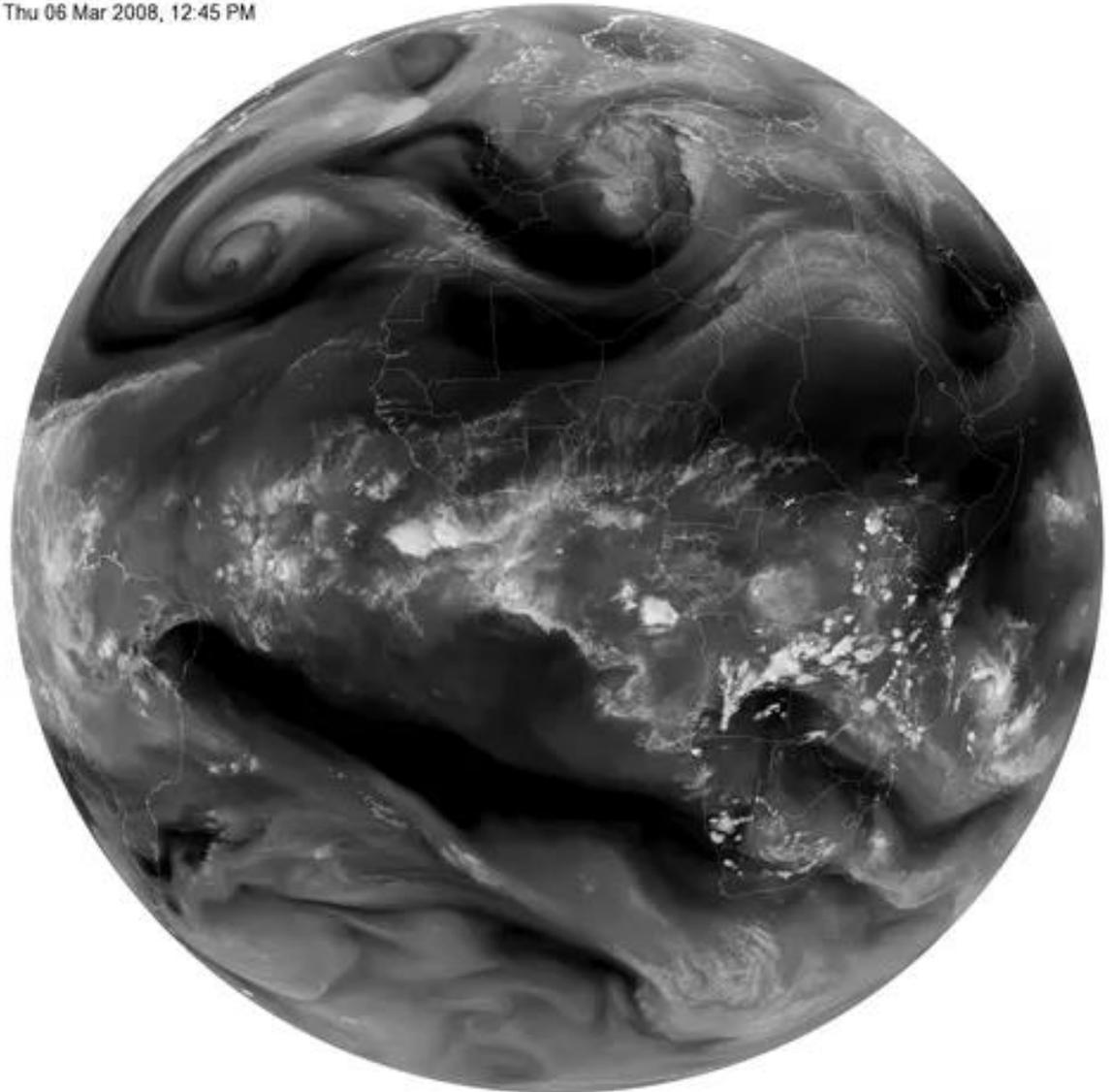


African Impact Atlas: a systematic analysis of impacts in Africa under different climate change scenarios

Thu 06 Mar 2008, 12:45 PM



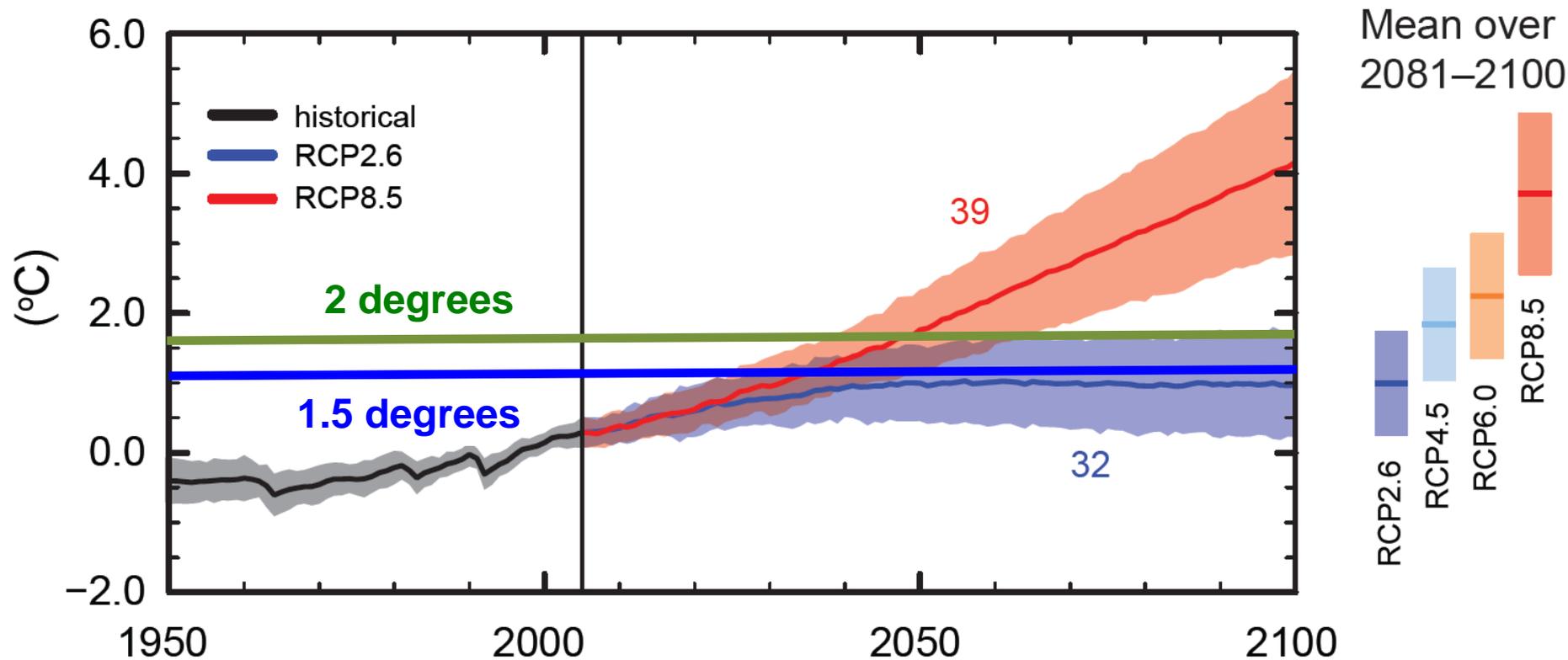
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Motivation

Figure SPM.7a

Global average surface temperature change

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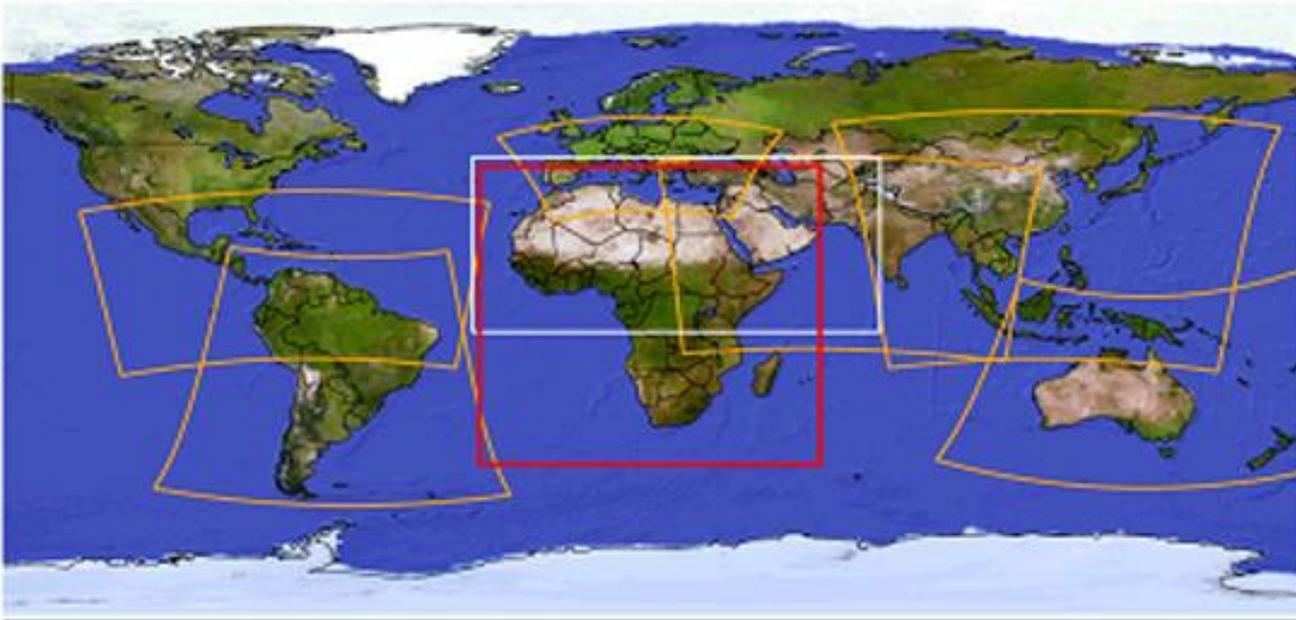
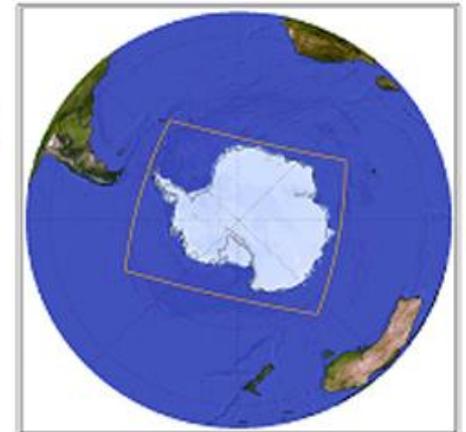
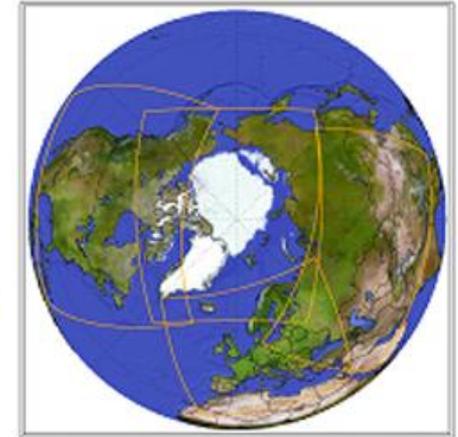
But we operate at the decision-scale, which is....

- **Place based**: large-scale averages are of limited value
- **Attribute based**: dependent on *characteristics* of a change
- **Time based**: have a time horizon of consequence
- **Relevance based**: climate may or may not be important
- **Institutionally based**: legacy, politics and champions
- **Context based**: compounded by non-climate stressors
- **Compound**: interactions of multiple variables in space and time

Information is therefore needed at these scales....

....which requires **regional** climate information.

The CORDEX vision is to advance and coordinate the science and application of regional climate downscaling through global partnerships.



CORDEX data available for Africa

- Altogether **55 scenario simulations** are publically available for CORDEX Africa in addition to evaluation simulations.
- Available ensemble consists of simulations conducted **with 6 different regional model** downscaling input data **from 11 global models**
- Simulations are available for three different emission pathways
 - - 12 simulations for RCP2.6
 - - 22 simulations for RCP4.5
 - - 21 simulations for RCP8.5
- More simulations will become available soon

Cordex – Africa

A – Analysis; developing methods and tools to analyse atmospheric processes over Africa and how these may change into the future

F – Foci; addressing key meteorological and impacts knowledge gaps

R – Regional messages; presenting information for key regions of the continent

I – Integrated approach; bringing together climate and vulnerability-impact-adaptation scientists and relevant actors to identify and address key climate vulnerabilities

C – Capacity development; long-term collaboration between African scientists and key global institutions for career development

A – Application and Adaptation; bridging the science-society divide through transforming climate data into actionable information



Proposal

A systematic regional analysis of 1.5, 2 and 4°C global temperature projections, to assess **threshold exceedance** in key African sectors including health, water, agriculture and energy.

Thresholds are embedded in just about all climate change information needs.

Systems operate within design parameters, attributes of how and when these parameters may be exceeded is important.

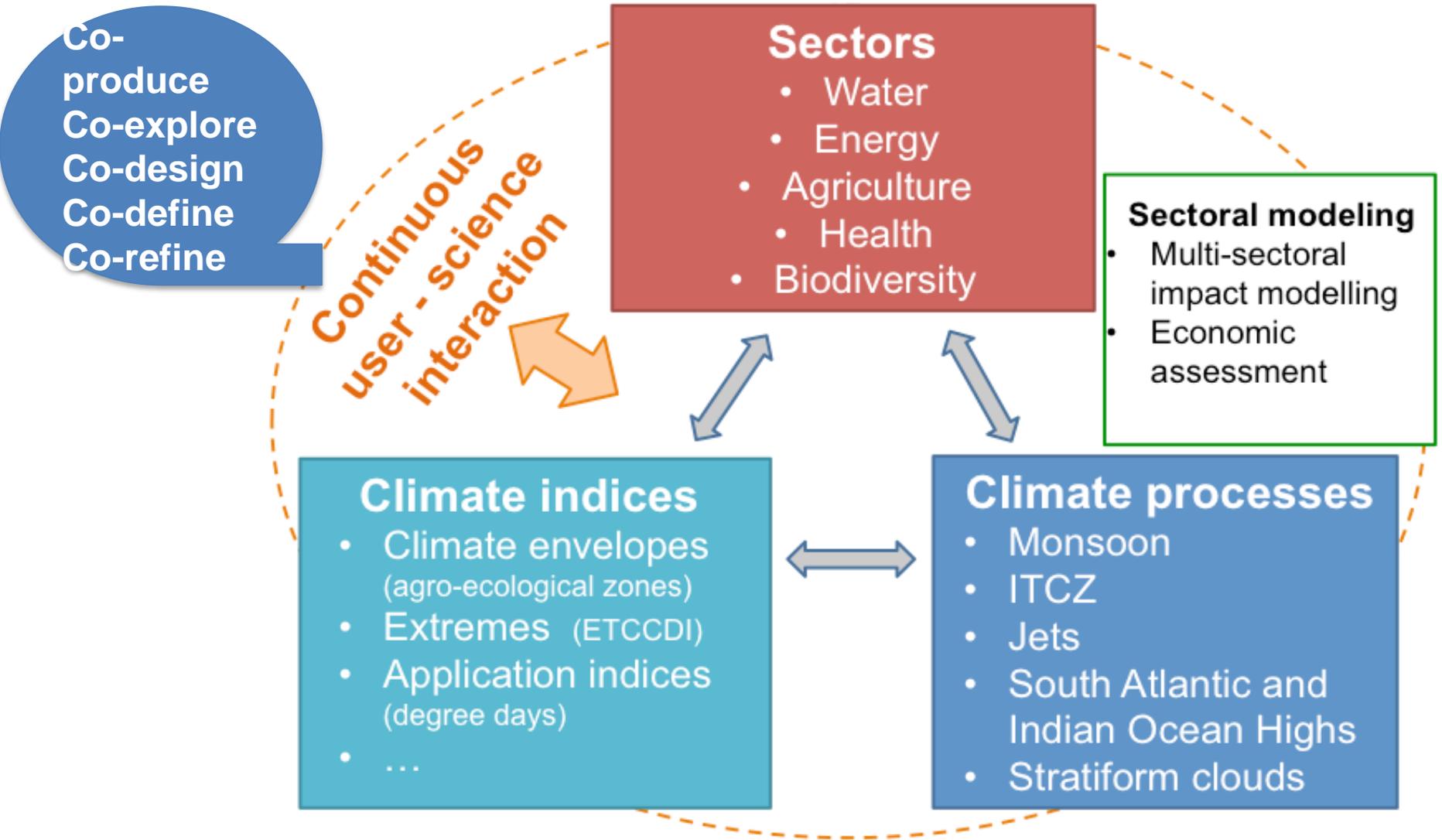
Information about thresholds:

- Exceedance **magnitude**
- Exceedance **frequency**
- Exceedance through **combinations**
- Exceedance by **compound effect** of two lesser changes
- **Proximity** to threshold under current climate
- **Consequences** of exceedance

Questions we would like to address

1. How can a **CORDEX** based analysis be positioned within existing global model based analyses, products and scientific literature?
2. Do **existing indices/metrics** adequately describe attributes of particular systems (climate and sector-specific)?
3. Is it possible to identify **thresholds** that if exceeded stress the system? **When** are these thresholds crossed (e.g. **energy demand**)?
4. What climate processes/drivers are **causing** this change (**scales**)?
5. Is there a **combination** of multiple processes that cause threshold crossings (e.g. **water balance**)?
6. What are the **implications** of threshold exceedances in sector specific contexts (e.g. **river and dam management**)?
7. What are potential economic cost implications of **delayed mitigation** (e.g. **for agricultural GDP**)?
8. How do we **communicate** this information effectively and ethically (e.g. **presentation of information with limitations/caveats**)?

Analysis approach



Regional expertise is essential to develop this information which requires good links between African and other institutions - this is a strength of CORDEX-Africa (broader

Communication

Based on **state-of-the-art transdisciplinary science**, results will be combined in a user-friendly, sector specific, **online atlas** that includes measures of robustness and limitations.

Sector information

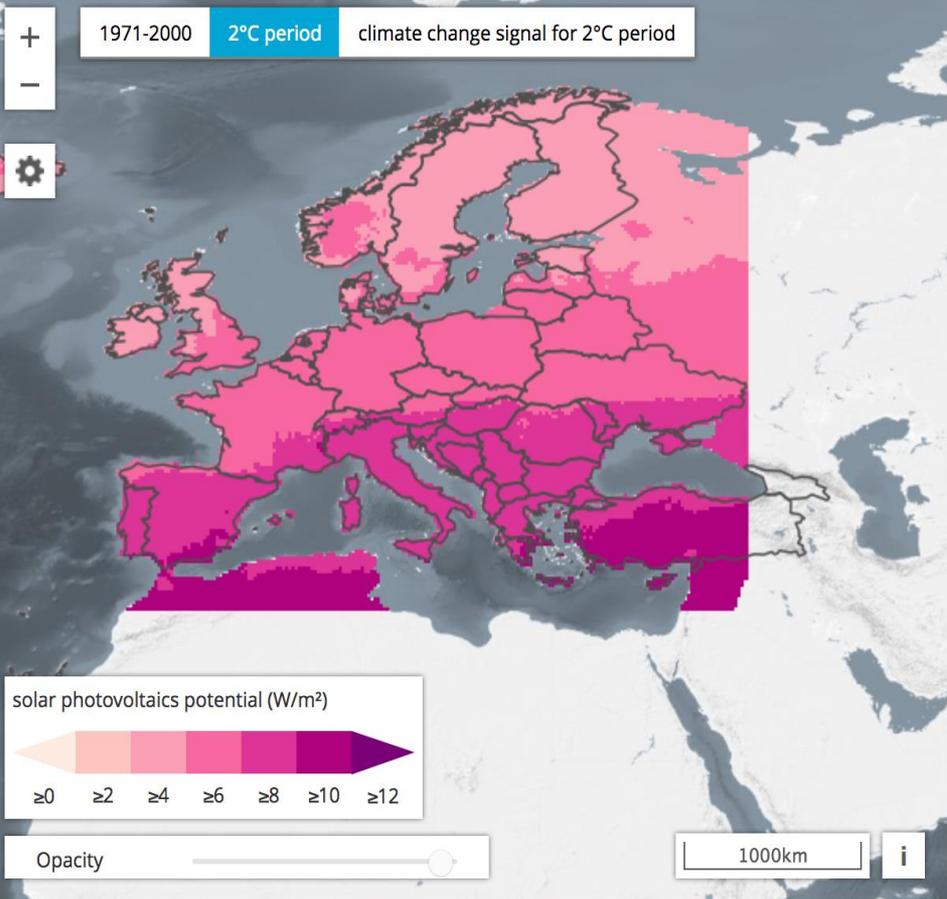
- Suitability maps that indicate timing of transitions between states (e.g. agriculture good, medium, poor) and transitions from each state
- How do the suitability states differ under 1.5, 2 and 4 degree global warming level?
- Atlas of potential costs of delayed mitigation a different scales (country, economic zones)

Climate process information

- Change in particular processes under 1.5, 2 and 4 degrees
- Emerging new climates

Example – Impact2C web atlas

- About the IMPACT2C web-atlas
- About the IMPACT2C project
- Glossary



Solar Photovoltaics Potential (energy sector)

Key messages:

- Solar photovoltaics potential is projected to decrease over most of Europe, except over southern countries where it is projected to hardly change
- The change is projected to be below 5% (to 10%) over most of Europe
- There is a high level of agreement among models over northern European countries

Why is the content of this map important?

The solar photovoltaics (PV) industry has experienced rapid growth in recent years. Changes in climate variables such as cloudiness, solar radiation, and temperature can affect the potential for PV power generation. Therefore, such impacts need to be assessed in the context of rapid PV deployment.

Which sectors are affected by this result?

The PV sector, and more broadly the electricity sector, are vulnerable to changes in climate variables, such as solar radiation and temperature. The assessment of changes in PV potential is informative for planning and executing activities in the PV industry. It may also be beneficial for energy-climate policy makers.

What is shown on the maps?

The PV potential exhibits a positive gradient from northern to southern Europe, consistently with the solar resource. According to most models, decreases in mean

What can we do? Based on “committed” funding (~Euro 200 000 for the first year 2017 with similar investment until 2020)

- Limited CORDEX RCM-based analysis of few “important” climate processes and indicators
- Selected stakeholder engagement within the current CORDEX-Africa expertise context
- Metrics analysis/development for selected indicators in climate and sectoral contexts
- Spatial scale is continental, not an in-depth regional analysis
- Atlas with results of analysis
- Contribution to the IPCC special report on 1.5 degrees warming

What we would like to do (requires funding source)?

- Information included in the basic plan
- Expanded stakeholder engagement to include more sectors; better opportunity for co-exploration and co-production of information
- Expanded CORDEX-Africa network
- Have an in-depth regional focus with climate and sector analysis
- *Multi-sectoral impact modelling*
- *Assess economic costs of delayed mitigation*
- **Deliver tailored information that are more relevant/useful for decision-making through the Atlas**