Global Mountain Biodiversity Assessment

Supporting Long-Term Research in Mountain ecosystems

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BACKGROUND

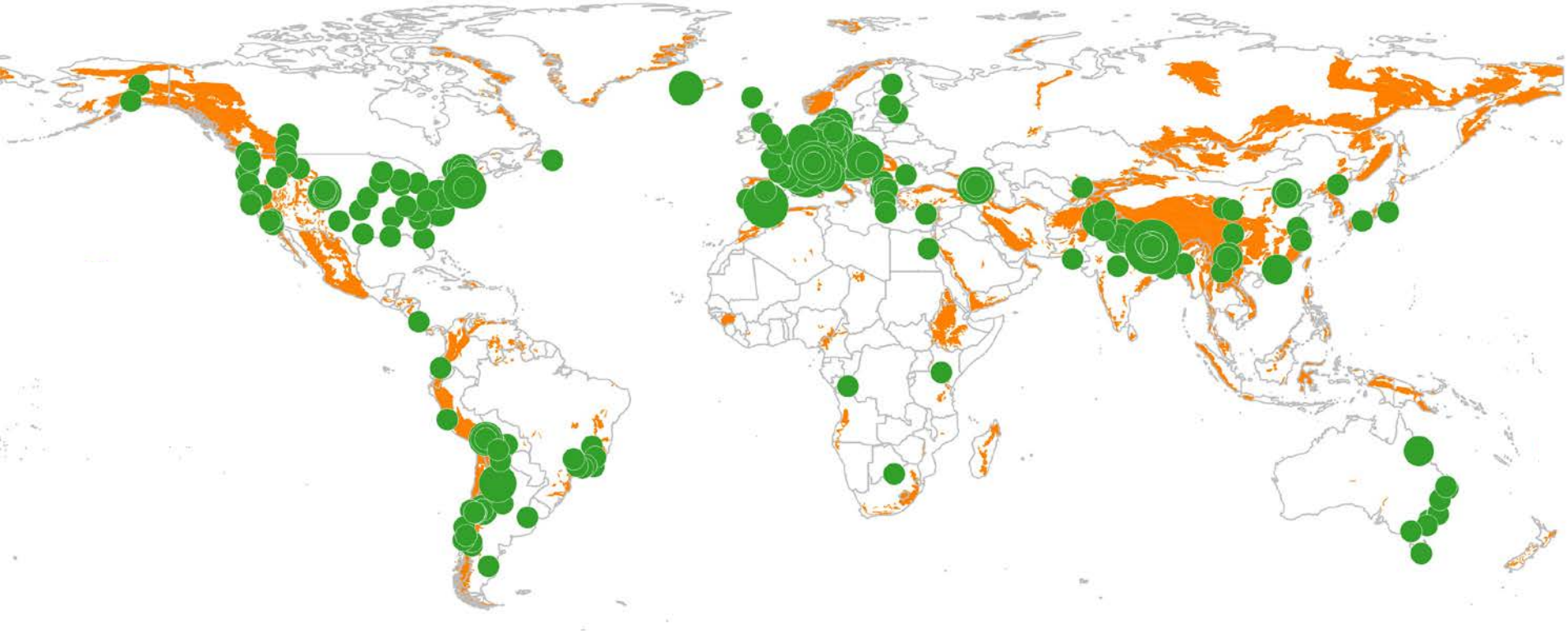
Facts & Figures

- What: “infrastructure” project of the Swiss Academies of Sciences & Global Research Project of Future Earth
- When: 2000 –
- Where: University of Bern, Switzerland
- International Project Office: Markus Fischer (PI), Eva Spehn, Davnah Payne, Mark Snethlage
- Scientific Steering Committee: incl. Susanna Venn, Christian Körner, Laszlo Nagy, Harald Pauli, Nigel Yoccoz

Mission and goals

- Support mountain biodiversity community
  - Research & collaboration
  - Access to resources (experts, data, etc)
  - Interaction with stakeholders & policy makers
  - Contribution to sustainable development

Network



Countries: ~80 Organisations: ~850 Experts: ~1000

Products

- Mountain Portal
  - Mountain definition
  - Treeline algorithm
  - Bioclimatic belts
  - Mountain inventory

Instruments

- Working groups
  - Platform for research
  - Facilitates intellectual exchange among small teams of scientists, stakeholders, and other members of the mountain biodiversity and sustainability science community
  - Outputs: scientific publications, research tools, and project proposals

- Workshops and Conferences

GMBA & LTER

Past

Sites & Workshops

- LTER working group
- Core sites

Tyrolean High Alps (Austria)	Valle d'Aosta (Italy)
Sierra Nevada (Spain)	Collelongo - Selva Piana (Italy)
Aigüestortes & Redon (Spain)	Furka Region (Switzerland)
Ordesa y Monte Perdido / Huesca ES (Sp…	Pyramid Lakes (Nepal)
Niwot Ridge (USA)	

- Workshops 2011-2013
  - Col du Lautaret (2011): use of common protocols to ensure comparability of data
  - Aosta Valley (2013): procedure for testing common protocols to ensure comparability of data

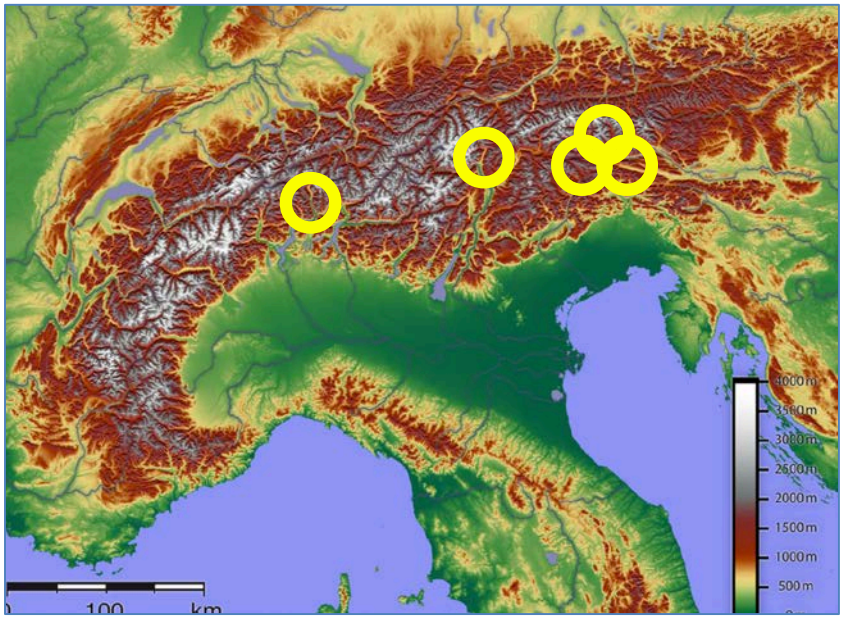
GMBA & LTER

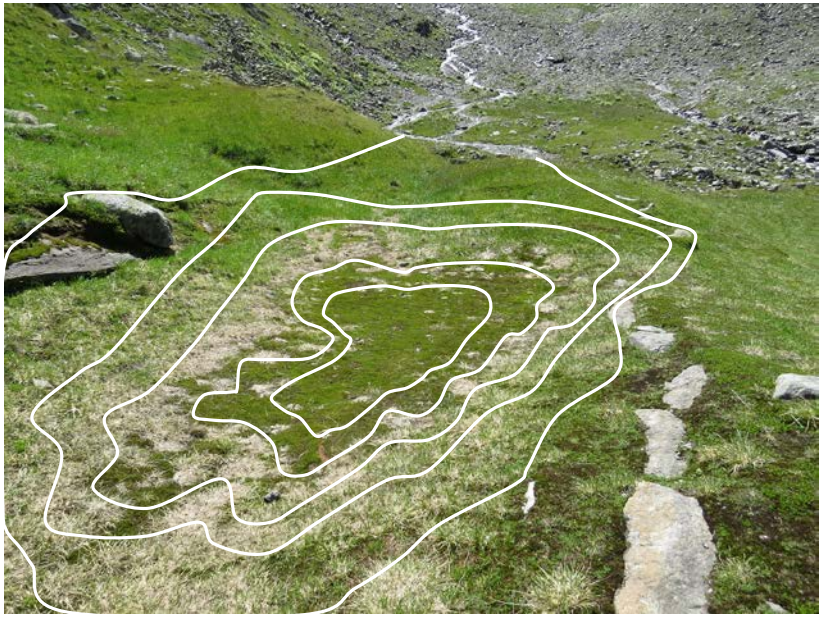
Past

Present

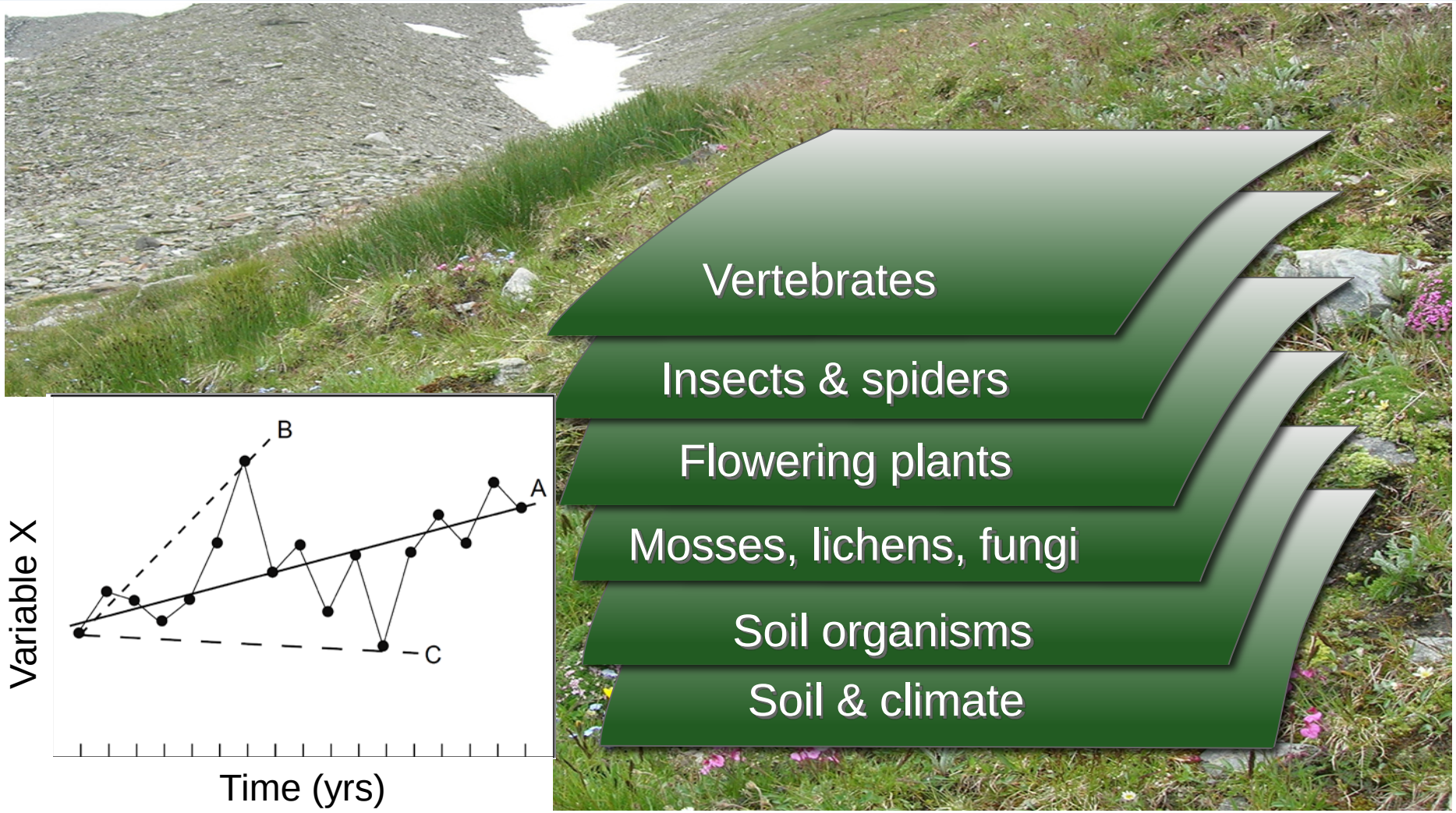
LTER across the Alps (1)

- Comparative, long-term ecosystem monitoring across the Alps: Austrian Hohe Tauern National Park, South-Tyrol (Italy) and the Swiss central Alps (Körner, Tappeiner, Newesely)
  - Topography
  - Snow beds



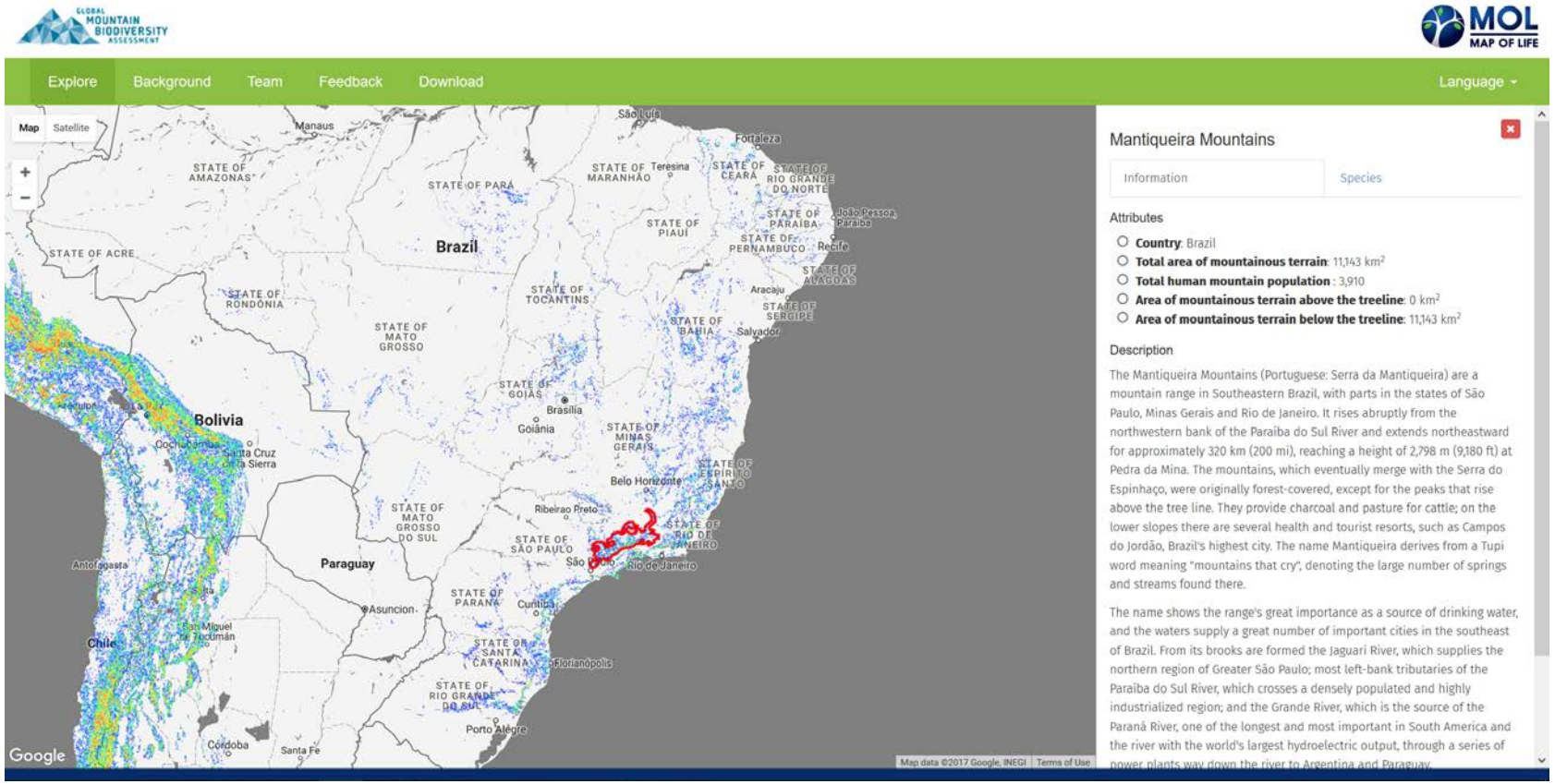


LTER across the Alps (2)



LTER in the Andes

- Long Term Ecological Research site in Campos de Jordao, Serra da Mantiqueira, Brazil (Laszlo Nagy)



GMBA & LTER

Past

Present

Future

Model-based LTER in Mountain Areas (1)

- Working group on - and network of model-based monitoring programs for supporting management decisions

- “What should we begin measuring now that can help society better understand and manage natural resources by 2050 (and beyond) and, in turn, guide human societies through a likely transition to a less bountiful world?”

- “A new dialogue needs to emerge that emphasizes the importance of implementing appropriately stratified ecosystem specific, site-based monitoring that can detect change and explain the drivers of that change”

(Lindenmayer et al., Austral Ecology, 2015)

Monitoring: why, what, how (1)

- Why to monitor?
  - (1) Focus on learning & developing an understanding of the behaviour and dynamics of the monitored system
  - (2) Focus on providing information that is useful in making informed management decisions

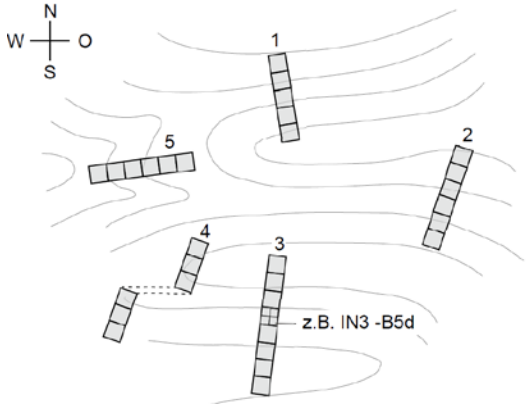
- What to monitor?
  - Decisions about which variable to monitor determined by objectives of the program (i.e., answer to question why)

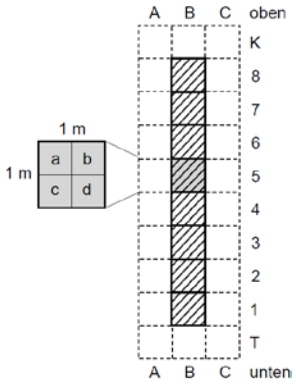
(1) → State variables + associated rate parameters important to a priori hypothesis of system behaviour

(2) → State + other variables included in objective function + variables needed to model managed state variables

Monitoring: why, what, how (2)

- How to monitor: based on hypotheses / models
  - Outline known or assumed functioning of ecological systems
  - Define adequate monitoring targets and their inter-relations
  - Predict the state of monitoring targets when subjected to drivers of change
  - Model-based sampling design
    - Sampling intensity
    - Temporal & Spatial resolutions and extents





Model-based LTER in Mountain Areas (2)

- Working group on - and network of model-based monitoring programs for supporting management decisions
  - Context-specific hypotheses & predictions in mountain ecosystems + development of monitoring targets
  - Protocols & models
  - Shared understanding of drivers and responses

- GMBA network of experts to advise on specific mountain systems & management requirements

Model-based LTER in Mountain Areas (3)

- Facilitate integration of results and knowledge along spatial scale

- Support syntheses of outcomes for policy-relevant recommendations
  - Support information management architecture to achieve, analyze, and reuse the data at appropriate scale
  - Outreach and communication