Regional climate simulations for the impact of climate change over the CAS-CORDEX domain


17-10-2019
How will our ecosystems evolve in the future?
Impacts of **climate change** and **extremes** on the **Agriculture** and **Forestry** in the **Europe-Russia-Turkey** Region.
Stakeholder interaction

Russia

Latvia

China

Xinjiang Institute of Ecology and Geography
Chinese Academy of Sciences
How to reach our goal?

- Arctic CORDEX
- North America CORDEX
- Central America CORDEX

- EURO-CORDEX
- MED-CORDEX
- CORDEX Africa
- MENA-CORDEX

- Central Asia CORDEX
- South Asia CORDEX
- East Asia CORDEX
- South East Asia CORDEX
- Australasia CORDEX

- South America CORDEX
- CORDEX Antarctica
How to reach our goal?

- Arctic CORDEX
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- Central Asia CORDEX
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  - Australasia CORDEX

- South America CORDEX
- CORDEX Antarctica
EURO - CORDEX

RCMs: > 30
Highest resolution: 0.11°

CAS - CORDEX

RCMs: ONLY 1
Highest resolution: 0.44°
EURO - CORDEX

RCMs: > 30
Highest resolution: 0.11°

CAS - CORDEX

RCMs: ONLY 1
Highest resolution: 0.44°

NOT sufficient!
ALARO & REMO

- Applied over Central Asia at 0.22° (25 km) resolution
- Both RCMs intensively used and evaluated over Europe

Experimental setup
- The CAS-CORDEX domain: Region 8
- Climate impact: CMIP5 driven simulations
VALIDATION: mean temperature
VALIDATION: mean temperature

Explanation bias

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<th>CRU</th>
<th>ECMWF ERAINT</th>
<th>BIAS ERAINT-CRU</th>
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near-surface air temperature, [°C]

difference,[°C]
VALIDATION: precipitation

DJF
CRU: 1980-2017
REMO - CRU
ALARO - CRU

MAM

JJA

SON
VALIDATION: precipitation

Explanation bias
PROJECTIONS

Projections to estimate the future climate
- Historical reference runs: 1976 - 2005
- Future runs: 2006 - 2099
- Different configurations:
  - ALARO driven by CNRM-CM5
  - REMO driven by HadGEM2-ES
  - REMO driven by MPI-ESM-LR
  - REMO driven by NorESM1-M
- Different scenario’s:
  - RCP2.6
  - RCP4.5 (only for ALARO)
  - RCP8.5
PROJECTIONS

RCP 2.6 for 1971 - 2099 compared to historical run

ALARO HIST  RCP2.6-HIST

REMO MOHC HIST  RCP2.6-HIST

-40 0 45

near-surface air temperature, [°C]

-10 -8 -6 -4 -2 0 2 4 6 8 10
difference, [°C]
SUBREGIONS

Similar approach, but more detailed information

- Russia → focus on crop regions
- Latvia
- Turkey
NEXT STEPS

- Use climate data as forcing in impact models
- Study future evolution of agriculture and forestry
- Dissimilation stakeholders

NDVI 300 m resolution (21/06/2016) over the CAS-CORDEX region (Copernicus Land Monitoring Service by VITO)
Impact of climate change and climate extremes on the Agriculture and Forestry in the Europe-Russia-Turkey Region

The ongoing climate change has widespread and consequential impacts all over the world including increasing frequency and intensity of extreme climate and weather events. Despite positive impacts in some regions

Website: www.projectafter.net
AFTER project newsletter: after.newsletter@gmail.com
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