



Session D7: Climate Services developments in the frame of CORDEX and their transferability

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

Top S., Aniskevich S., Bobylev L., Caluwaerts S., De Cruz L., De Maeyer P., De Troch R., Gnatuk N., Gobin A., Hamdi R., Kotova L., Remedio A. R., Sakalli A., Sirin A., Termonia P., Van De Vyver H., Van Schaeybroeck B. and Viksna A.

17-10-2019

# How will our ecosystems evolve in the future?



<https://unsplash.com/photos/-cOPJUAtpSo>



<https://unsplash.com/photos/01Qgkfz-ck8>



<https://www.pexels.com/photo/forest-fire-813908/>



<https://healdsburgshed.com/2014/02/26/drought-growing-tips/>

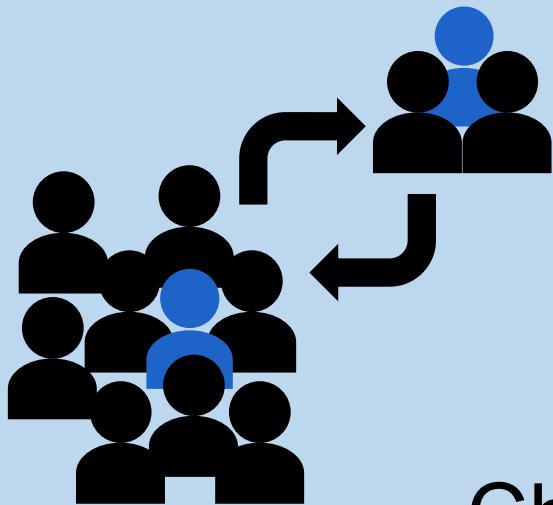


[https://commons.wikimedia.org/wiki/File:Damaged\\_forest.jpg](https://commons.wikimedia.org/wiki/File:Damaged_forest.jpg)

# Impacts of **climate change** and **extremes** on the Agriculture and Fores**T**ry in the **Europe-Russia-** **Turkey Region**



# Stakeholder interaction



Latvia



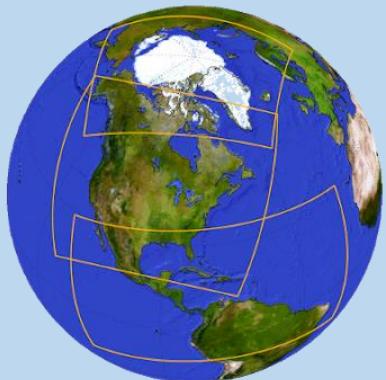
China



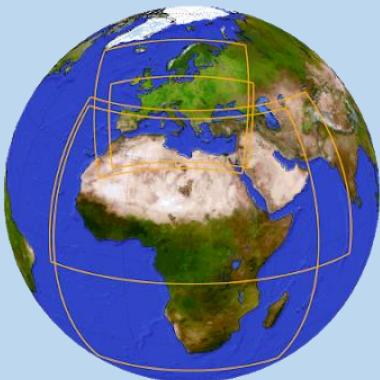
Russia



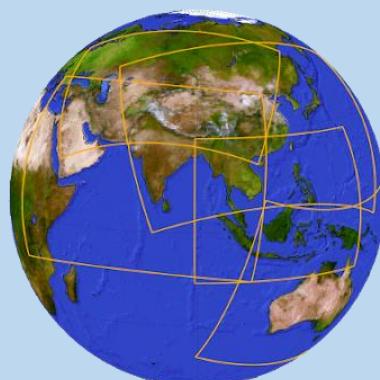
# How to reach our goal?



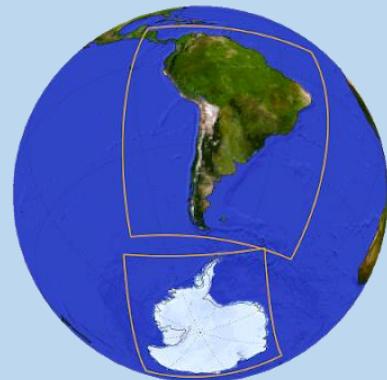
- Arctic CORDEX
- North America CORDEX
- Central America CORDEX



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

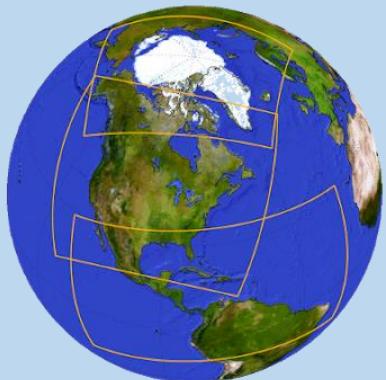


- Central Asia CORDEX
- South Asia CORDEX
- East Asia CORDEX
- South East Asia CORDEX
- Australasia CORDEX

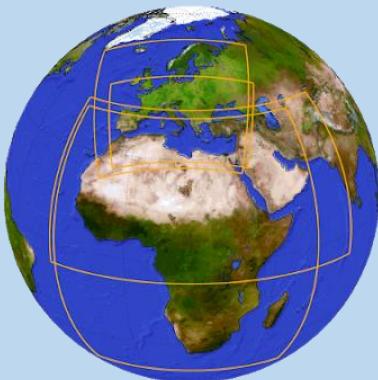


- South America CORDEX
- CORDEX Antarctica

# How to reach our goal?



- Arctic CORDEX
- North America CORDEX
- Central America CORDEX



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



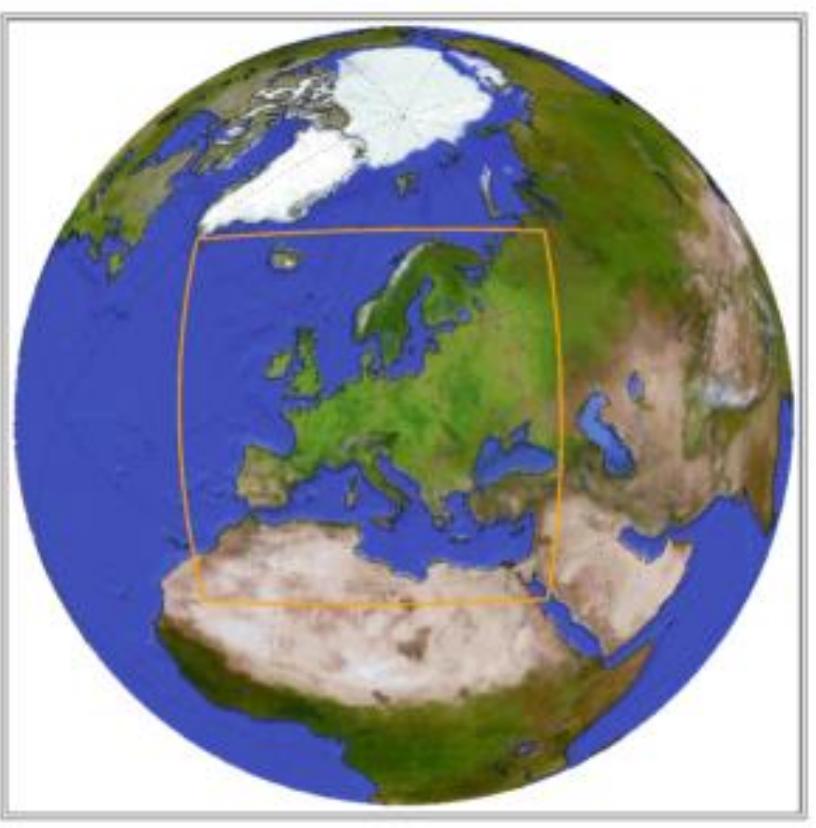
- **Central Asia CORDEX**
- South Asia CORDEX
- East Asia CORDEX
- South East Asia CORDEX
- Australasia CORDEX



- South America CORDEX
- CORDEX Antarctica

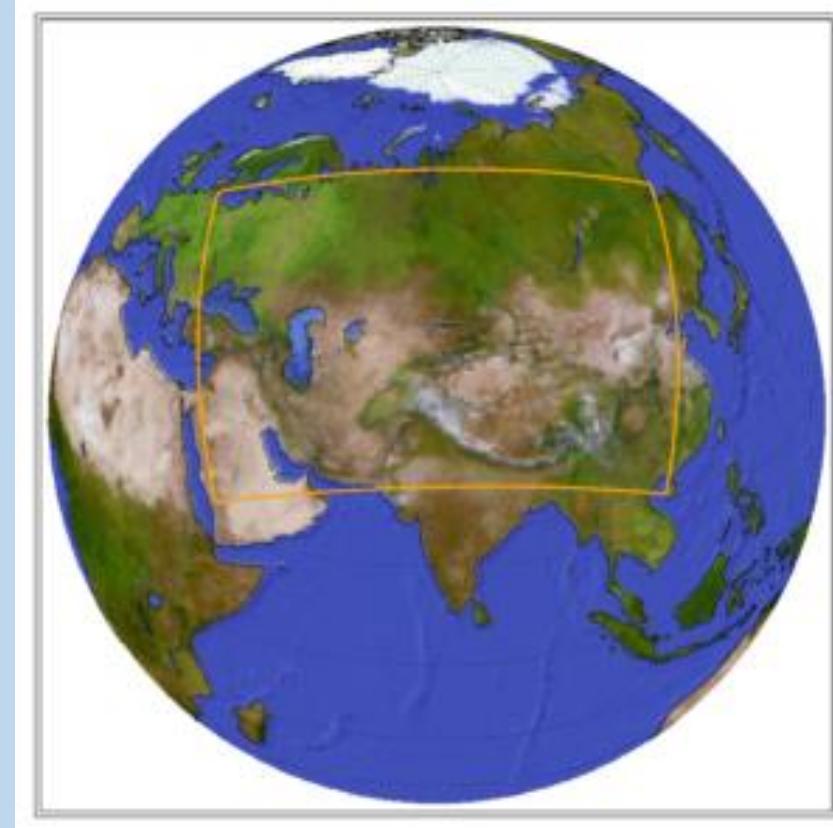
# EURO - CORDEX

# CAS - CORDEX



RCMs: > 30

Highest resolution:  $0.11^\circ$

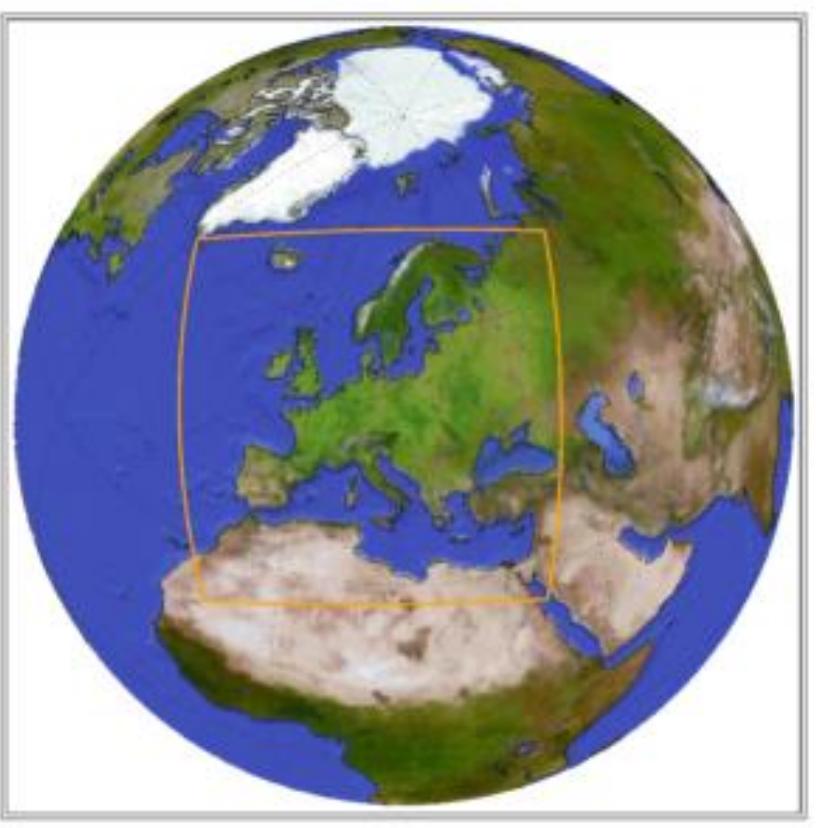


RCMs: ONLY 1

Highest resolution:  $0.44^\circ$

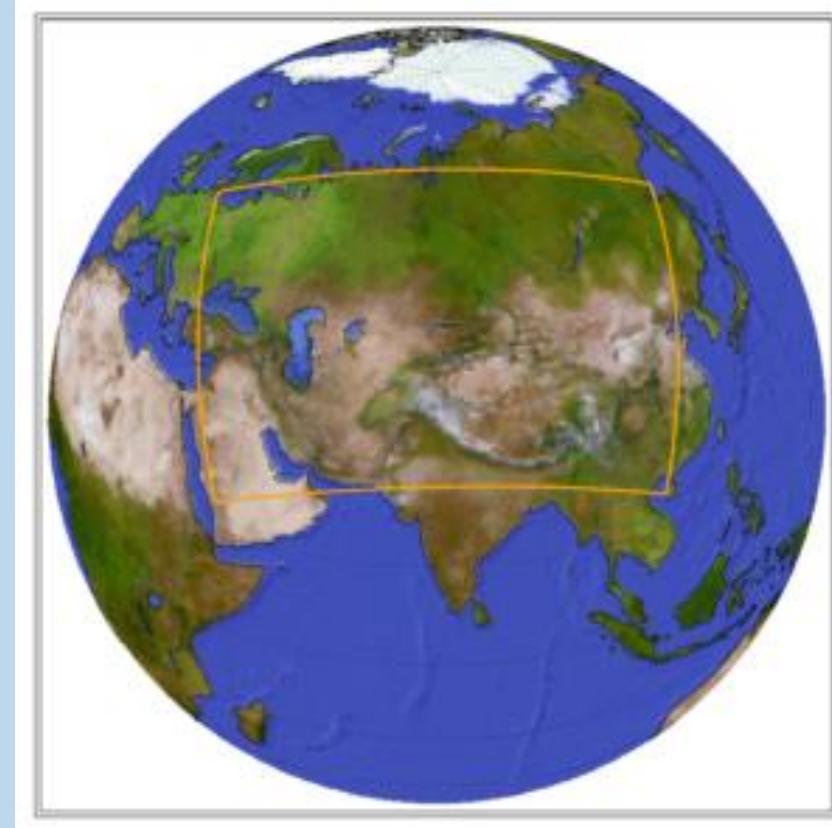
# EURO - CORDEX

# CAS - CORDEX



RCMs: > 30

Highest resolution:  $0.11^\circ$



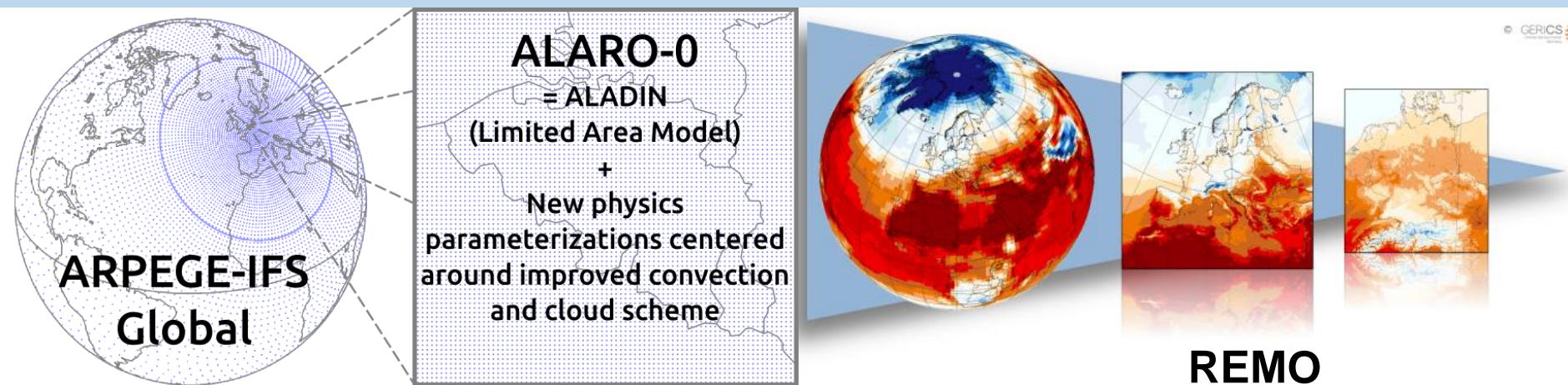
RCMs: ONLY 1

Highest resolution:  $0.44^\circ$

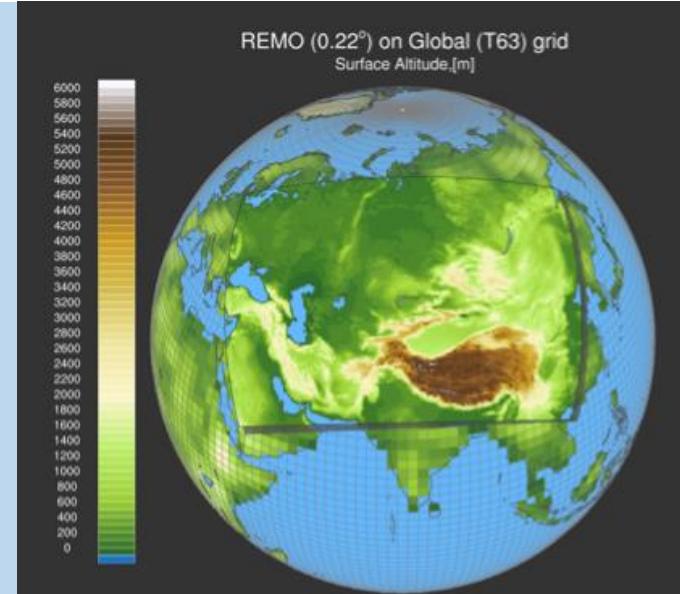
NOT sufficient!

# ALARO & REMO

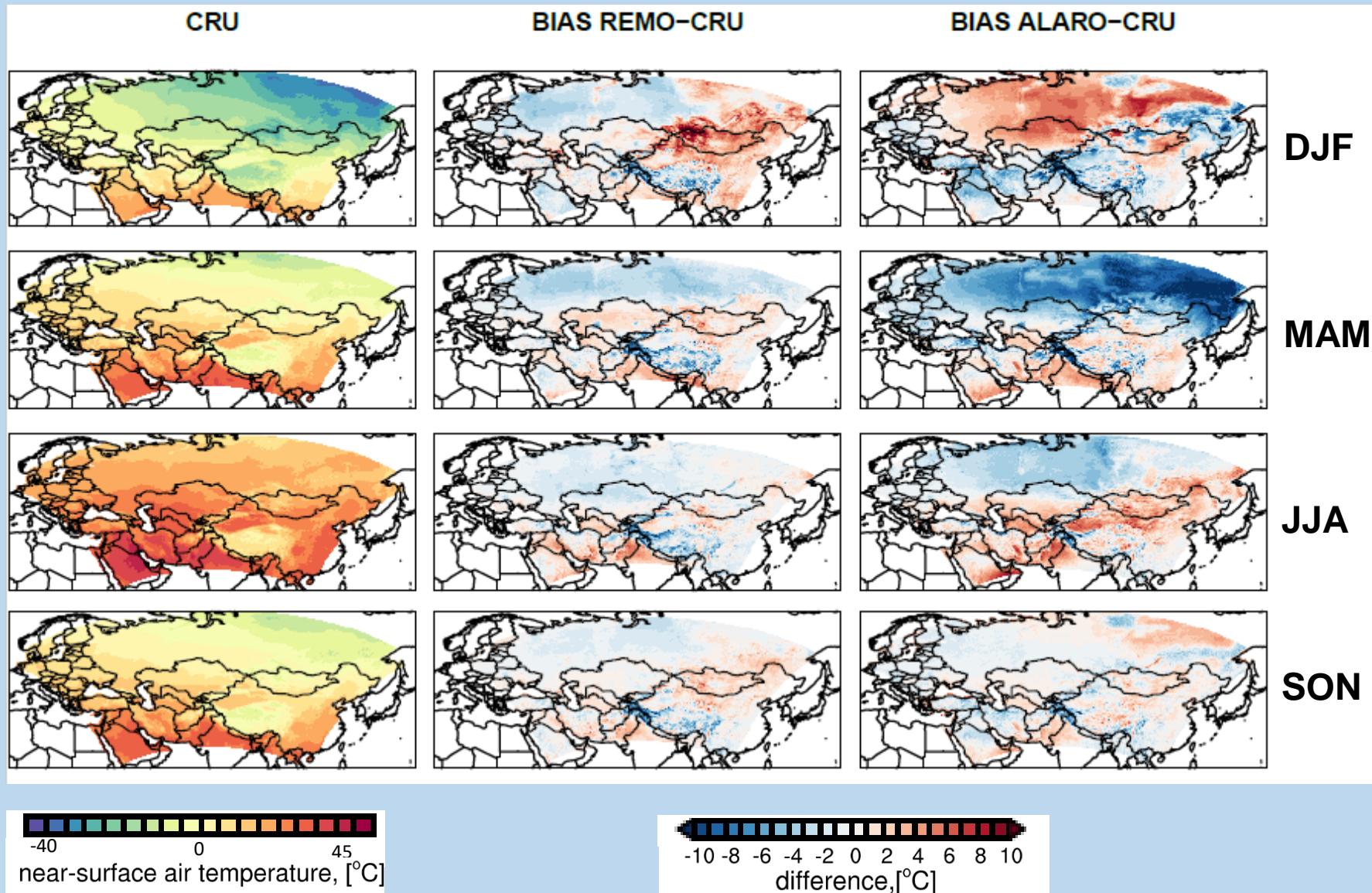
- Applied over Central Asia at  $0.22^\circ$  (25 km) resolution
- Both RCMs intensively used and evaluated over Europe



- Experimental setup
  - The CAS-CORDEX domain: Region 8
  - Evaluation: ERA-Interim: 1980 - 2017
  - Climate impact:  
CMIP5 driven simulations

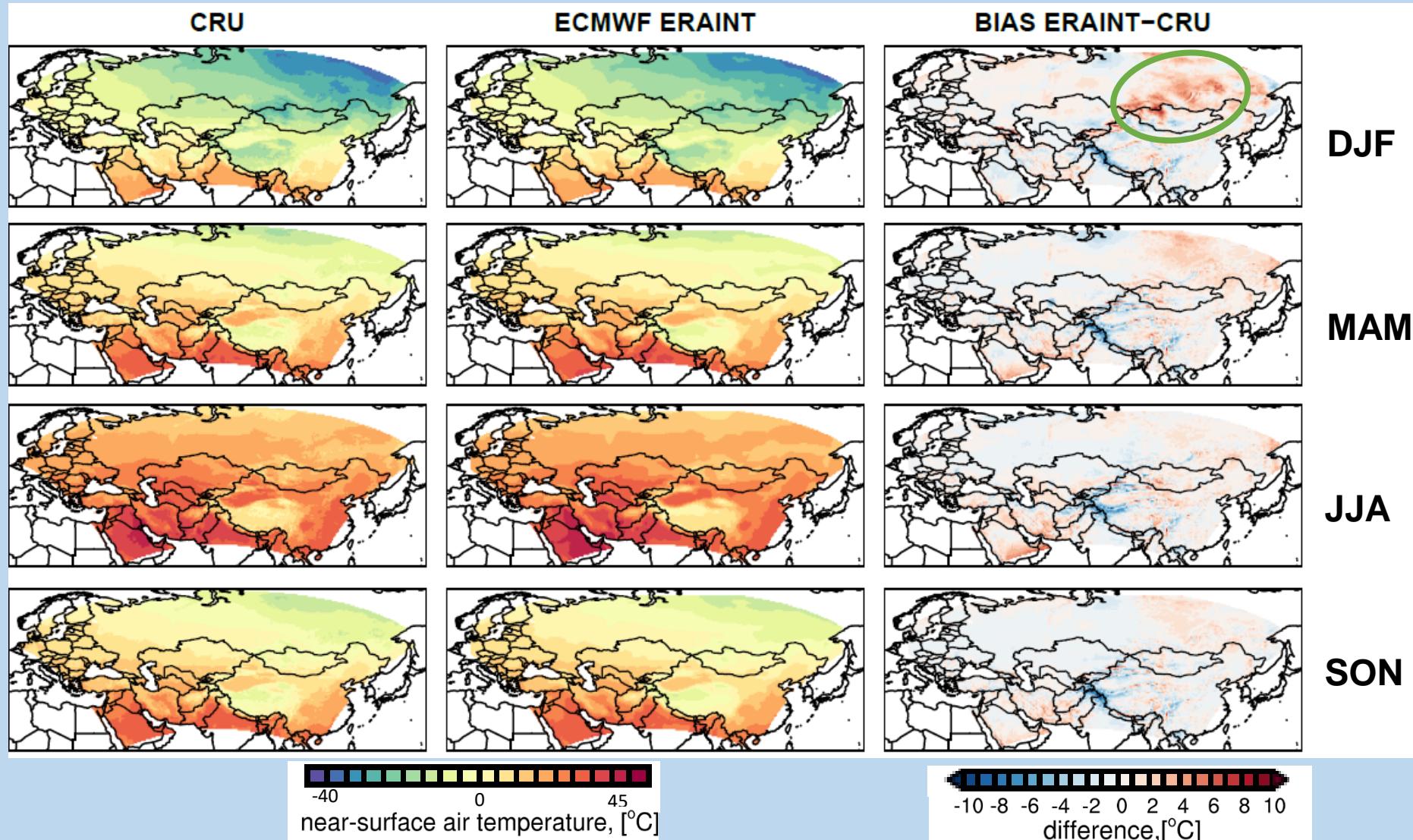


# VALIDATION: mean temperature

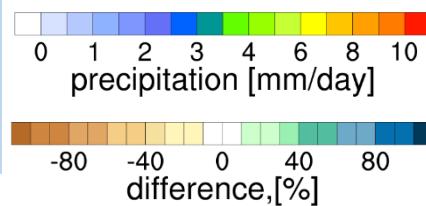


# VALIDATION: mean temperature

## Explanation bias

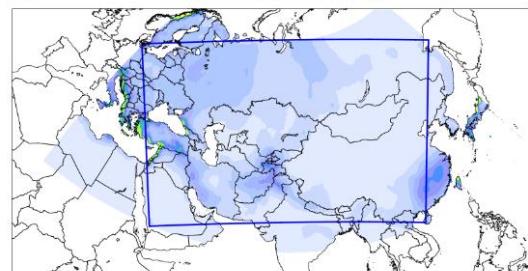


# VALIDATION: precipitation

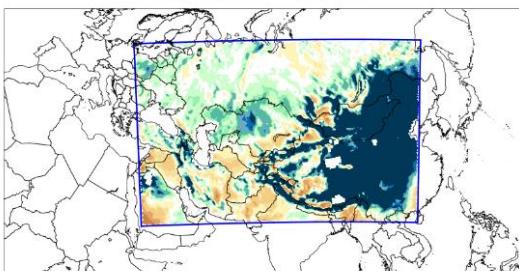


DJF

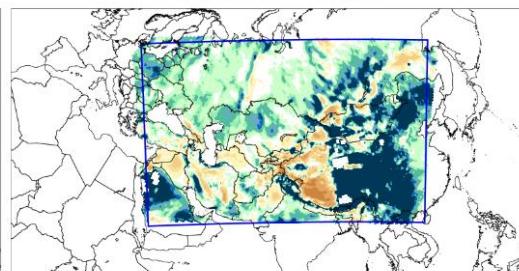
**CRU:1980-2017**



**REMO - CRU**

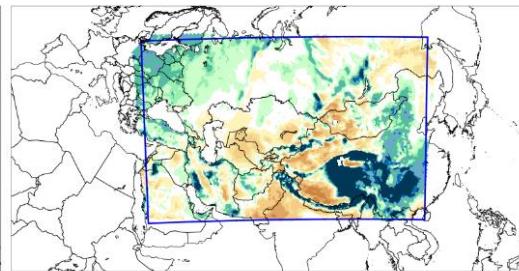
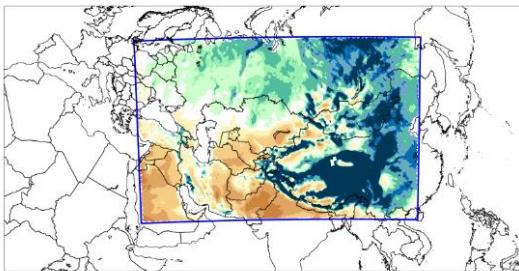
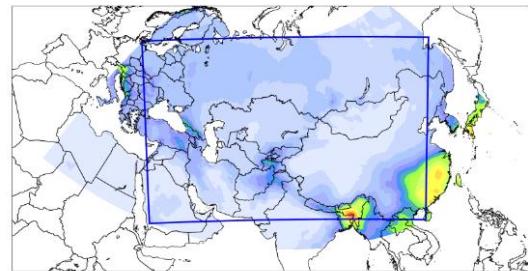


**ALARO - CRU**



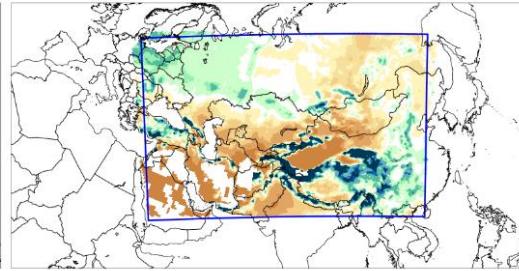
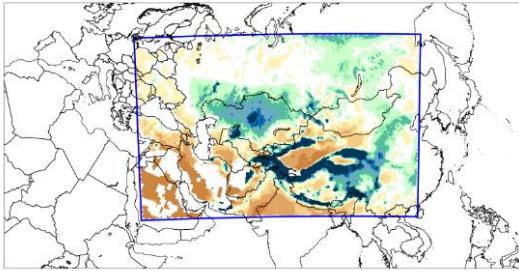
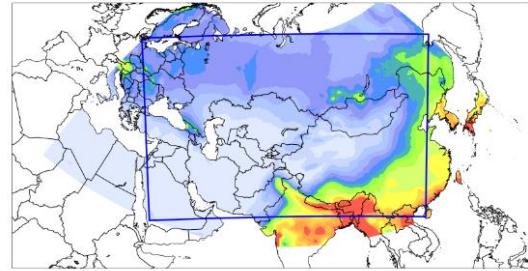
**DJF**

MAM



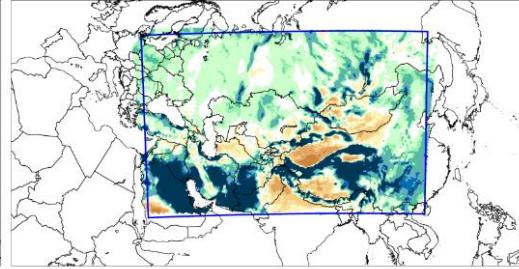
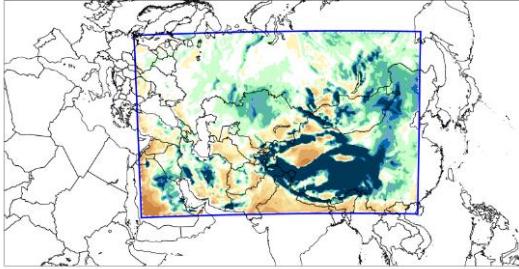
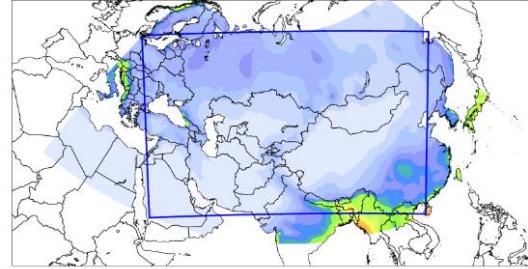
**MAM**

JJA



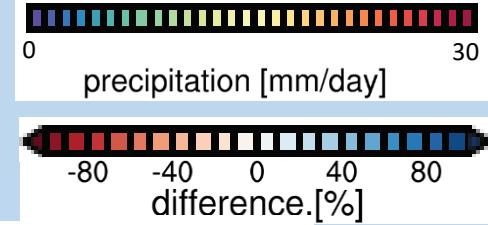
**JJA**

SON

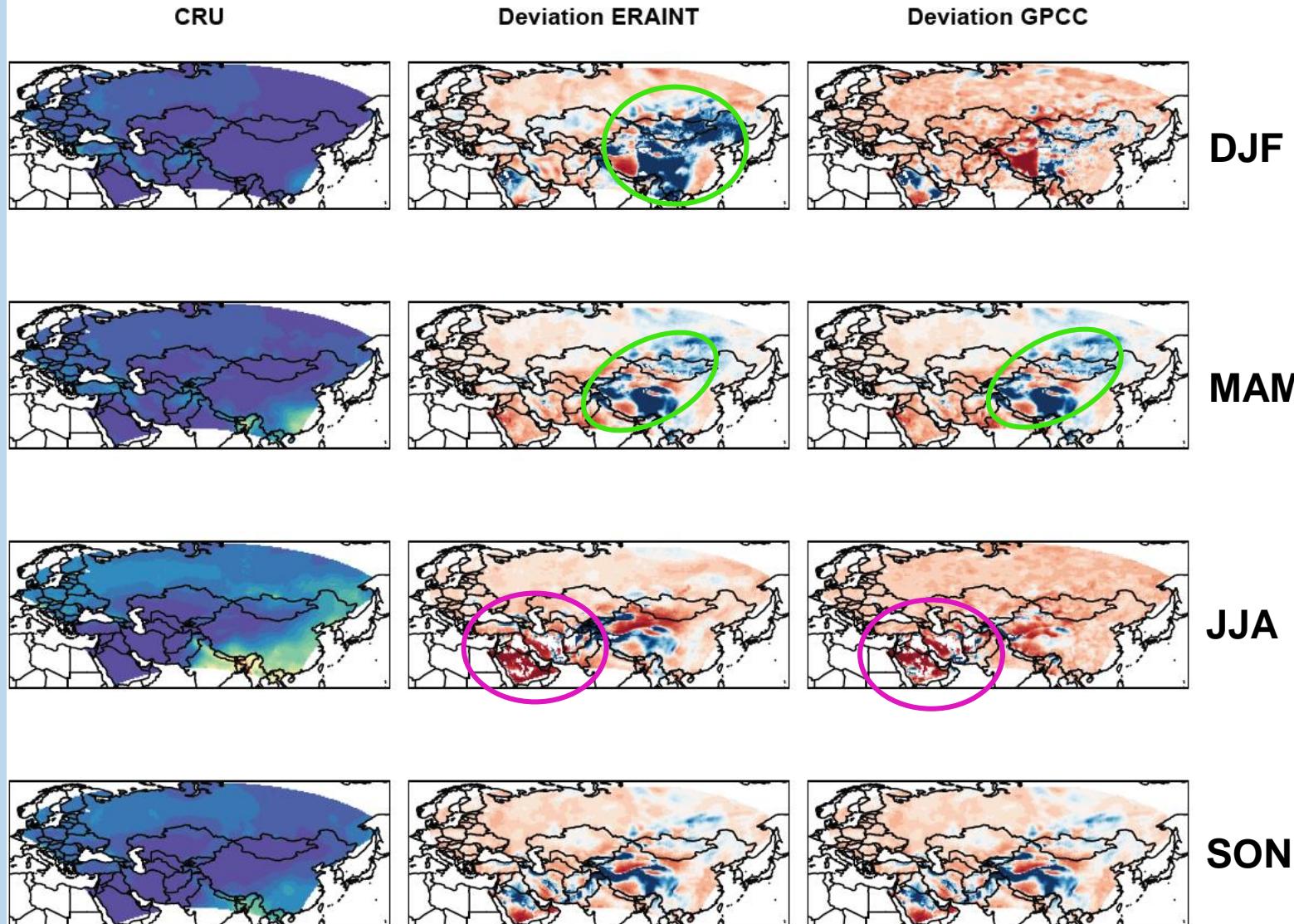


**SON**

# VALIDATION: precipitation



## Explanation bias



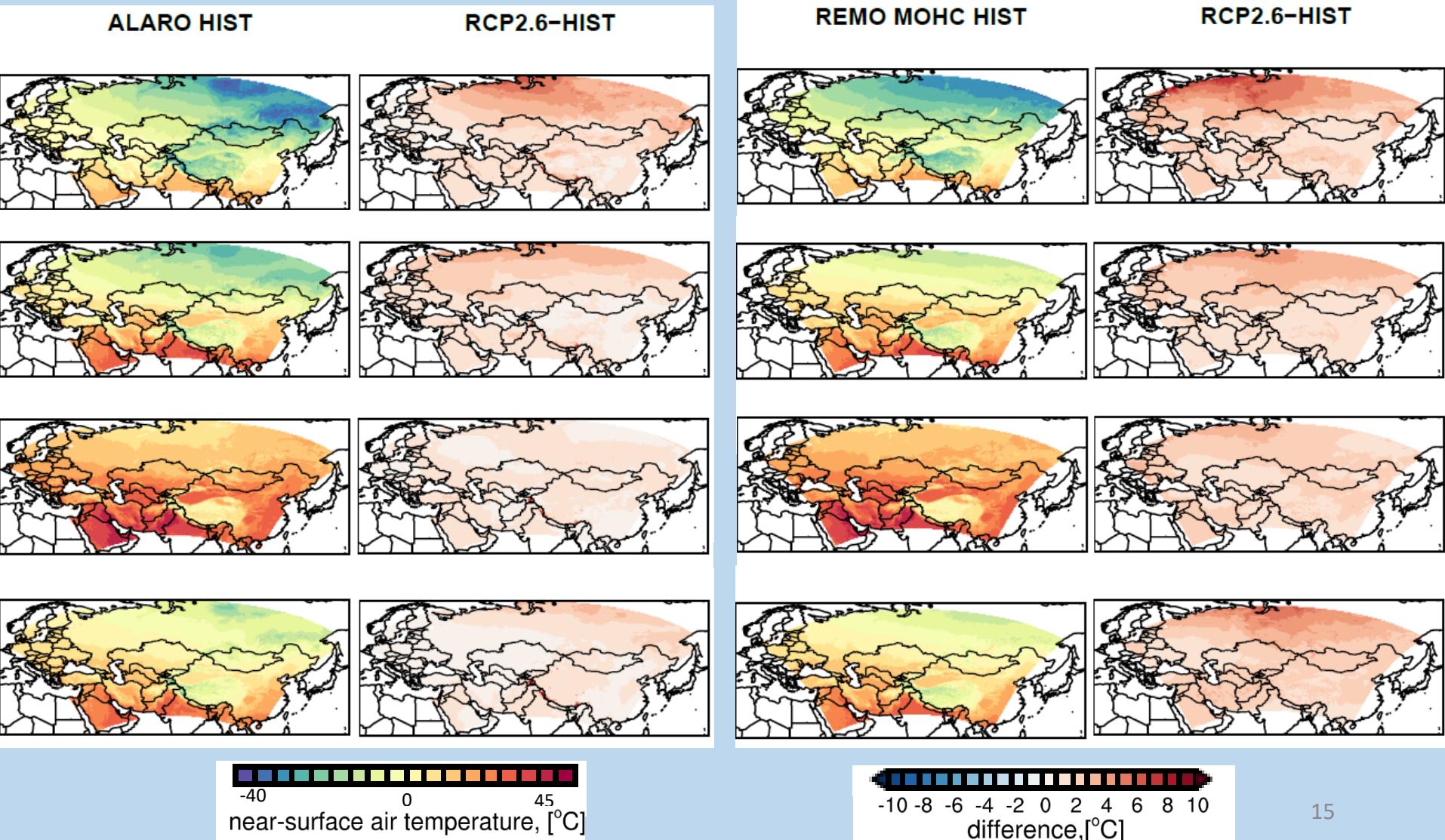
# PROJECTIONS

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

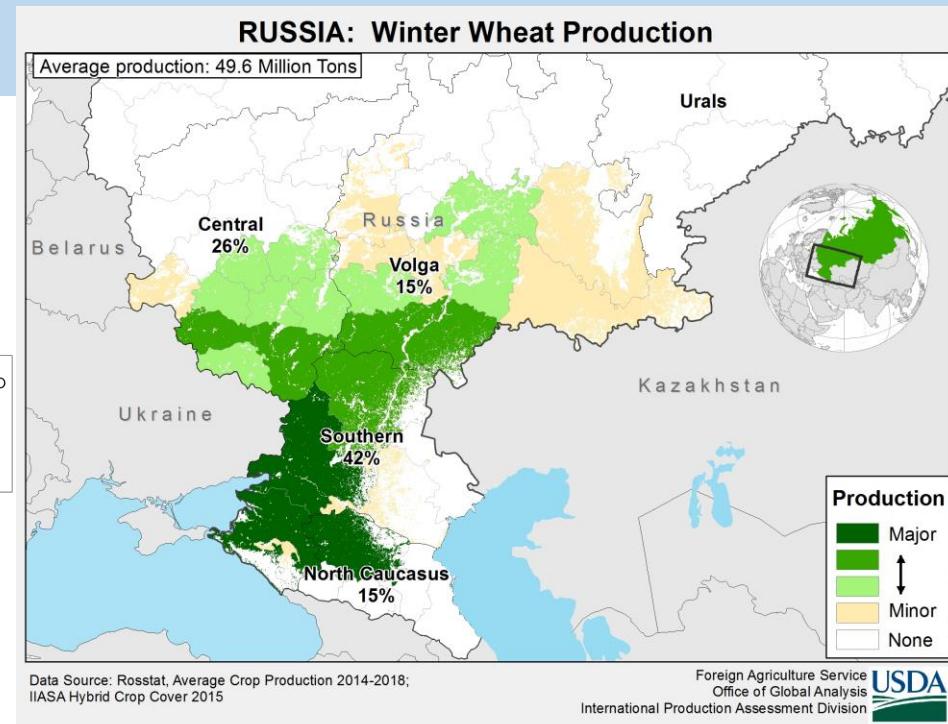
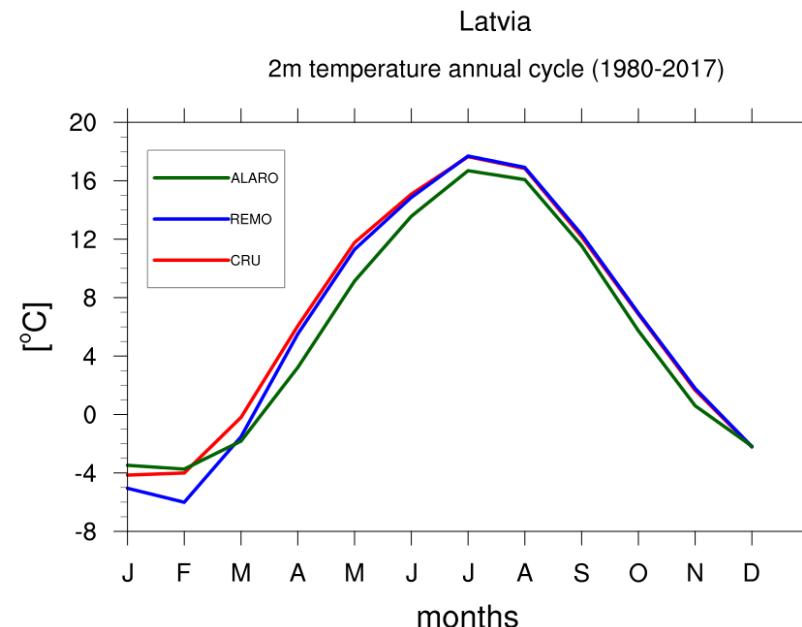
RCP 2.6 for 1971 - 2099 compared to historical run



# SUBREGIONS

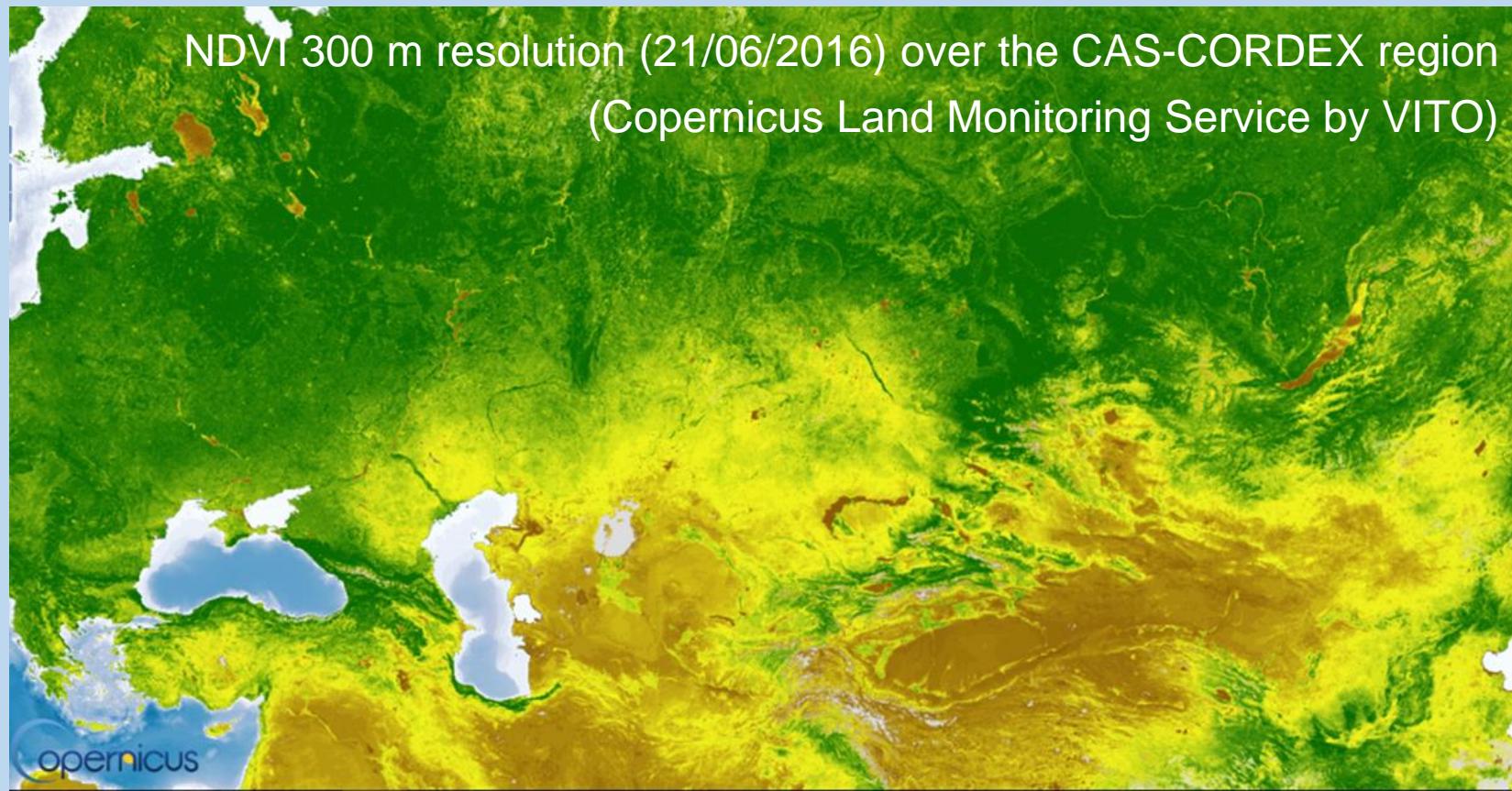
Similar approach, but more detailed information

- Russia → focus on crop regions
- Latvia
- Turkey



# NEXT STEPS

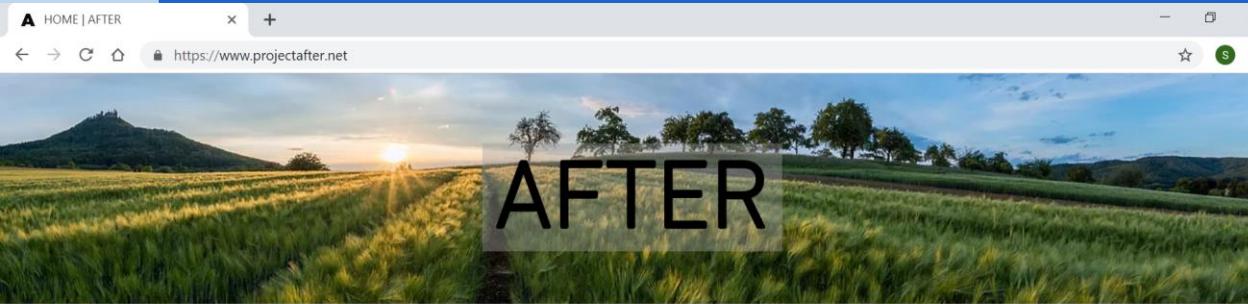
- Use climate data as forcing in impact models
- Study future evolution of agriculture and forestry
- Dissimilation stakeholders





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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](https://www.projectafter.net)  
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[after.newsletter@gmail.com](mailto:after.newsletter@gmail.com)



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