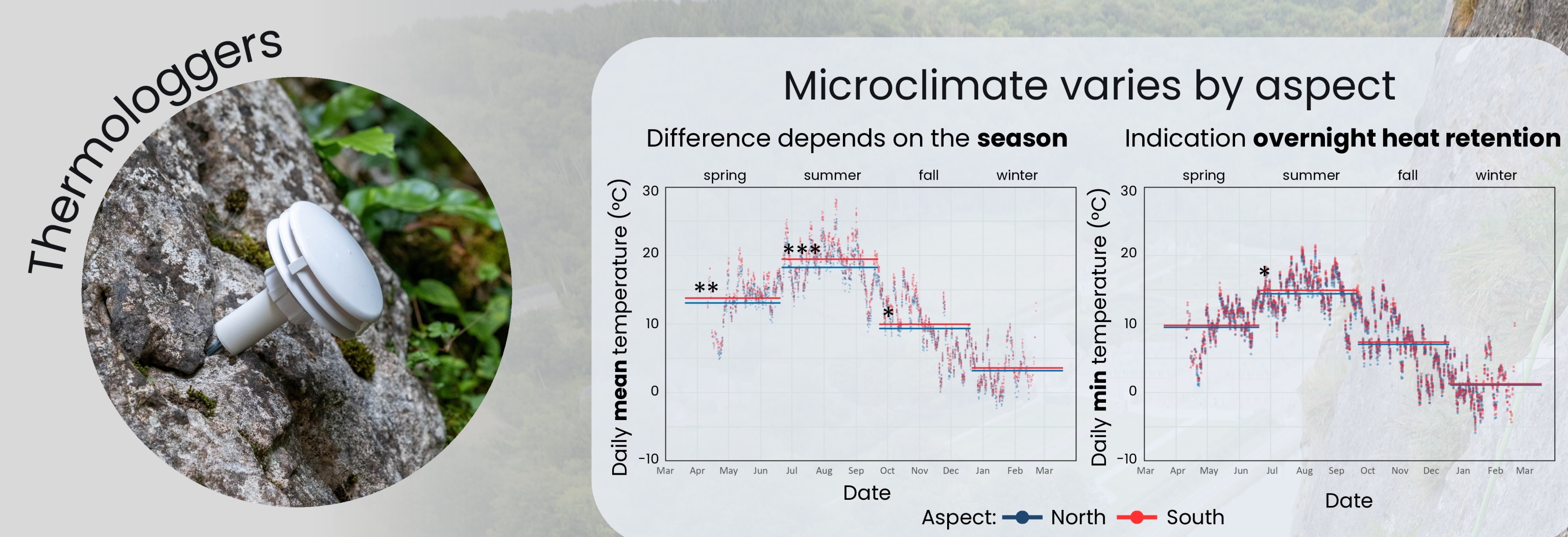
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### MICROCLIMATE AND DISTURBANCE SHAPE CLIFF BIODIVERSITY

Cliff ecosystems host unique and **rich biodiversity** that is shaped by their complex structure. This creates steep microclimatic gradients. However, these gradients remain poorly mapped, and their interaction with **rock climbing** disturbance is still understudied. Here, we map detailed cliff microclimates **across scales** to identify **microrefugia** and **stepping stones** for **species at the edges of their distribution ranges**. This helps explain biodiversity patterns and improves our understanding of responses to global change and disturbance in **cliff ecosystems**.

### MEASURING VERTICAL MICROCLIMATE

Local evidence: **First in situ sensor network on cliff faces**

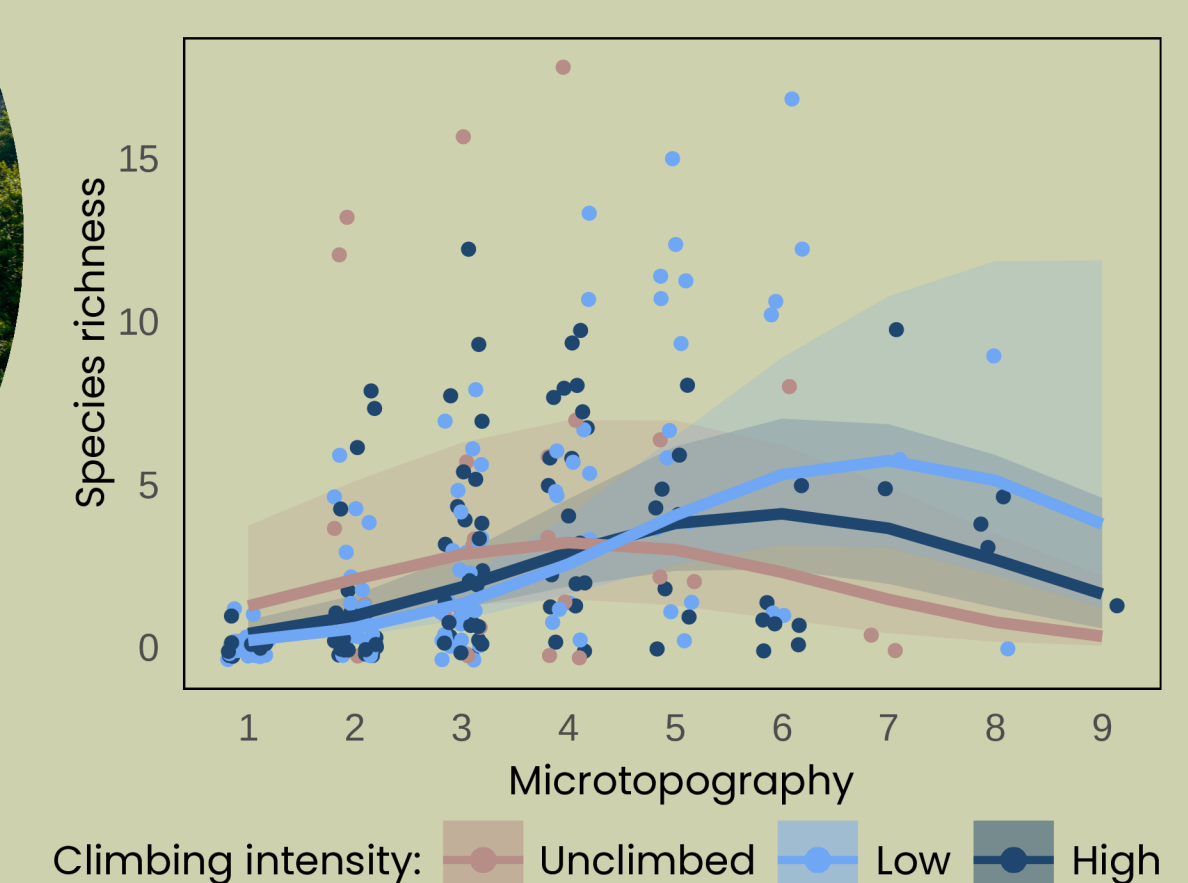


### ROCK CLIMBING

Impacts in Freyr are complex

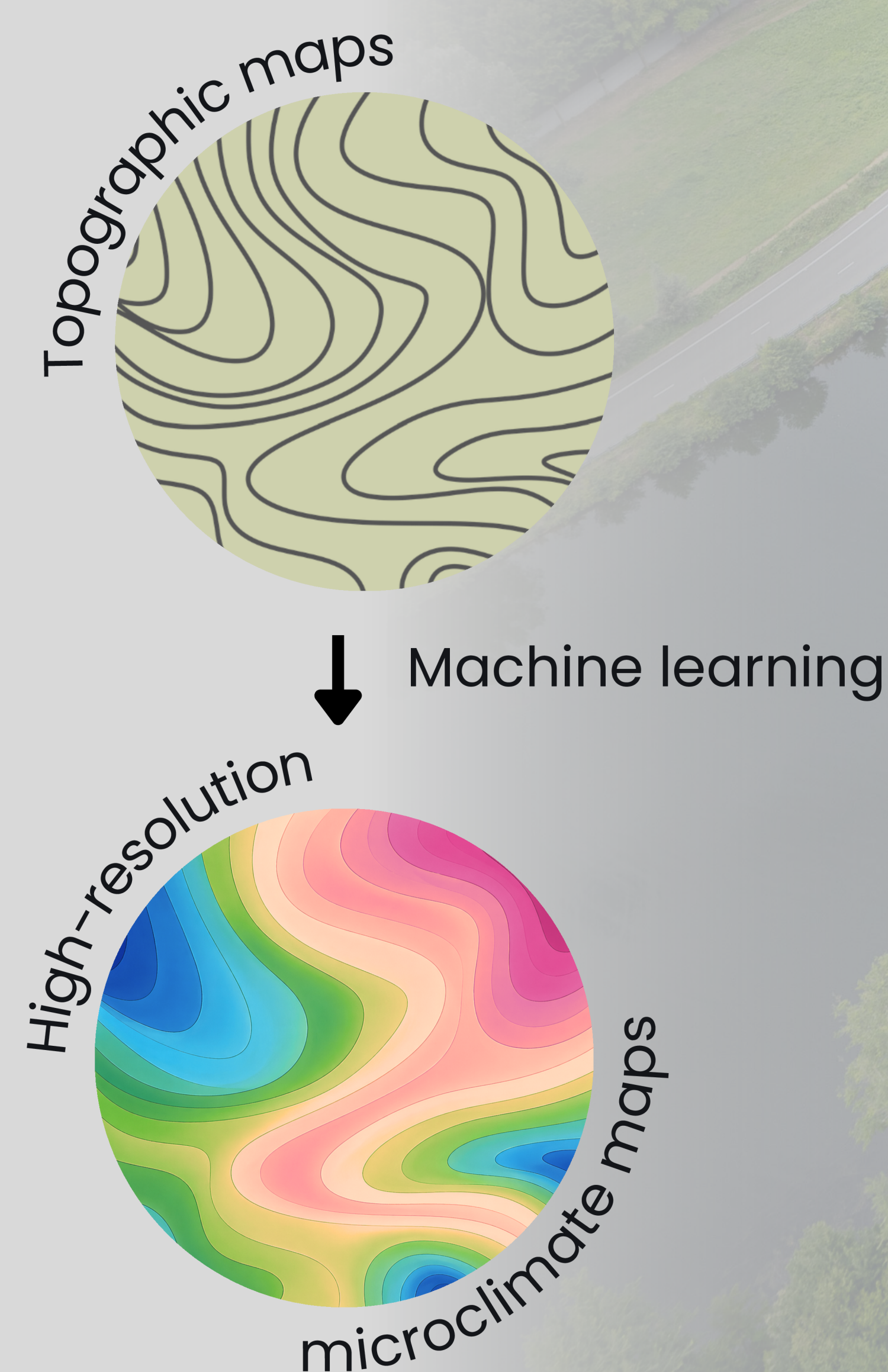
Species richness peaks at **intermediate disturbance**

**Case study:**  
Freyr, Belgium

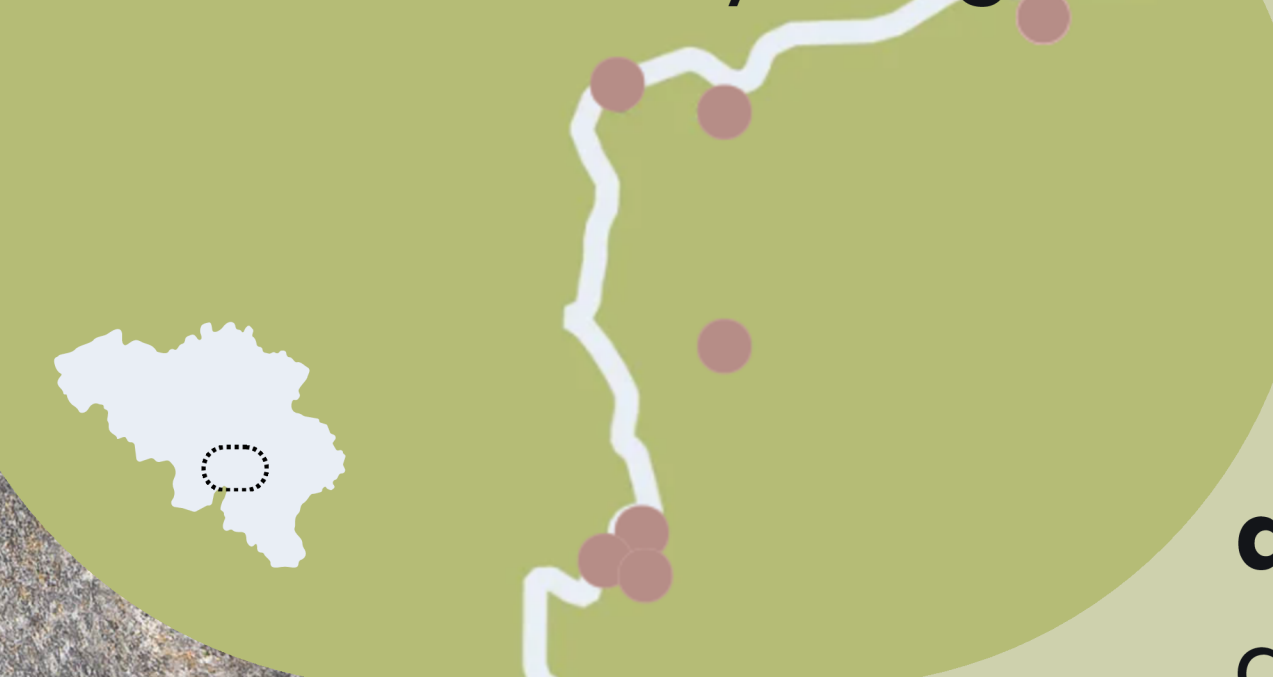


Ongoing research: **Spatiotemporal modelling**

+ More needed for detailed insights



**Multisite study:**  
Meuse Valley, Belgium



Shifts in **species** and  
**functional composition**:

Competitors ↓  
Stress-tolerant species ↓  
Ruderals ↑

**Context-dependent disturbance**, mediated by abiotic cliff characteristics

Microclimate x Disturbance?

Ongoing global analysis

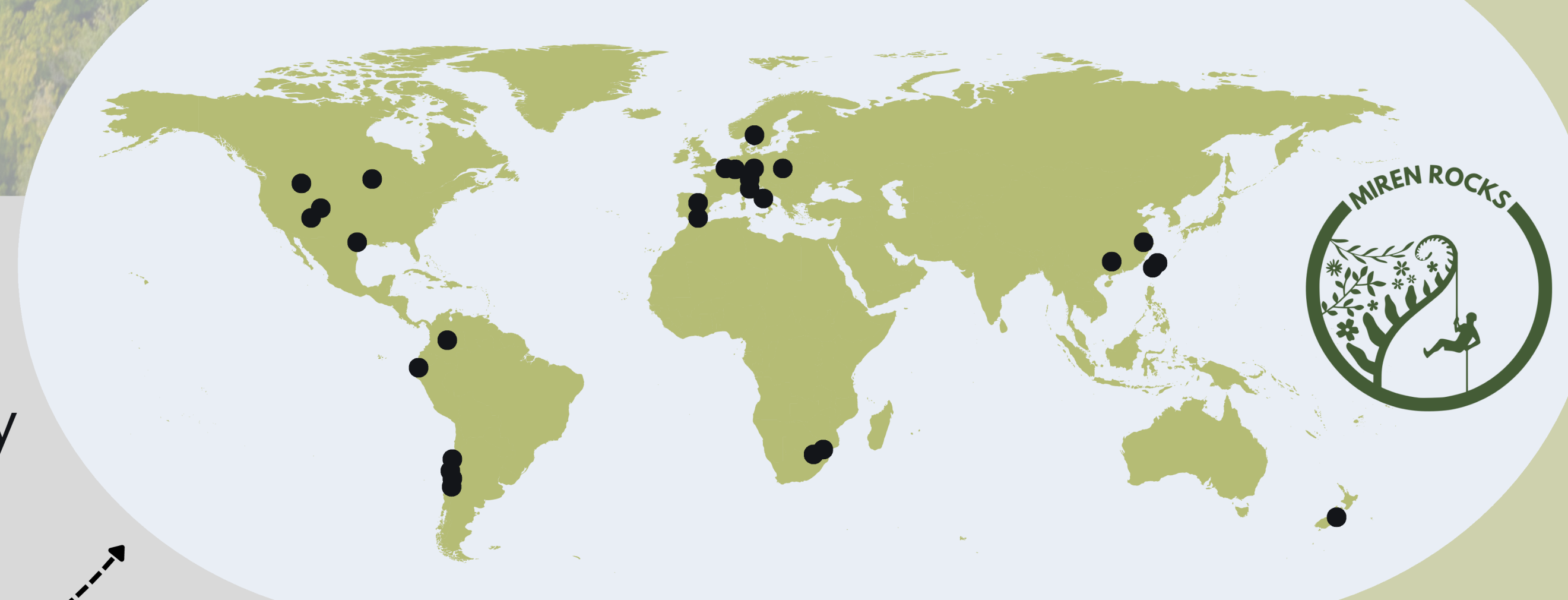
- Identify microrefugia & stepping stones
- Link to community-level temperature affinity

Aim: **Identify predictors**

- Aspect
- Microtopography
- Slope
- Height

For global implementation

**Research network: MIREN\* Rocks**



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