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Markus Leitner

Alpine Space

Climate change and the need for adaptation

The Future of Mountains after Doha – will the big melt continue, UNEP Vienna, 11 December 2012

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Steep slopes Avalanches
Origin of rivers Mud or debris flows

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Glaciers Snow Permafrost

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250 years records of climate data for the Alps show ...

...the Alpine Space is affected stronger than other regions within and beyond Europe

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Klimawandel: Großvenediger verliert Gipfelkreuz - Spendenaktion

Summer and Fall 2012:

- very strong melting at Großvenediger – summit cross fell over
- climate change effects high mountain areas very massive

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Glacier melt **Permafrost thawing** **Soil erosion** **Decreasing snow cover**

Changing river runoff patterns **Water scarcity** **Groundwater renewal** **Water quality**

Heat **Drought** **Natural hazards** **Flood risk**

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- 2°C increase of the annual mean temperature compared to pre-industrial times – more than twice the rate of average global warming
- Accelerating warming rate over the past decades - higher than predicted by climate models just ten years ago

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CHANGE AHEAD

- All economic sectors of spatial development, regions and citizens in the Alpine Space will be directly and indirectly affected
- Limited settlement space
- Land use demands for development
- Expansion of hazard zones
- Land for development is becoming a scarce resource in many Alpine regions, potentially intensifying spatial conflicts over land use

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- Changes in precipitation patterns aggravate pre-existing differences between a wetter Northern part and drier leeward part of the Alps in the South
- Summers tend to become generally drier
- Stronger weather extremes and a higher variability in weather conditions are to be expected

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Monitoring Climate Change in the Alps

Scientific Basis - Global Observation Research Initiative in Alpine Environments – GLORIA

- A study has found that all across Europe, plants are moving to higher altitudes <http://www.sciencemag.org/content/336/6079/353.full>
- Billed as the first pan-continental study of the impact of climate change on Europe's flora, the research warns that while the scientists found more species being observed on mountain tops, the change is leading towards less species diversity overall.
- For example, while central and northern European summits exhibit greater species richness, numbers were stagnant or declining at "nearly all sites in the Mediterranean region".
- Even where the number of plant species is increasing, the study finds, some alpine species are being crowded out

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Adaptation to climate change is a process

Adaptation needs to be integrated in our planning and risk management procedures

Successful adaptation shall give us the capacity to manage changing conditions over time, while maximising benefits and minimising costs

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Example C3-Alps

Alpine Space - transnational capitalisation project - building on the results of previous projects and initiatives on adaptation to climate change in the Alps,

- C3-Alps seeks to synthesize, transfer, and implement in policy and practice the best available adaptation knowledge by
 - applying a knowledge transfer concept driven by the information and communication needs of target groups, the project optimizes the usability of available knowledge resources in an attempt to bridge the gap between the generation of adaptation knowledge and its application in real-world decision-making.
- supports bottom-up adaptation measures in Alpine regions and municipalities, contributes to the implementation of national adaptation strategies, and disseminates Alpine adaptation capital within the Alpine community and beyond.

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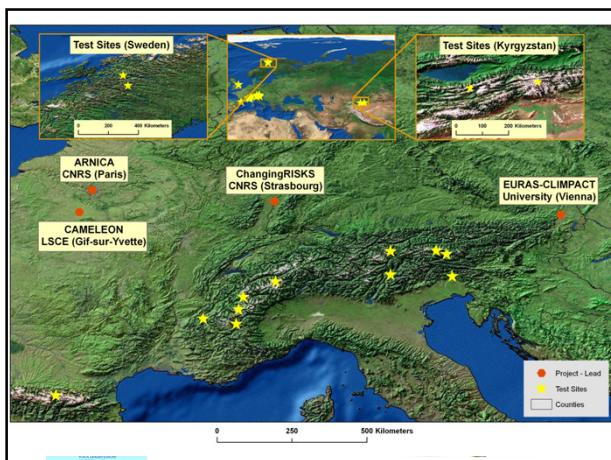
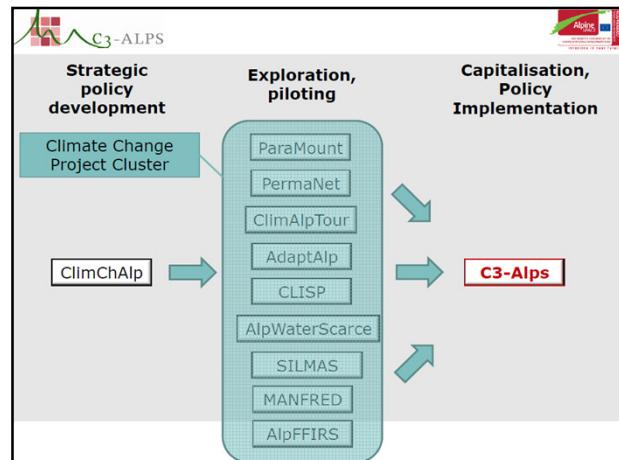
Example CIRCLE-2 MOUNTain

| Acronym | Name |
|-----------------------|--|
| ARNICA | Assessment of Risks on transportation Networks resulting from slope Instability and Climate change in the Alps |
| FURAS-CLIMPACT | Impact of climate change and related glacier hazards and mitigation strategies in the European Alps, Swedish Lapland and the Tien Shan Mountains, Central Asia |
| Changing RISKS | Changing pattern of landslide risks as response to global changes in mountain areas. |
| CAMELEON | Carbon dynamics in Mountain Ecosystems: analyzing Landscape-scale Effects Of anthropogenic changes (climate and land-use) |

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Project idea & capitalisation approach in a nutshell

- Generating and providing a synthesis inventory of **CC(IV)A knowledge** that is **harmonized across sectors, usable and useful** to decision-makers, and driven by user needs of target groups
- **Knowledge transfer and communication** to target groups (decision-makers, stakeholders, users)
- Analyzing performance of existing adaptation policies and enhancing **governance systems** that the **adaptation science-policy chain** is embedded in
- Informing, supporting, preparing, and initiating the **actual use and implementation** of adaptation knowledge in policy-making and practice.

⇒ Supporting bottom-up action on regional adaptation strategies

⇒ Contributing to implementation and advancement of national adaptation strategies

⇒ Enhancing policy coherence

Capitalisation: „Moving from outputs to impacts!“

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Austrian Adaptation Research Efforts

- ACRP – Austrian Climate Research Programme
 - Already 5th call 2012, started with 1st call in 2008
 - <http://www.klimafonds.gv.at/foerderungen/projektberichte/forschung/>
- StartClim – Climate Research programm
 - Calls since 2003
 - <http://www.austroclim.at/index.php?id=40>
 - ProVISION for nature and society – ended in 2012
 - <http://www.provision-research.at>
- General Information on Climate Change Adaptation in Austria:
 - ➔ see www.klimawandelanpassung.at and its regular NEWSLETTER

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Austrian National Adaptation Strategy (NAS)

Overall aim

- to reduce anticipated **negative impacts** of climate change on Austria's society, economy and nature
- to use **positive effects** of climate change and allow synergies
- to provide an **overall framework** in which adaptation should take place

Process

- sectoral and iterative approach
- close collaboration with science
- broad stakeholder involvement to support the development of the NAS

➔ Adoption of the federal government on October 23, 2012

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From science to decisions

Creating and maintaining dialogue

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Austrian Adaptation Efforts

- Preparation of a cc mitigation and adaptation Strategy in Lower Austria, envisaged for Tyrol, others to follow;
- Call for Climate Proofing Vienna planning instruments;...

(Research) Institutional Efforts

- Climate Change Centre Austria – CCCA
 - officially established in July 2011 as a coordinating facility to promote and support climate research in Austria
 - More than 20 partner institutions
- Climate Service Center – CSC
 - Established in summer 2012
 - Shall provide and adequately prepare climate information, data, climate change related sources and impacts for society

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Umweltbundesamt - Environment Agency Austria
<http://www.umweltbundesamt.at>
www.klimawandelanpassung.at - Newsletter on climate change adaptation for Austria

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