

Bridging scales in the extremes: from global climate change to local adaptation

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The Human Side of Climate Change
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Extreme

“Climate extreme (extreme weather or climate event): the occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable.” (IPCC, SREX 2012)



“For simplicity, both extreme weather events and extreme climate events are referred to collectively as ‘climate extremes’” (IPCC, SREX 2012)

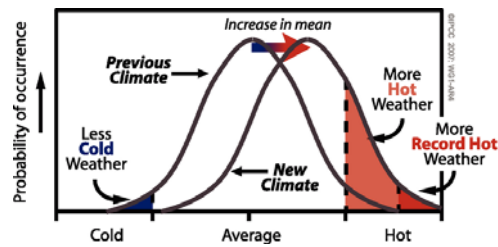
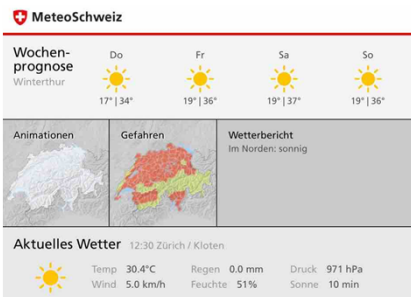
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Extreme

Extreme precipitation, extreme high temperatures, extreme cold, extreme megadrought, extreme flood, extreme wet and dry spells, storm, hurricanes, ice storms, ...



Extreme



Weather

Climate

Impacts of extremes

- Extreme impacts
- Socio-economic development
- Vulnerability
- Exposure

Dealing with extremes

- Disaster risk management
- Adaptation
- Decision-making

Scales

Dealing with **different scales** in assessing, understanding and responding to extreme weather and climate events

Spatial

Temporal

Interface

Society

Policy



Science

Society - private sector



Extreme precipitation
Extreme drought

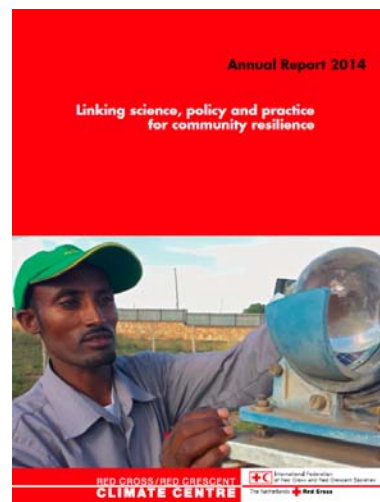


Extreme wind

Society - NGO



- Early warning, early action
- Forecast-based financing



Society - individual



Extreme precipitation
Extreme water level



Extreme drought

Policy - national/regional



- Land use planning
- Civil protection and emergency planning
- Project and policy appraisal



Policy - local



Extreme precipitation & Urban drainage system



Extreme flood & Building regulations

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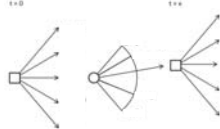
Science

De Bruin (2011), Russo et al. ERL 2015, subm., Thorarinsdottir (2015), Susan Joslyn's (<http://depts.washington.edu/forecast/>), www.uib.no/en/project/lingclim, EVA project



Social science

Economic-based appraisal techniques, e.g. decision tree analysis under uncertainty



Spatial knowledge of drought-prone farmland through participatory drought mapping



Humanities

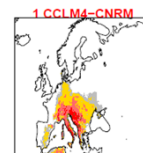
LINGCLIM – Linguistic Representations of Climate Change Discourse and Their Individual and Collective Interpretations

Decision-making with uncertainty Lab – uncover the psychological factors that impact decisions on precautions for severe weather



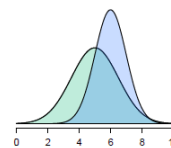
Natural science

Heatwave occurrence in near-term regional climate projections



Russo et al. 2015, ERL, sub.

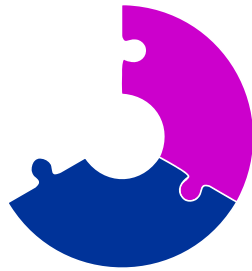
Statistical analysis of climate projections



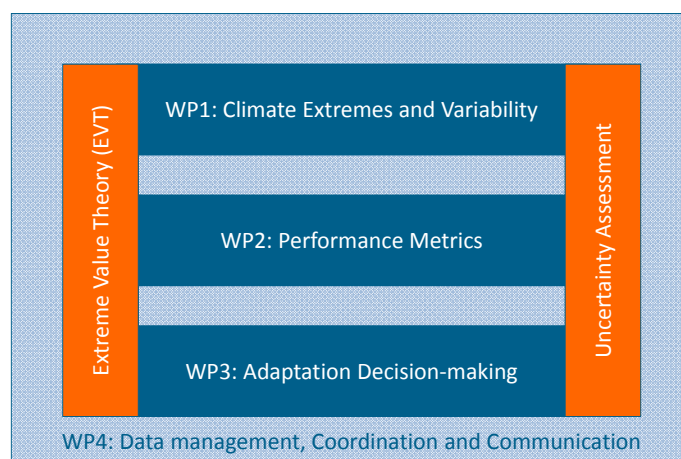
Integrated Research Approach




ClimateXL – Physical and statistical analysis of climate extremes in large datasets



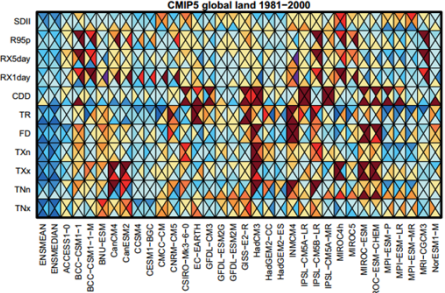
ClimateXL



ClimateXL 

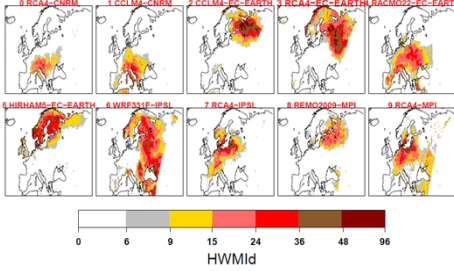
Climate extremes on global scale

- Observations and climate models
- Future projections



CMIP5 global land 1981-2000


Sillmann et al. 2013




RCP2.6 2011-2040


Heatwave occurrence

Russo et al. 2015, ERL, sub.


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ClimateXL 

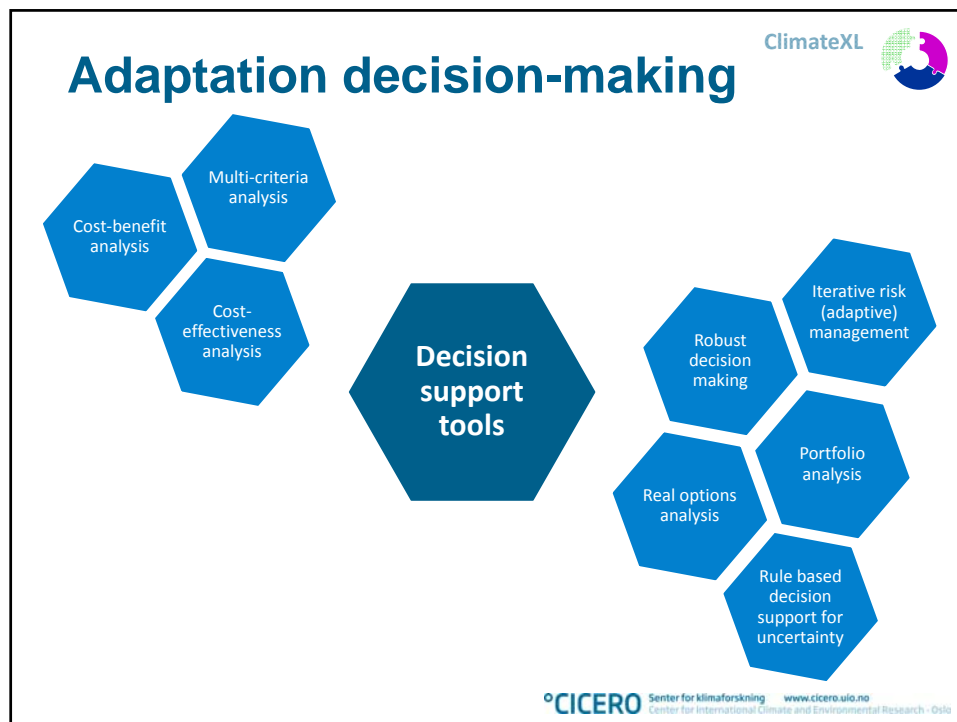
Practitioners



- Whether to adapt?
- What to adapt?
- How much to adapt?
- When to adapt?

Adaptation decisions
 Dealing with uncertainties


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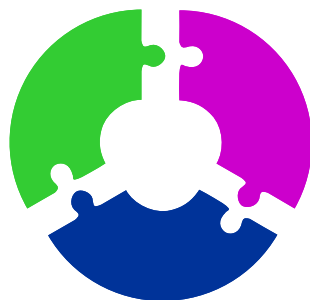


Challenges

- Adaptation challenges in the decision context
- Bridging and balancing scales
 - Tailored climate information
 - Uncertainty
 - Temporal
 - Spatial

Further integration

Society

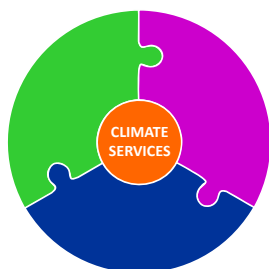


Policy

Science

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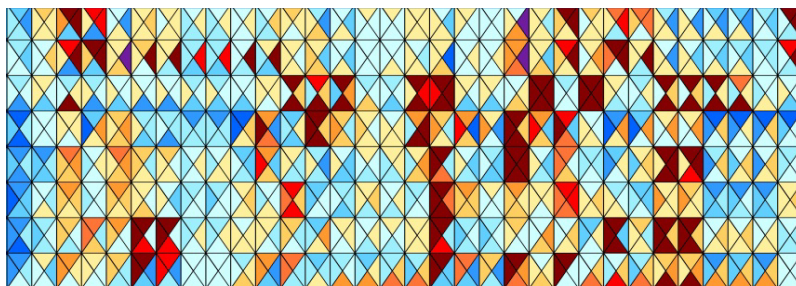
Climate services



- Iterative decision-making processes
- Three way process between society, policy and science
- Balancing scales

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Thank you for your attention



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