

Economic and Social Commission for Western Asia

# Overview on Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR)

Improved Groundwater Management in the Arab Region through Enhanced Data and Information Access  
and Innovative technologies  
Cairo, 30-31 October 2023



UNITED NATIONS

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ESCWA

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# RICCAR Objective and Purpose

**Objective:** To assess the impact of climate change on freshwater resources in the Arab Region through a consultative regional initiative that scientifically identifies the socio-economic and environmental vulnerability caused by climate change impacts on water resources based on regional specificities.

**Purpose:** To provide a common platform for assessing, addressing and informing response to climate change impacts on freshwater resources in the Arab region by serving as the basis for dialogue, priority setting and policy formulation on climate change at the regional level.

Assessment

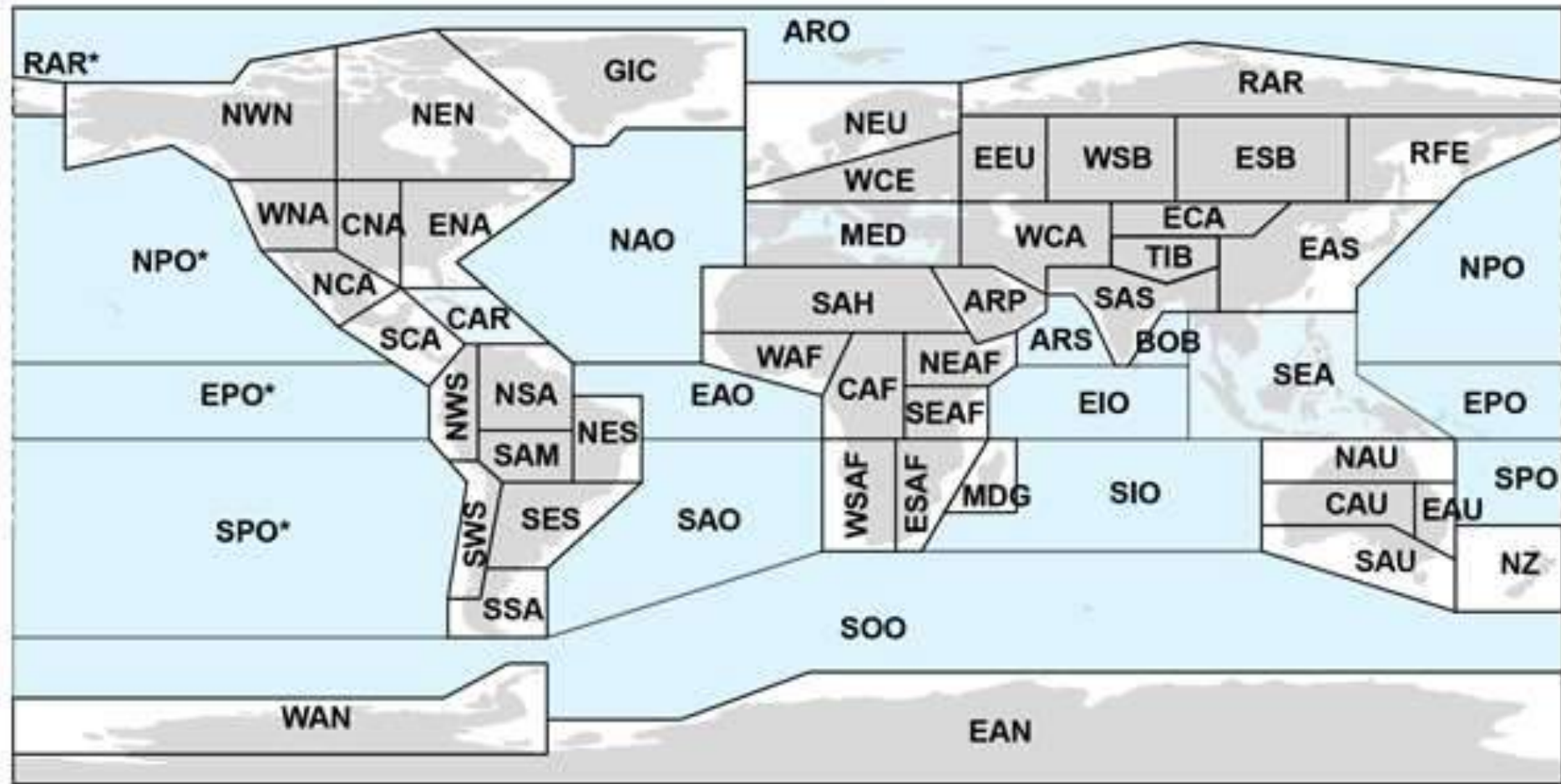
Adaptation

Mitigation

Negotiations

# IPCC Regional Analysis

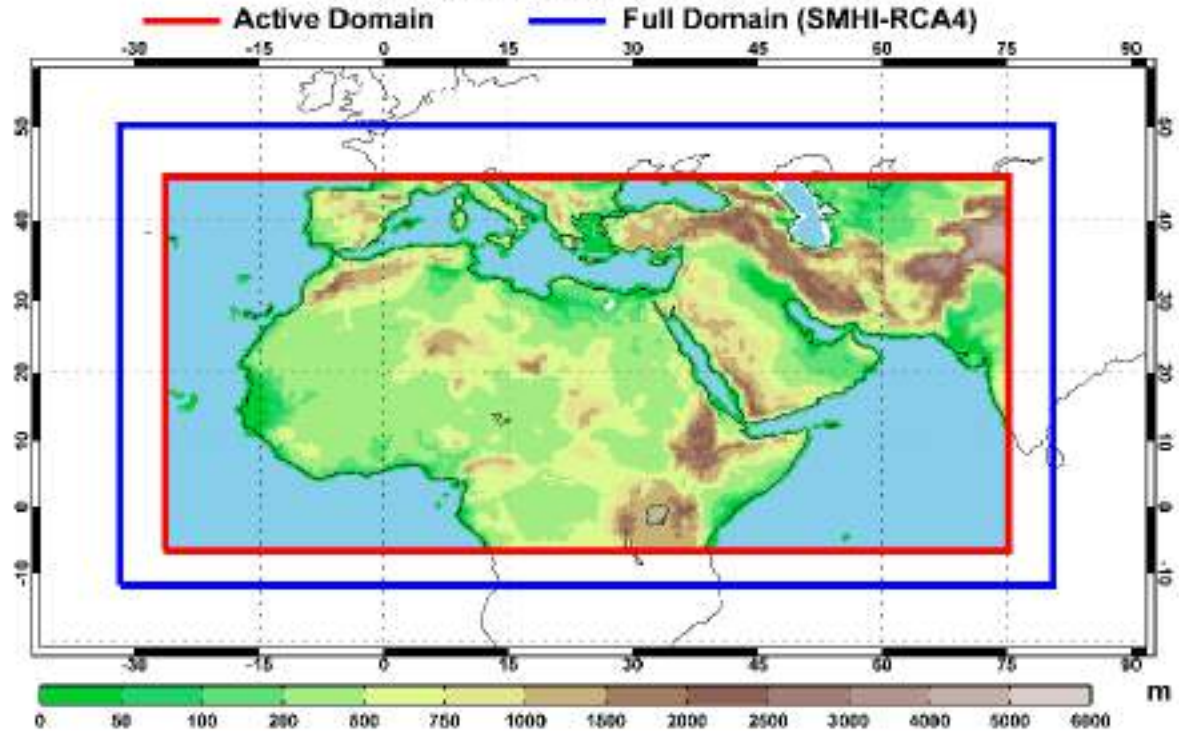
Arab/MENA region,  
Mashreq and Maghreb  
are not represented as  
regions in IPCC reports



IPCC regional outcomes available  
from: <https://interactive-atlas.ipcc.ch/>

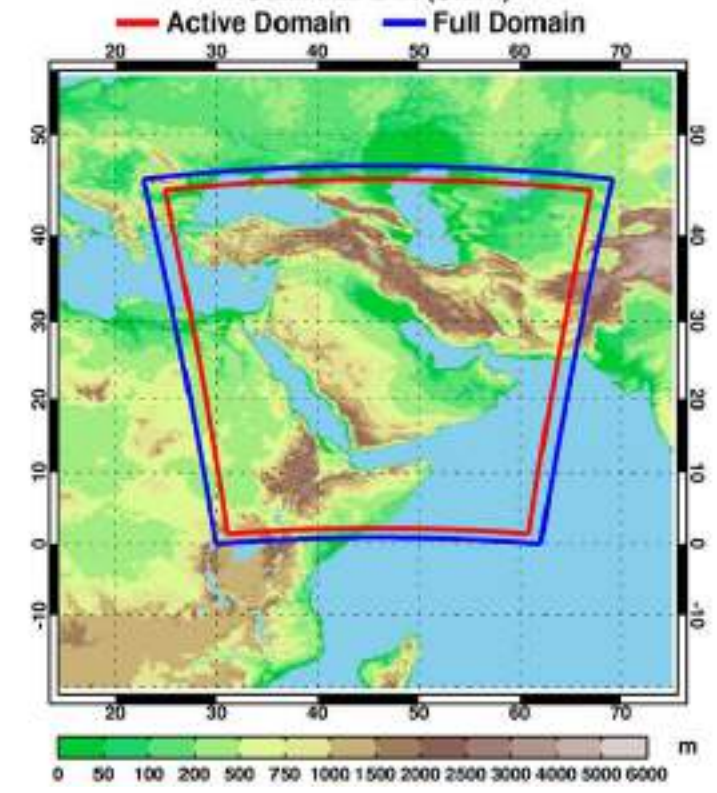
# RICCAR Regional Domains

CORDEX-MENA/Arab Domain | 0.44° (50 km)



- CMIP5 Models
- RCP Scenarios (RCP4.5 and RCP8.5)
- 50 km resolution
- Bias-adjusted outputs
- Domain vetted by the WCRP Coordinated Regional Climate Downscaling Experiment (CORDEX)
- Time period: 1986-2100

RICCAR Mashreq Domain | 10km | MSH-10  
HCLIM-ALADIN (SMHI)



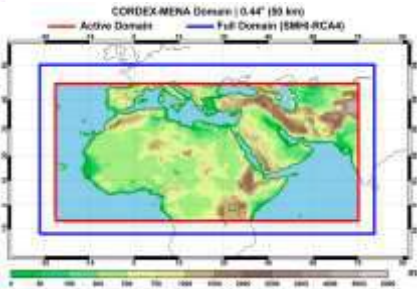
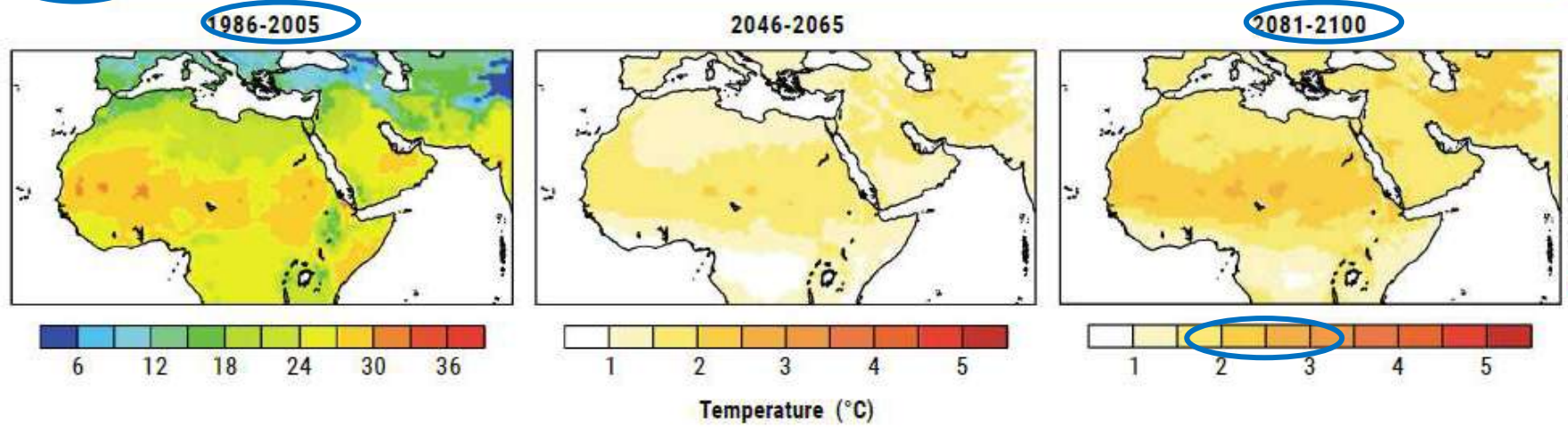
- CMIP6 Models
- SSP Scenarios (SSP2-4.5\* and SSP5-8.5)
- 10 km resolution
- Bias-adjusted output
- Time period: 1995-2060



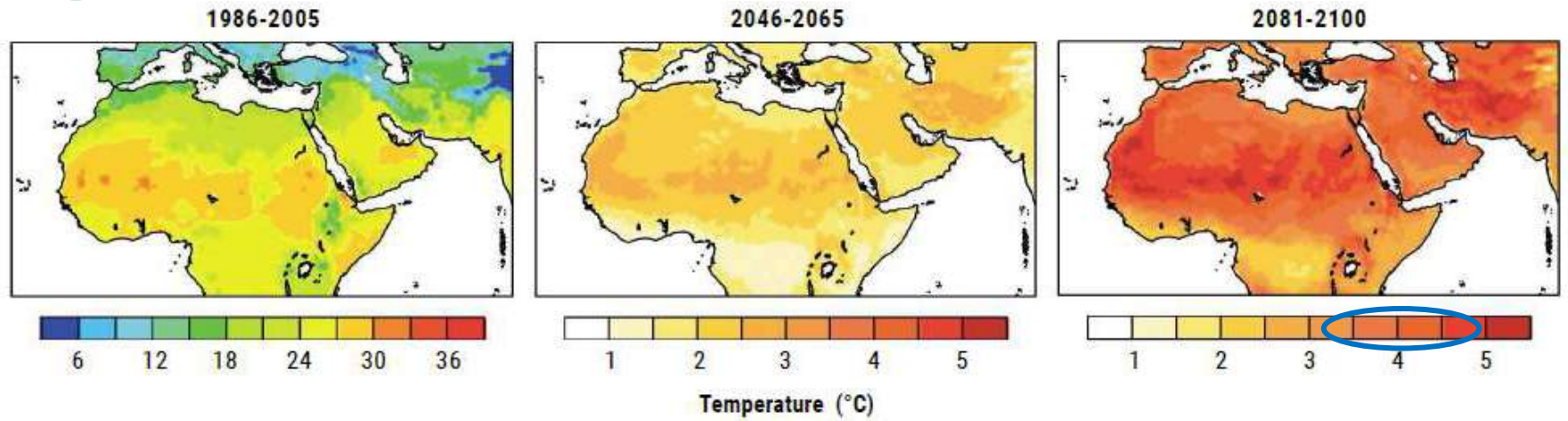
# Mean Temperature Projected to Increase

Moderate Climate Scenario

## RCP 4.5



## RCP 8.5



Source: [www.riccar.org](http://www.riccar.org)

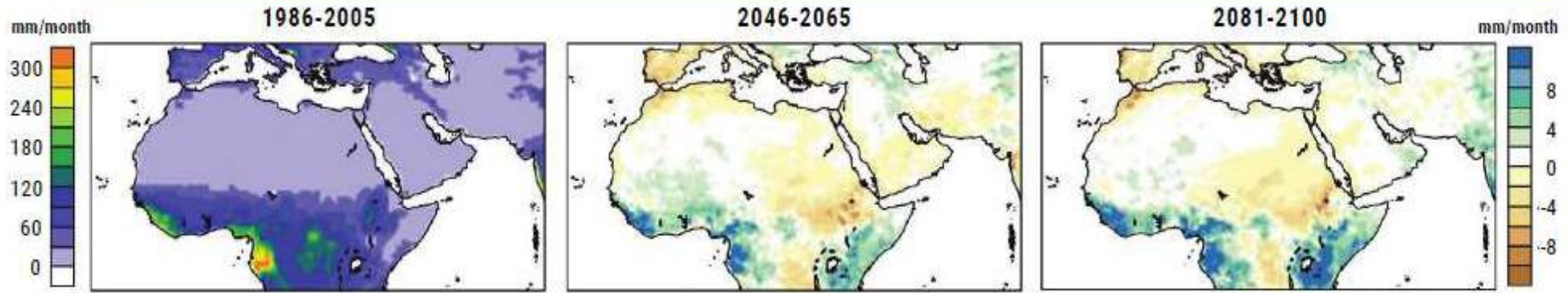
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# Precipitation Projected to be more Variable

*Precipitation trends are largely decreasing across the region, though limited areas expected to exhibit an increase in the intensity and volume of precipitation*

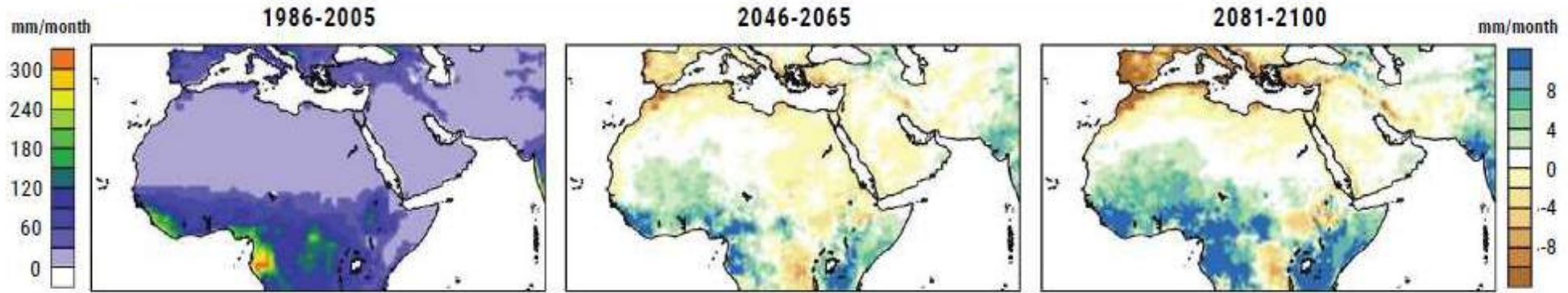
## RCP 4.5

Moderate Climate Scenario



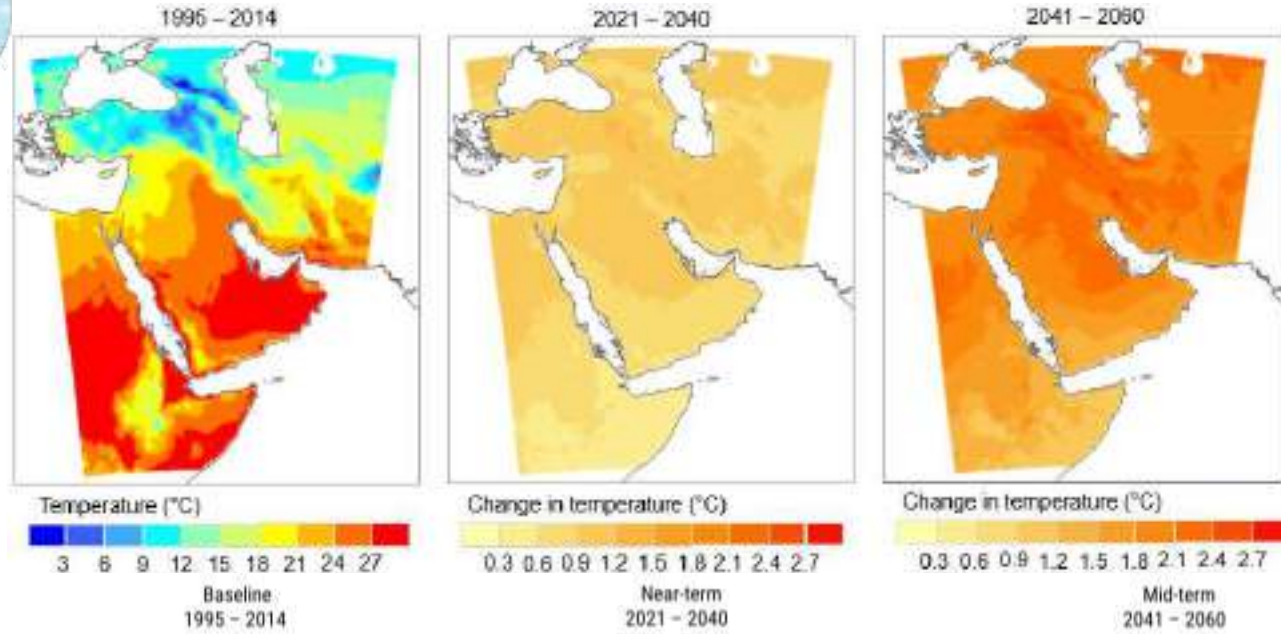
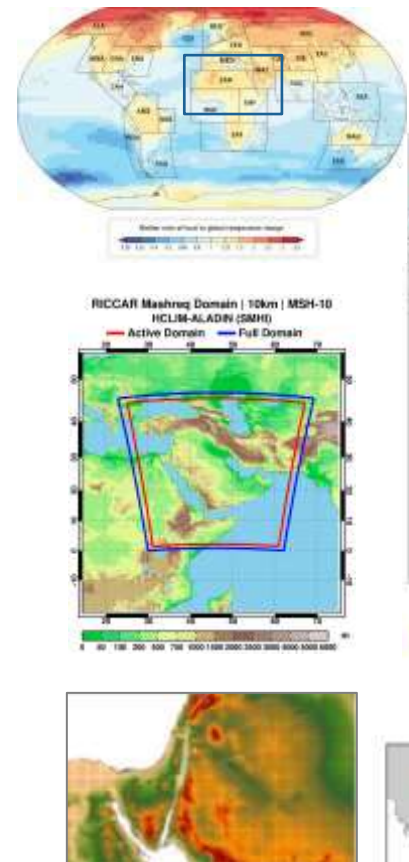
## RCP 8.5

Business-as-Usual Climate Scenario



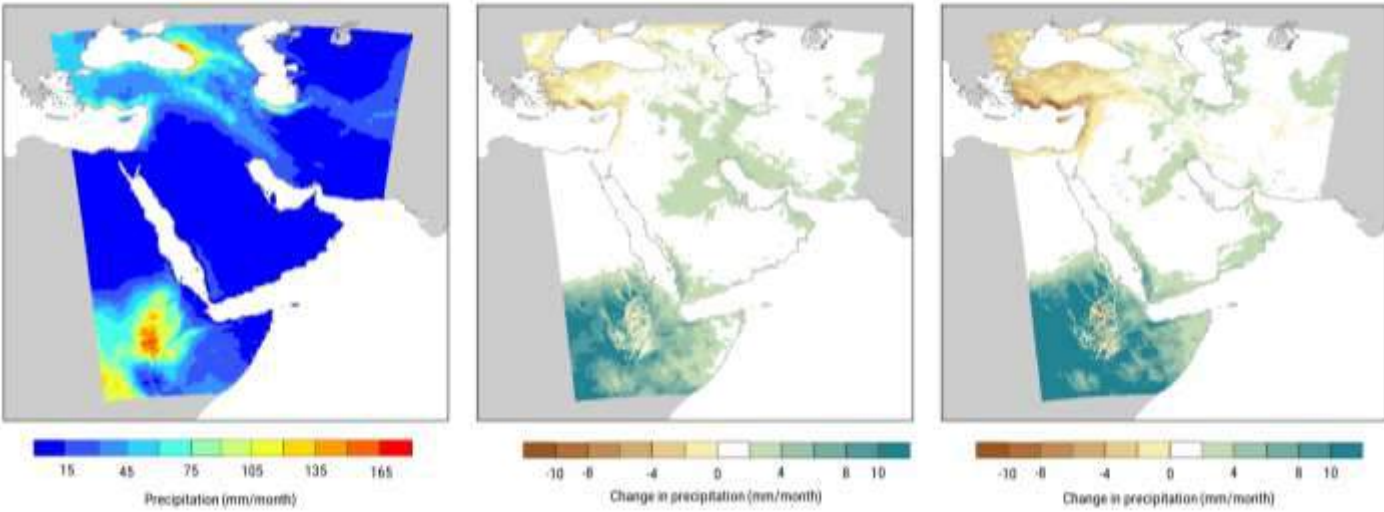


*From CMIP5 across the CORDEX-MENA/Arab Domain to support regional cooperation . . .  
 . . . To CMIP6 within the Mashreq Domain to facilitate more detailed analyses to inform regional action*



By mid-term, Mashreq Domain is increasing as much as 2.7 °C (mean increase 1.8 °C), higher than the global mean (1.7 °C)

Increasing temperature will give rise to extreme events, including heat waves, and impact water availability, agricultural productivity, biodiversity and vulnerable populations.



Although overall precipitation volume exhibits little projected change, increased interannual and seasonal variability is expected

## Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

### KNOWLEDGE RESOURCES

The central aim of this Regional Knowledge Hub is to provide access to information that can facilitate cooperation, coordination, dialogue and exchange among Arab States, organizations

### DATA PORTAL

The data portal allows interactive visualization of RICCAR maps and provides access to RICCAR data repository.



### KNOWLEDGE NODES

Innovation of National, Regional and International Nodes for the Transfer and Sharing of Knowledge

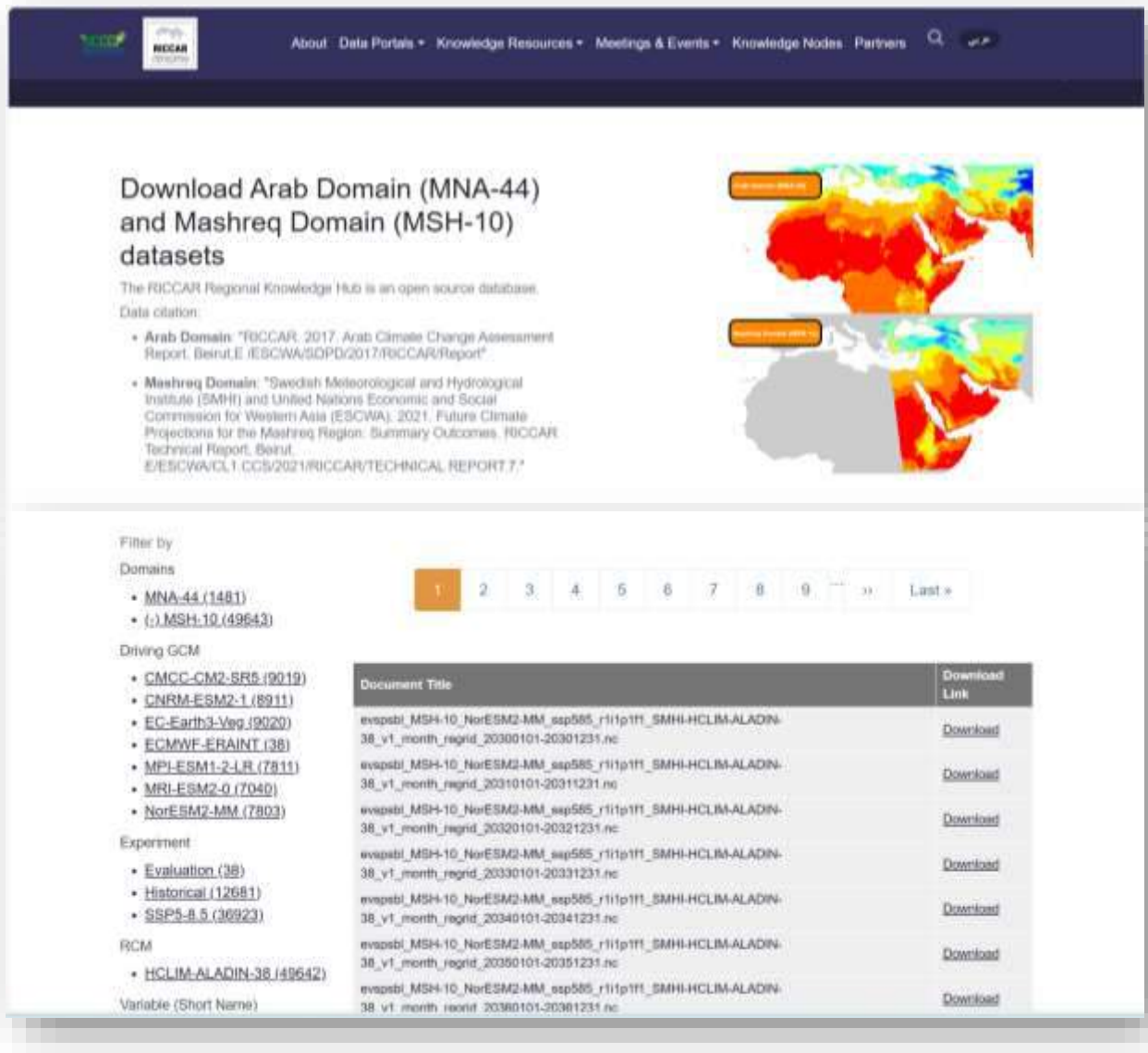
### PARTNERSHIPS

Strategic partnerships for supporting strategic objectives to implement climate change adaptation and mitigation programs at the national and regional levels.

[Request Data](#)



# Download RICCAR Climate Datasets



**Download Arab Domain (MNA-44) and Mashreq Domain (MSH-10) datasets**

The RICCAR Regional Knowledge Hub is an open source database.

Data citation:

- Arab Domain:** "RICCAR, 2017, Arab Climate Change Assessment Report, Beirut, I/ESCWA/SOPD/2017/RICCAR/Report"
- Mashreq Domain:** "Swedish Meteorological and Hydrological Institute (SMHI) and United Nations Economic and Social Commission for Western Asia (ESCWA), 2021, Future Climate Projections for the Mashreq Region: Summary Outcomes, RICCAR Technical Report, Beirut, I/ESCWA/CL1.CCS/2021/RICCAR/TECHNICAL REPORT 7"

Filter by

Domains

- MNA-44 (1481)
- (-) MSH-10 (49643)

Driving GCM

- CMCC-CM2-SR5 (9019)
- CNRM-ESM2-1 (8911)
- EC-Earth3-Veg (9020)
- ECMWF-ERAINT (38)
- MI-ESM1-2-LR (7811)
- MRI-ESM2-0 (7040)
- NorESM2-MM (7803)

Experiment

- Evaluation (38)
- Historical (12681)
- SSP5-R5 (36923)

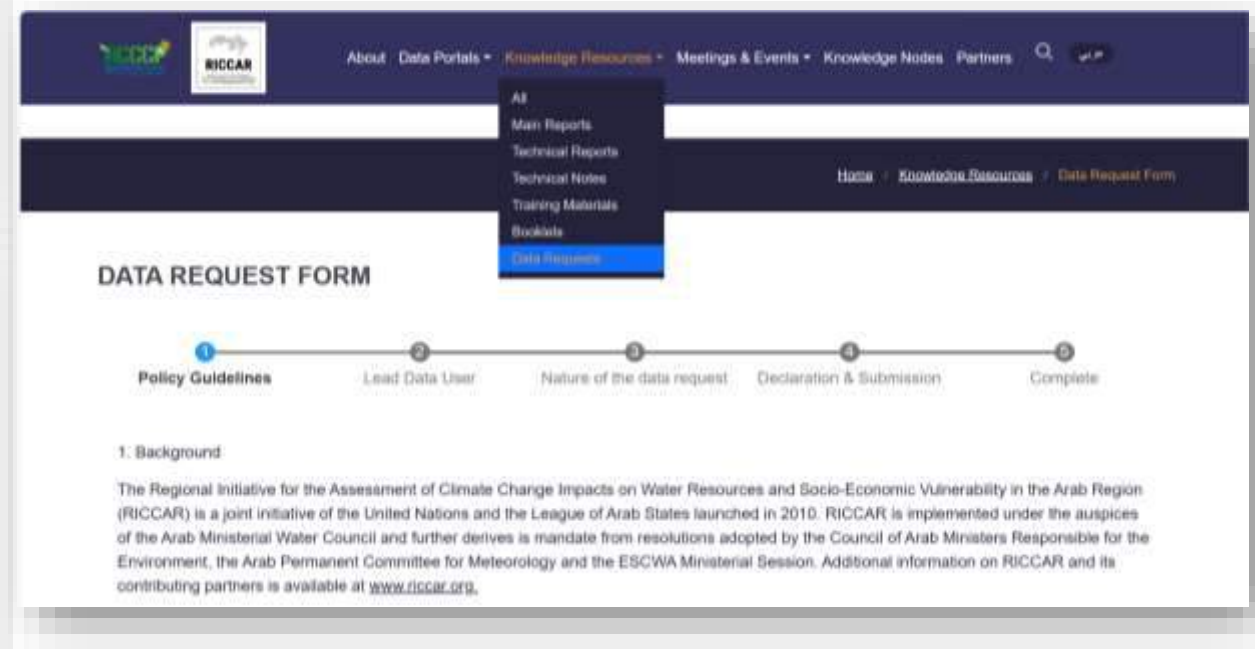
RCM

- HCLIM-ALADIN-38 (49642)

Variable (Short Name)

Document Title	Download Link
evapsbl_MSH-10_NorESM2-MM_ssp585_r11p1f1_SMHI-HCLIM-ALADIN-38_v1_month_regrid_20300101-20301231.nc	<a href="#">Download</a>
evapsbl_MSH-10_NorESM2-MM_ssp585_r11p1f1_SMHI-HCLIM-ALADIN-38_v1_month_regrid_20310101-20311231.nc	<a href="#">Download</a>
evapsbl_MSH-10_NorESM2-MM_ssp585_r11p1f1_SMHI-HCLIM-ALADIN-38_v1_month_regrid_20320101-20321231.nc	<a href="#">Download</a>
evapsbl_MSH-10_NorESM2-MM_ssp585_r11p1f1_SMHI-HCLIM-ALADIN-38_v1_month_regrid_20330101-20331231.nc	<a href="#">Download</a>
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evapsbl_MSH-10_NorESM2-MM_ssp585_r11p1f1_SMHI-HCLIM-ALADIN-38_v1_month_regrid_20360101-20361231.nc	<a href="#">Download</a>

- Data is available via open-source
- Data in netCDF format (typical of climate datasets)
- Can also send request for tailored datasets in multiple formats:



**DATA REQUEST FORM**

Home - Knowledge Resources - Data Request Form

Navigation: All, Main Reports, Technical Reports, Technical Notes, Training Materials, Booklets, **Data Requests**

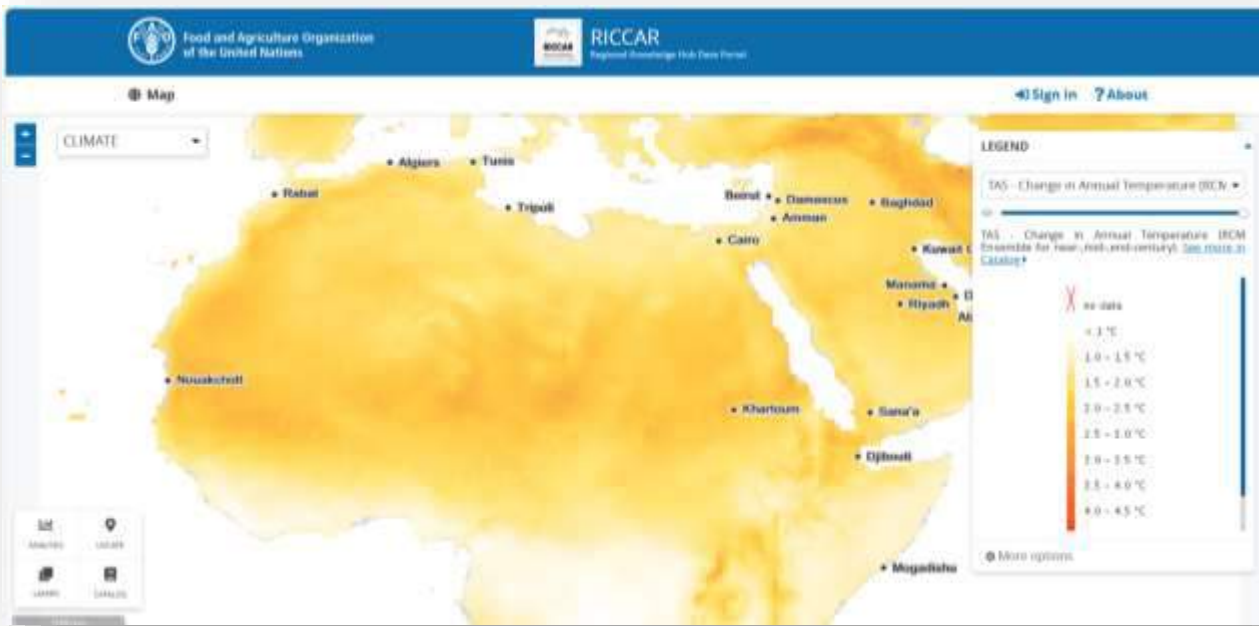
Progress Bar:

- 1 Policy Guidelines
- 2 Lead Data User
- 3 Nature of the data request
- 4 Declaration & Submission
- 5 Complete

**1. Background**

The Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR) is a joint initiative of the United Nations and the League of Arab States launched in 2010. RICCAR is implemented under the auspices of the Arab Ministerial Water Council and further derives its mandate from resolutions adopted by the Council of Arab Ministers Responsible for the Environment, the Arab Permanent Committee for Meteorology and the ESCWA Ministerial Session. Additional information on RICCAR and its contributing partners is available at [www.riccar.org](http://www.riccar.org).

# RICCAR RKH Data Portals



- Arab Domain ensembles from regional climate modelling and regional hydrological modelling
- Open-source interactive usage and can download data



- Mashreq Domain ensembles based on raw and bias-adjusted regional climate modelling outputs
- Open-source interactive usage and can download data