

RICCAR Regional Knowledge Hub and Data Portal: Accessing global and regional datasets, analysis and training tools

Building Capacity for Accessing Disruptive Technologies for Improved Water Resources Management under Climate Change
Beirut, 14-15 January 2020



UNITED NATIONS

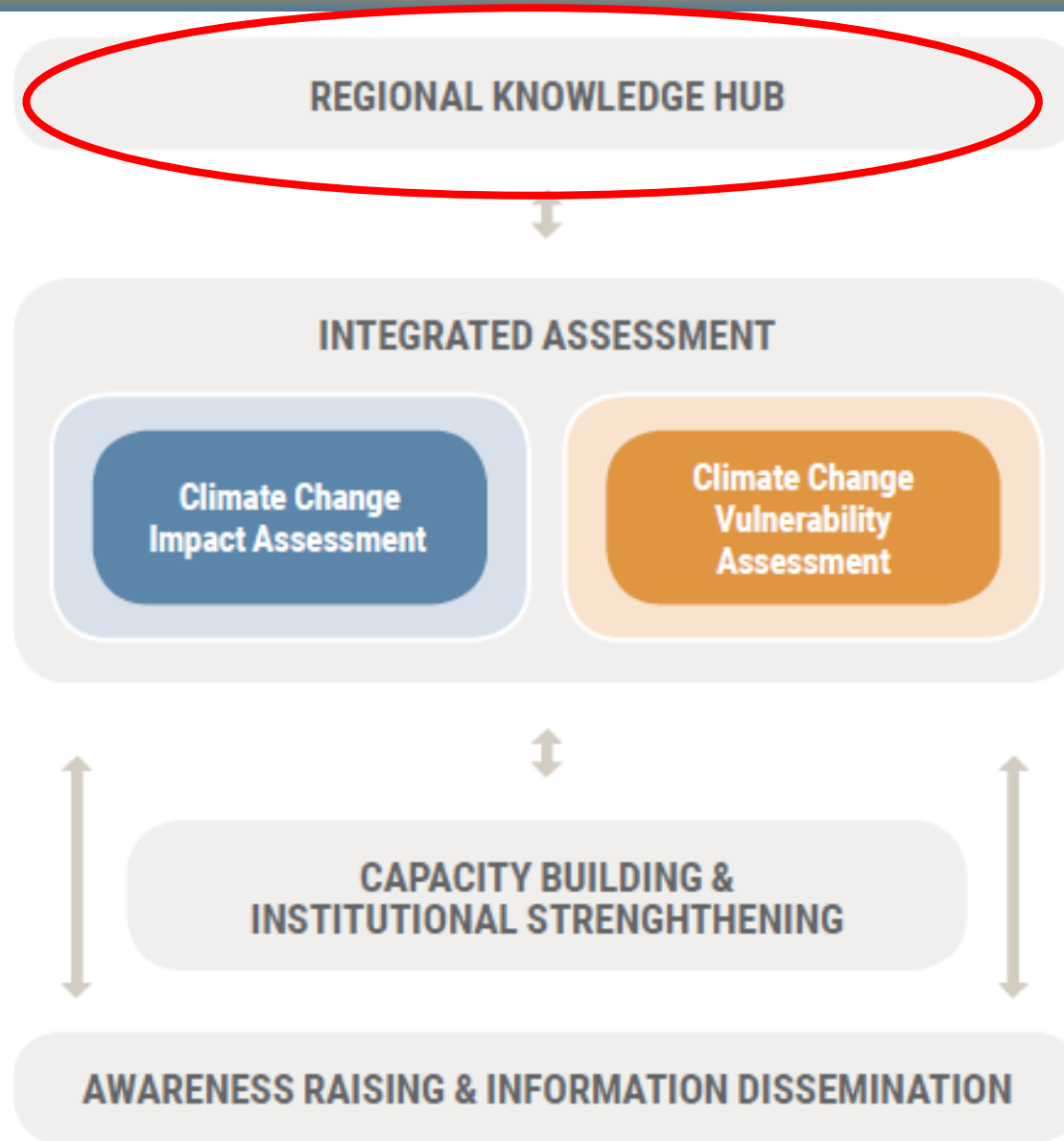
الأمم المتحدة
ESCWA

Shared Prosperity **Dignified Life**



Marlene Tomaszekwicz
Regional Advisor for GIS for Climate Change Analysis
UN-ESCWA

RICCAR Pillars of Work: Regional Knowledge Hub (RKH)



RKH Objectives

Main objective: **to provide an interactive, online platform that provides easy access to information and analysis on knowledge products related to climate change and water resources in the Arab Region and contributing water basins**

Ultimately:



To provide **access to information** that can facilitate cooperation, coordination, dialogue and exchange among Arab and neighboring countries

To support **awareness raising** for national and local stakeholders as well as **capacity building support**

Who can benefit from the RKH ?

- ⇒ *Ministries managing water and climate-related portfolios*
- ⇒ *Meteorological services*
- ⇒ *Researchers and academic institutions*
- ⇒ *Non-governmental and civil society organizations*

INTERNATIONAL JOURNAL OF CLIMATE
Int. J. Climatol. **36**: 236–251 (2016)
Published online 16 April 2015 in Wiley
(wileyonlinelibrary.com) DOI: 10.1002/joc.3982

RegCM4 in climate model domain: selection of the best performing model

Center of Excellence for Climate Change Research

ABSTRACT: In order to find out the best performing model among the 12 (CMIP5) database, this study of the Regional Climate Model version 4 (RegCM4) compliance with COordinated Regional Downscaling Scheme (CORDEX) assessed through seven simulation experiments to find better performing convective parameterization schemes. Experiments are conducted using other reanalysis datasets. Results are also downscaled to assess the mean square difference and standard deviation. The results show that the Climatic Research Unit (CRU) atmospheric temperature show better spatial distribution. The results may be considered as an added value for the CORDEX-MENA/Arab domain.



Climate Food Network

By Rabi Mohtar

Summary

Understanding the impact of climate change on the developing effective strategies for growing global population is essential. Each of the water, energy, and food systems. Climate change is all about temperature has warmed by 1°C per decade in the last century. Climate change and other implications for human health and the environment.

Theor Appl Climatol (2016) 124:807–823
DOI 10.1007/s00704-015-1463-5

ORIGINAL PAPER

Best convective parameterization scheme to downscale CMIP5 for the CORDEX-MENA/Arab domain

Mansour Almazroui¹ · Md. Nazrul Islam²

Received: 5 February 2015 / Accepted: 7 April 2015
© The Author(s) 2015. This article is published online first.

Abstract A suitable convective parameterization scheme within Regional Climate Model version 4 (RegCM4) developed by the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, is investigated in sensitivity runs for the period 2000–2050 with European Centre for Medium-Range Weather Forecasts (ECMWF) ERA-Interim 6-hourly boundary conditions for the CORDEX-MENA/Arab domain. The results show that the Interim lateral boundary conditions from the Climatic Research Unit (CRU) data is also used. The performance of RegCM4. Different statistical methods are taken into consideration in assessing model performance. The (4) sub-domains throughout the analysis are selected of interest. There is no common best option for both rainfall and temperature (with low bias and high variance) among the 12 options investigated.



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Themed Section : Engineering and Technology

Monitoring the Changes of Temperature Indices Under Climate Change Conditions

Khalil A.A.

Central Laboratory for Agricultural Climate (CLAC), Agricultural Research Center (ARC), Egypt

ABSTRACT

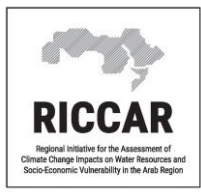
Weather and climate temperature extreme events may have major impacts on society, economy, ecosystems, and on human health; they drive natural and human systems much more than the average climate. The aim of this study is to monitor and analyze the changes of temperature indices based on future climate data in Egypt. The monitoring has been done based on assessing the changes of four temperature indices (Maximum maximum temperature (TXx), Minimum minimum temperature (TNn), Frost days(FD) and summer days(SU)) according to future climate data. The climate change data has obtained from downscaling global climate model ECHAM6 of scenario RCP 4.5 by a horizontal resolution 50 km during the period from 2010 up to 2090, and the results indicated that the highest TXx observed during the period 2080-2089 while lowest TNn observed during the period 2010-2019 in the most of Egypt governorates. Also, it has been observed that the maximum number of frost days was observed in 2010 decade while the maximum number of summer days in winter season was observed in 2080 decade at most of Egypt governorates.

Keywords: Maximum and Minimum Temperatures, Temperature Indices and Climate Change.

I. INTRODUCTION

Extreme weather events can have severe impacts on human health, built infrastructure, the natural environment, the transport sector and the economy at large. Extreme events in recent years have drawn increased attention to the science seeking to understand their causes (Kerr 2013). The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (Stocker *et al.* 2014) concluded that strong evidence

exists for climate impacts. During the last few years, the need for information more directly linked to impacts has resulted in a wide range of climate indices. Climate indices have developed to a simplified way to communicate more complex climate change impact relations. Most studies of climate extremes are limited to the last ~ 50 years or less, simply because longer-term daily datasets have not commonly digitized. Furthermore, where long-term data are available, uncertainties about their homogeneity limit their use in



RICCAR Website

HOME RICCAR OVERVIEW KNOWLEDGE RESOURCES MEETINGS & EVENTS KNOWLEDGE NODES PARTNERS CONTACT US  عربي



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



ريكار
المبادرة الإقليمية لتقييم أثر تغير المناخ على
الموارد المائية ومخاطر تأثر القطاعات المجتمعية
والاقتصاد في المنطقة العربية

Welcome to the
RICCAR REGIONAL KNOWLEDGE HUB

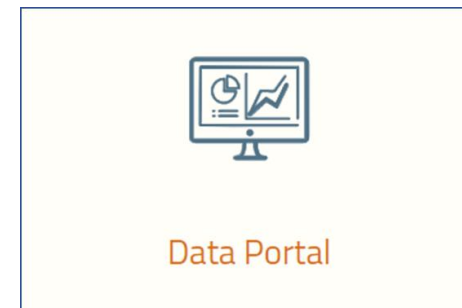
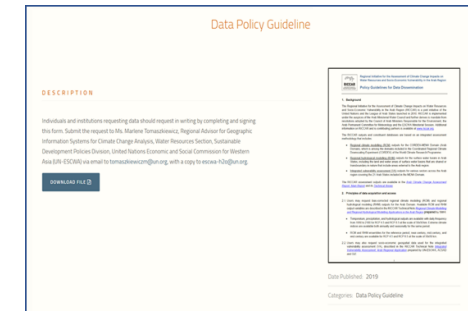
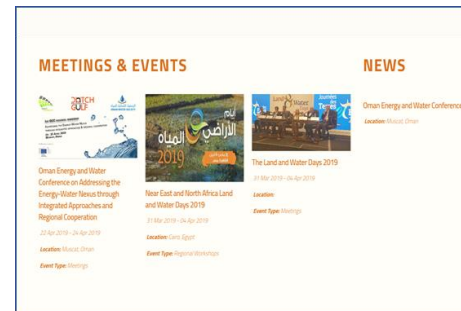
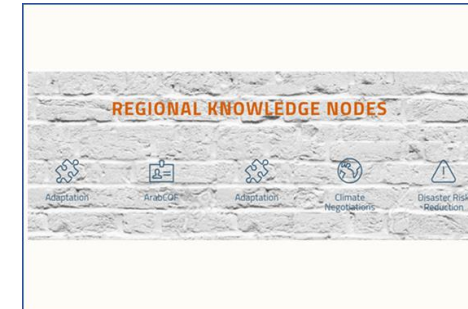
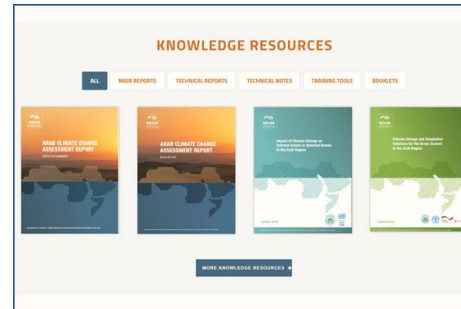
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REGIONAL INITIATIVE FOR THE ASSESSMENT OF CLIMATE CHANGE IMPACTS ON WATER RESOURCES AND SOCIO-ECONOMIC VULNERABILITY IN THE ARAB REGION

www.riccar.org

WEBSITE

- Access to all RICCAR reports and related knowledge resources
- Hosts climate-related regional knowledge nodes
- Informs on training tools, activities and events
- Offers assistance tools for submitting inquiries and requests for support
- Direct access to the data portal



RICCAR Knowledge Resources



ARAB CLIMATE CHANGE ASSESSMENT REPORT



TECHNICAL NOTES





→ **Adaptation**

ADAPTATION POLICIES

CLIMATE MAINSTREAMING


TRAINING MANUALS

CASE STUDIES AND INNOVATIONS

WATER-ENERGY-FOOD SECURITY NEXUS




Arab Climate Outlook Forum (COF)



ArabCOF-2 Statement
2018

Consensual seasonal forecast for MAM 2018 season over Arab countries is based on known teleconnections of large and regional patterns as well as on dynamical and statistical models.


[READ MORE](#) [DOWNLOAD FILE](#)



ArabCOF 1 Statement
2017

This seasonal forecast is based on different dynamical models outputs from various global climate prediction centers, statistical models and known Teleconnection with climate pattern.

[READ MORE](#) [DOWNLOAD FILE](#)



The Second Arab Climate Outlook Forum Meeting (ArabCOF2)
13-14 February 2018
Location: Cairo, Egypt

[READ MORE](#)



Climate Negotiations

Tenth Regional Training Workshop on Capacity Development for Climate Change Negotiations for the Arab Countries

Date: 3-5 April 2018

Location: Kuwait City, Kuwait

[VIEW](#)

Ninth Regional Training Workshop on Capacity Development for Climate Change Negotiations for the Arab Countries

Date: 9-12 September 2017

Location: Cairo, Egypt

[VIEW](#)

Eighth Regional Training Workshop on Capacity Development for Climate Change Negotiations for the Arab Countries

Date: 10-13 April 2017

Location: Beirut, Lebanon

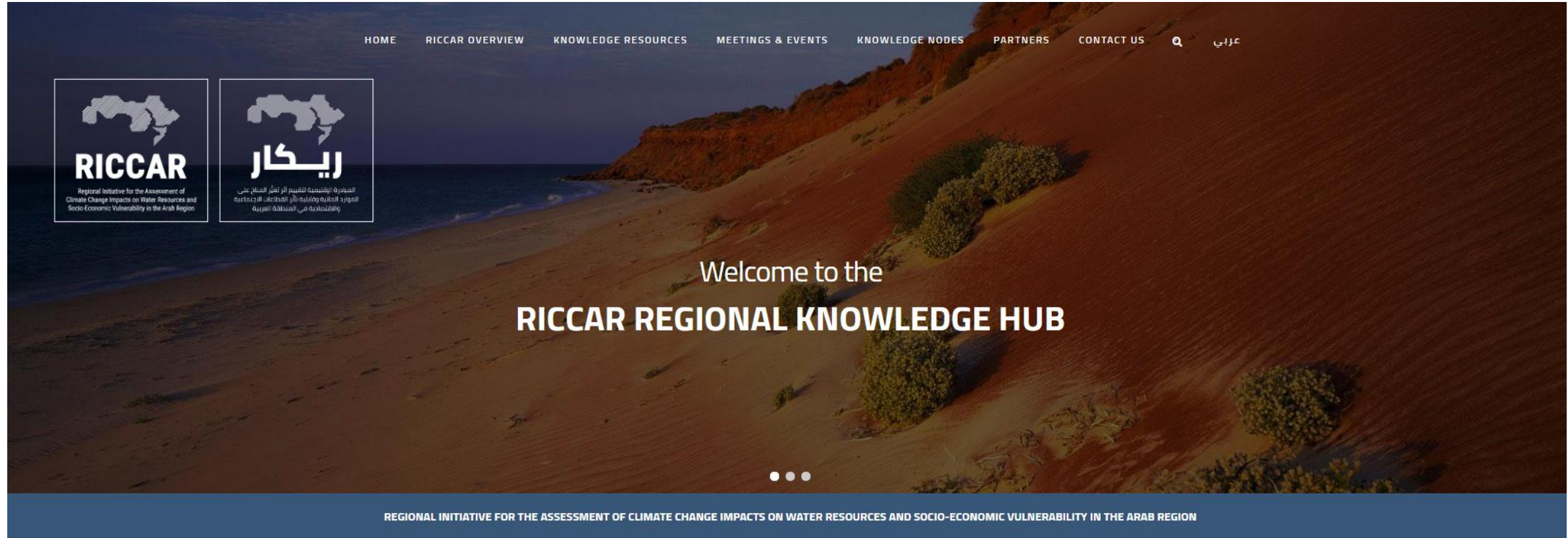
[VIEW](#)

Seventh Regional Training Workshop on Capacity Development for Climate Change Negotiations for the Arab Countries

Date: 25-29 September 2016

Location: Rabat, Morocco

[VIEW](#)



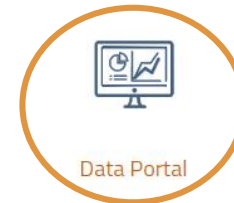
Partners



Overview



Meetings & Events



Data Portal

Data Portal

Climate data

- Temperature
- Precipitation
- Extreme Climate Indices

Hydrology data

- Runoff
- Evapotranspiration

Vulnerability Assessment data

- Indicators and outputs for RICCAR VA study

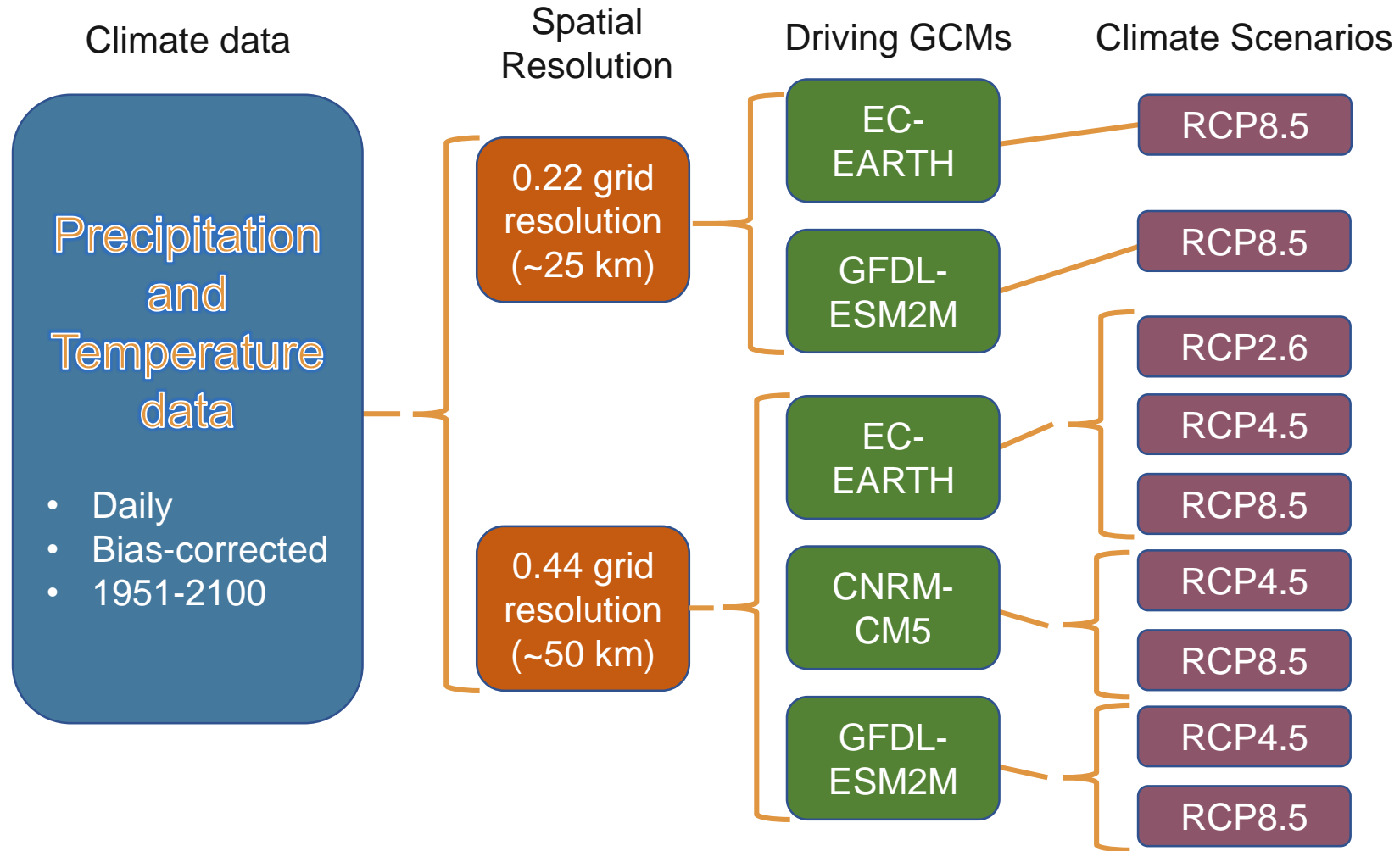
Advantages

- Bias-corrected climate data
- Data uses Gregorian calendar
- Data in commonly used units of measurement
- Hydrology data based on hydrological models rather than from climate model outputs
- Extreme climate indices outputs readily available
- Site allows for interactive usage and easy navigation
- Open source

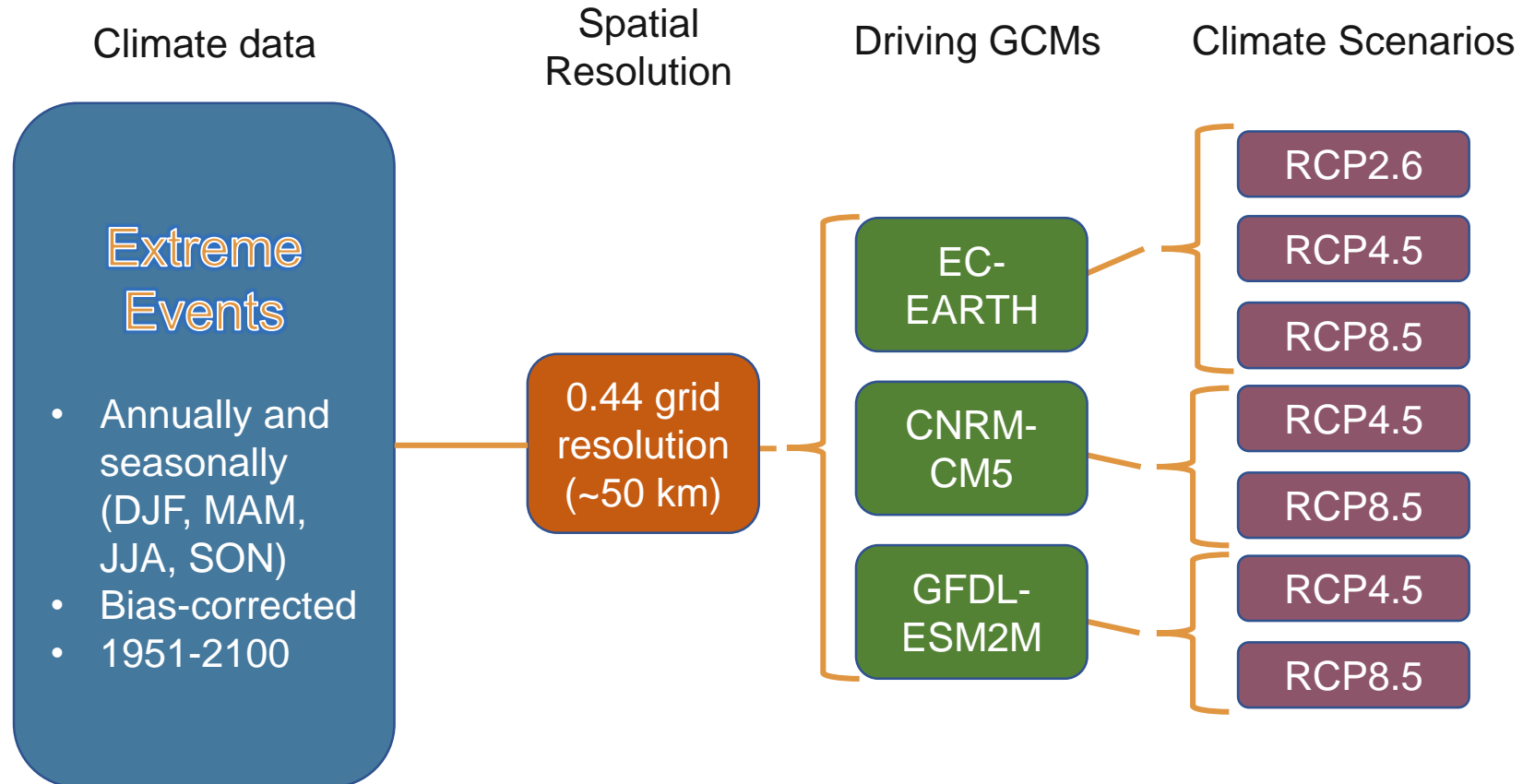
Disadvantages

- Limited climate data available
- Other sources may have finer spatial and/or temporal resolution
- Gapped data along some coastal areas due to bias-correction

RICCAR Climate Data Availability (Precipitation & Temperature Data)



RICCAR Climate Data Availability (Extreme Events)



Extreme Temperature Indices

Index	Long Name	Definition
SU	Number of summer days	Number of days (annually or seasonally) when daily maximum temperature $\geq 25^{\circ}\text{C}$
SU35	Number of hot days	Number of days (annually or seasonally) when daily maximum temperature $\geq 35^{\circ}\text{C}$
SU40	Number of very hot days	Number of days (annually or seasonally) when daily maximum temperature $\geq 40^{\circ}\text{C}$
TR	Number of tropical nights	Number of days (annually or seasonally) when daily minimum temperature $\geq 20^{\circ}\text{C}$

Extreme Precipitation Indices

Index	Long Name	Definition
CDD	Maximum length of dry spell	Maximum number of consecutive days when daily precipitation < 1 mm
CWD	Maximum length of wet spell	Maximum number of consecutive days when daily precipitation \geq 1 mm
R10	Number of 10 mm precipitation days	Number of days when daily precipitation \geq 10mm
R20	Number of 20 mm precipitation days	Number of days when daily precipitation \geq 20mm
SDII	Simple precipitation intensity index	Ratio of total precipitation (annually or seasonally) the number of wet days

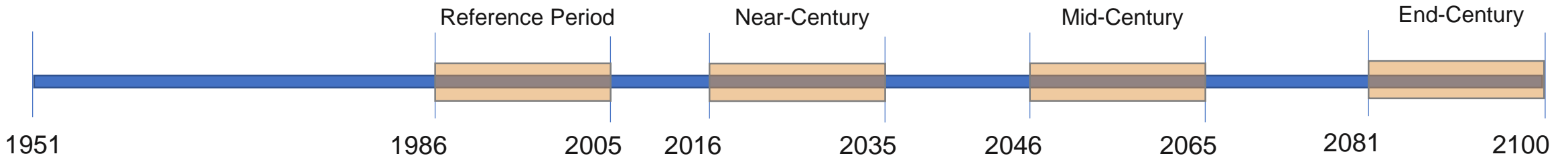
Climate Data Ensembles

CNRM-
CM5

EC-
EARTH

GFDL-
ESM2M

RCM outputs based on 3 driving GCMs

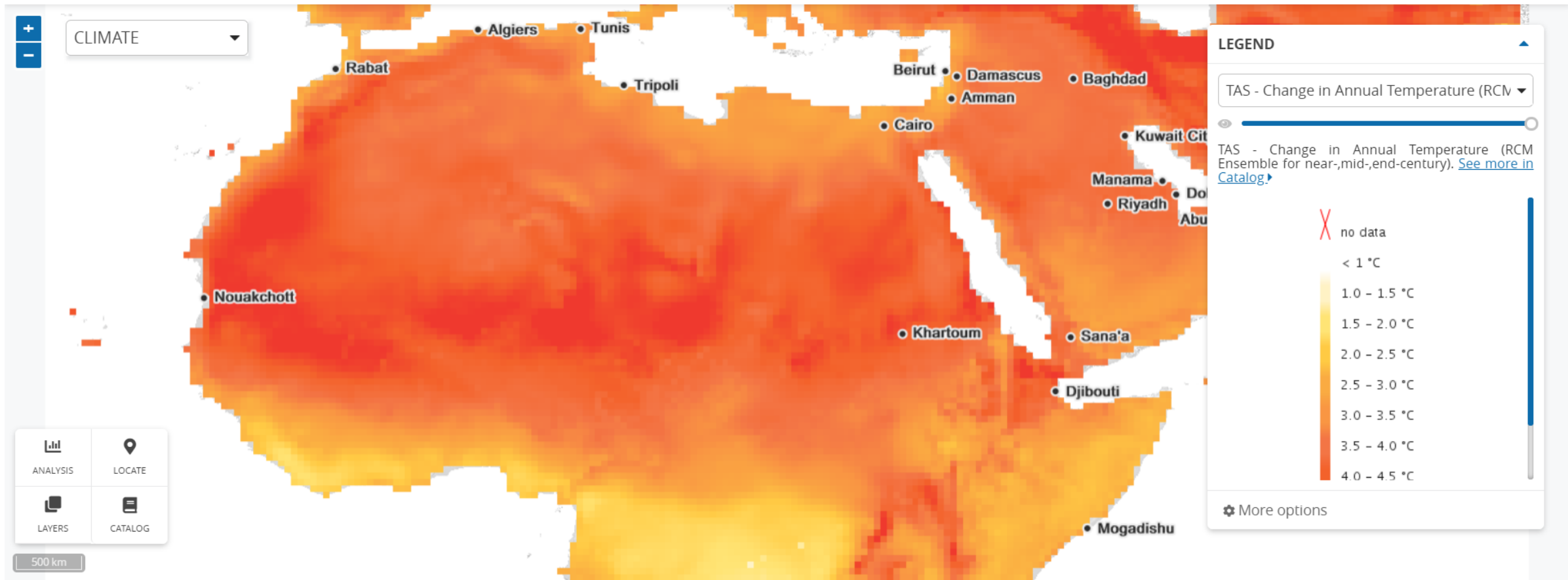


Ensemble mean from 3 model outputs over 20-year periods (based on IPCC)



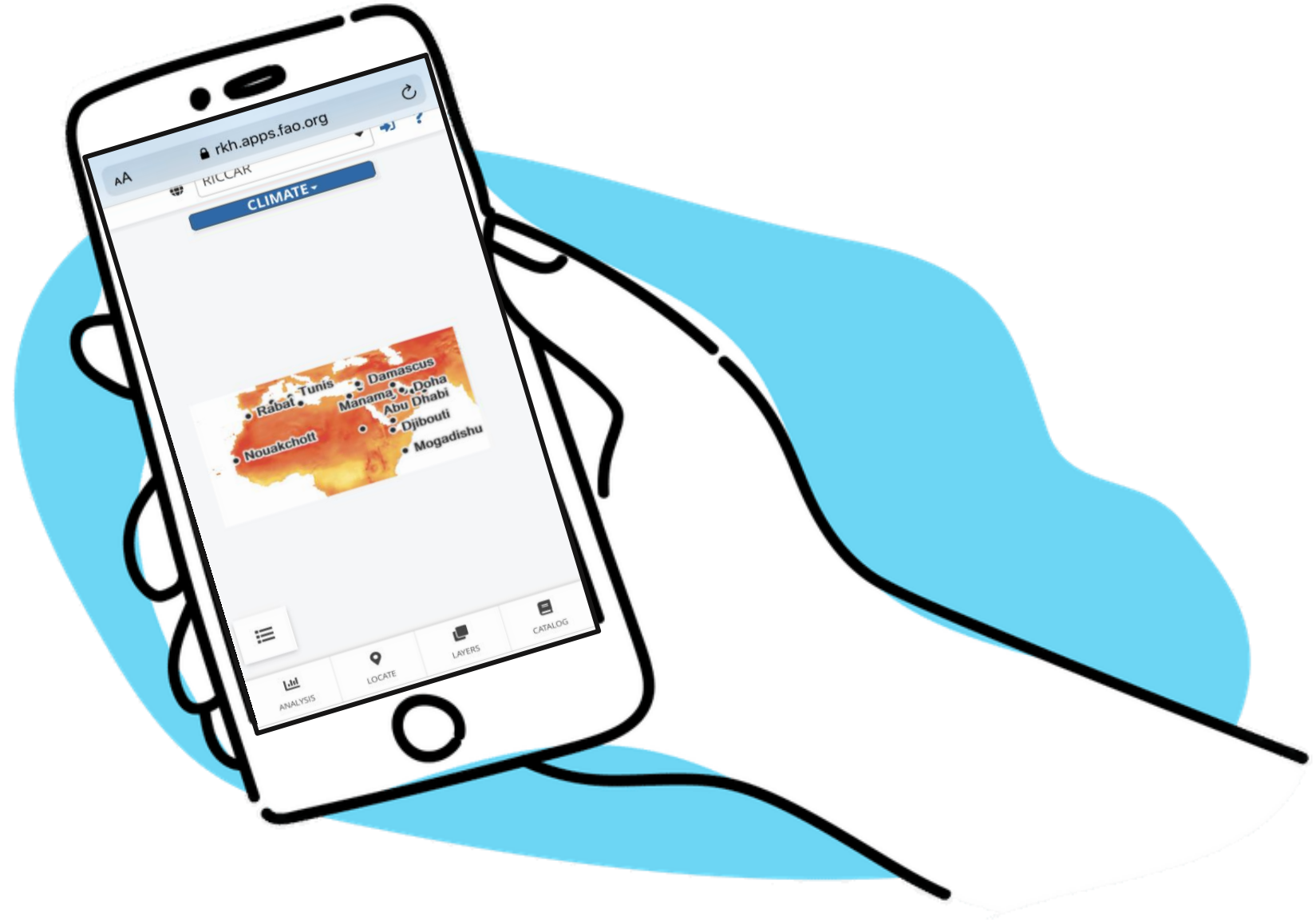
Map

My Profile ? About

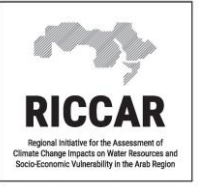


Change in temperature: End-century RCP8.5

Data Portal (Mobile Device)



Locate Tool: Obtain results for specific location



The screenshot displays the FAO Locate tool interface. On the left, a map shows a temperature change overlay over West Africa, with 'Nouakchott' labeled. A search bar contains 'Damascus'. A popup window provides details for the selected location:

TAS - Change in Annual Temperature (RCM Ensemble for near-,mid-,end-century)	
Timeframe	End-Century (2081-2100)
Climate Scenario	RCP8.5 (High)
Value	3.3
Unit	°C
Lat, Lon	33.5138, 36.2765

Buttons at the bottom of the popup include 'Save location' and 'Point Time Series'. The background interface includes a 'CLIMATE' dropdown, a 'Map' button, and a 'LOCATE' icon in the bottom left navigation menu.

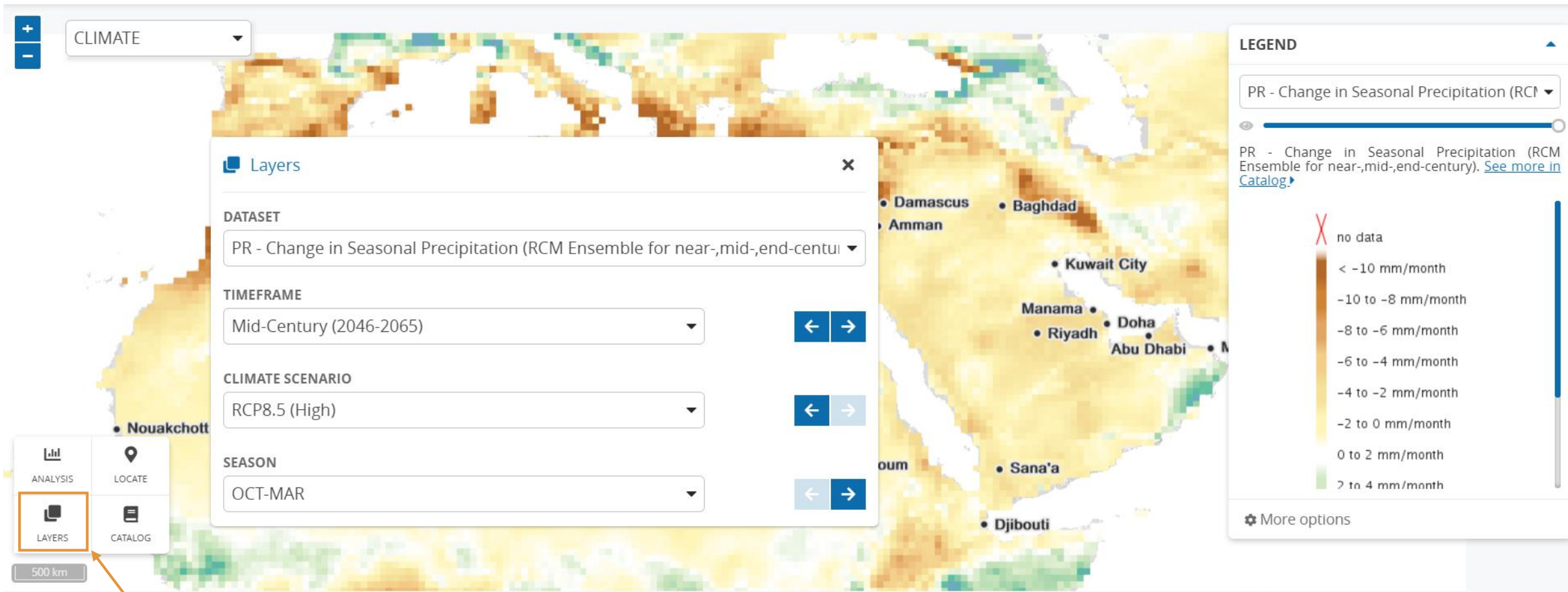
Select locate icon

Layers Tool: Change data layers



Map

My Profile ? About



CLIMATE

Layers

DATASET
PR - Change in Seasonal Precipitation (RCM Ensemble for near-,mid-,end-centu

TIMEFRAME
Mid-Century (2046-2065)

CLIMATE SCENARIO
RCP8.5 (High)

SEASON
OCT-MAR

LEGEND
PR - Change in Seasonal Precipitation (RCM Ensemble for near-,mid-,end-century). [See more in Catalog](#)

- no data
- < -10 mm/month
- 10 to -8 mm/month
- 8 to -6 mm/month
- 6 to -4 mm/month
- 4 to -2 mm/month
- 2 to 0 mm/month
- 0 to 2 mm/month
- > 2 to 4 mm/month

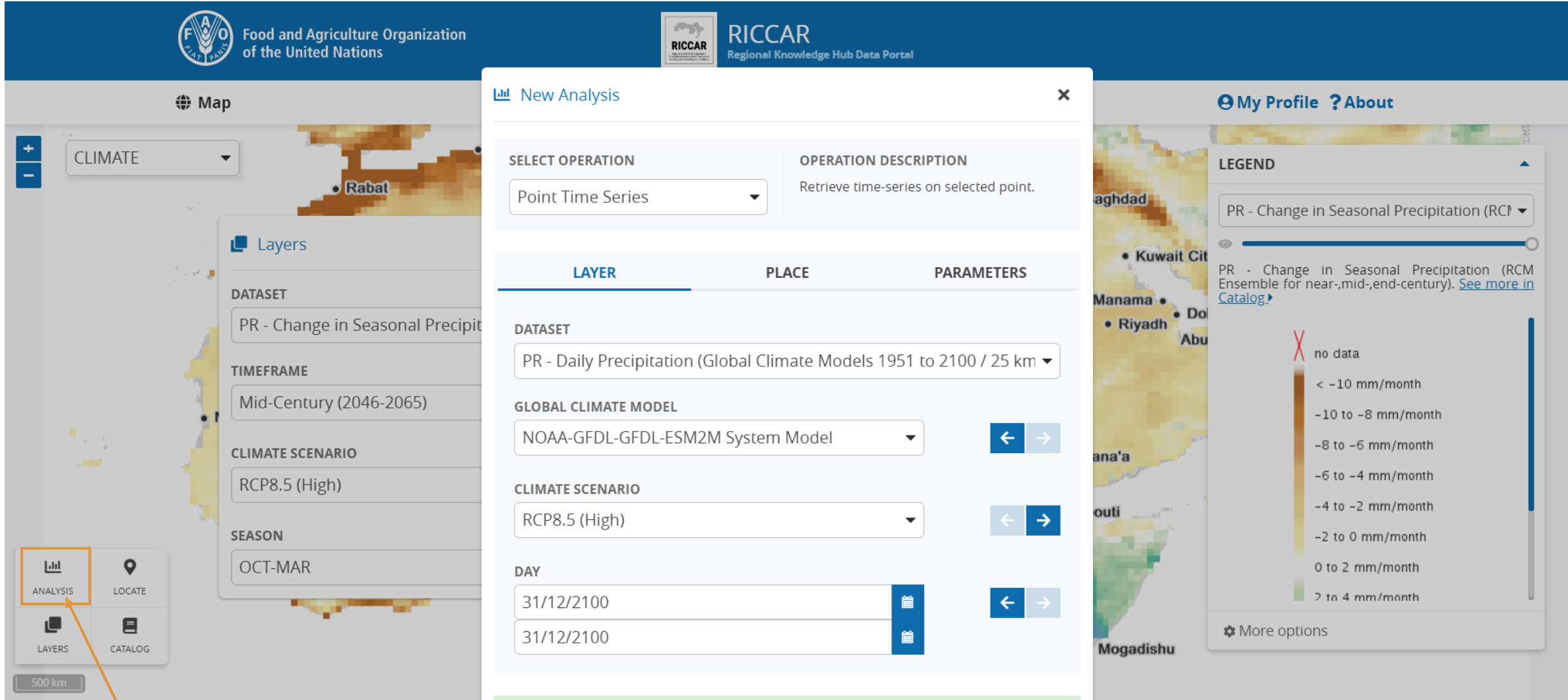
More options

ANALYSIS LOCATE LAYERS CATALOG

500 km

Select layers icon

Analysis Tool: Time series analysis

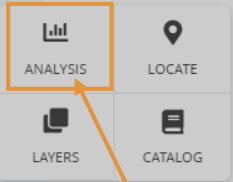


The screenshot displays the RICCAR web application interface. At the top, the logos for the Food and Agriculture Organization of the United Nations and RICCAR (Regional Knowledge Hub Data Portal) are visible. The main interface includes a map, a 'Layers' panel, and a 'New Analysis' modal window.

The 'New Analysis' modal window is open, showing the following configuration:

- SELECT OPERATION:** Point Time Series
- OPERATION DESCRIPTION:** Retrieve time-series on selected point.
- LAYER:** PR - Daily Precipitation (Global Climate Models 1951 to 2100 / 25 km)
- PLACE:** (Empty)
- PARAMETERS:**
 - DATASET:** PR - Daily Precipitation (Global Climate Models 1951 to 2100 / 25 km)
 - GLOBAL CLIMATE MODEL:** NOAA-GFDL-GFDL-ESM2M System Model
 - CLIMATE SCENARIO:** RCP8.5 (High)
 - DAY:** 31/12/2100

The map in the background shows a region with a legend for 'PR - Change in Seasonal Precipitation (RCM Ensemble for near-,mid-,end-century)'. The legend includes a color scale from red (no data) to blue (positive change) and a 'More options' button.



ANALYSIS LOCATE
LAYERS CATALOG

Select analysis icon

Analysis Tool: Time series analysis

New Analysis

SELECT OPERATION

Point Time Series

LAYER

Custom Point
POINT [33.5138, 36.2765]

[SELECT NEW PLACE](#)

New Analysis ✕

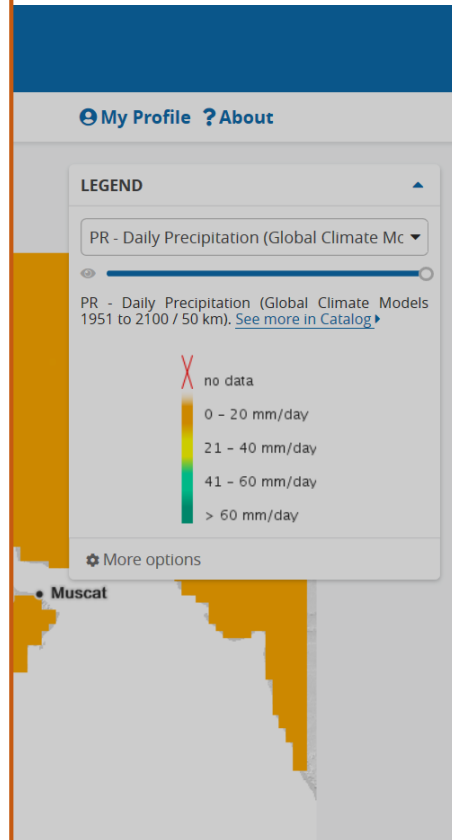
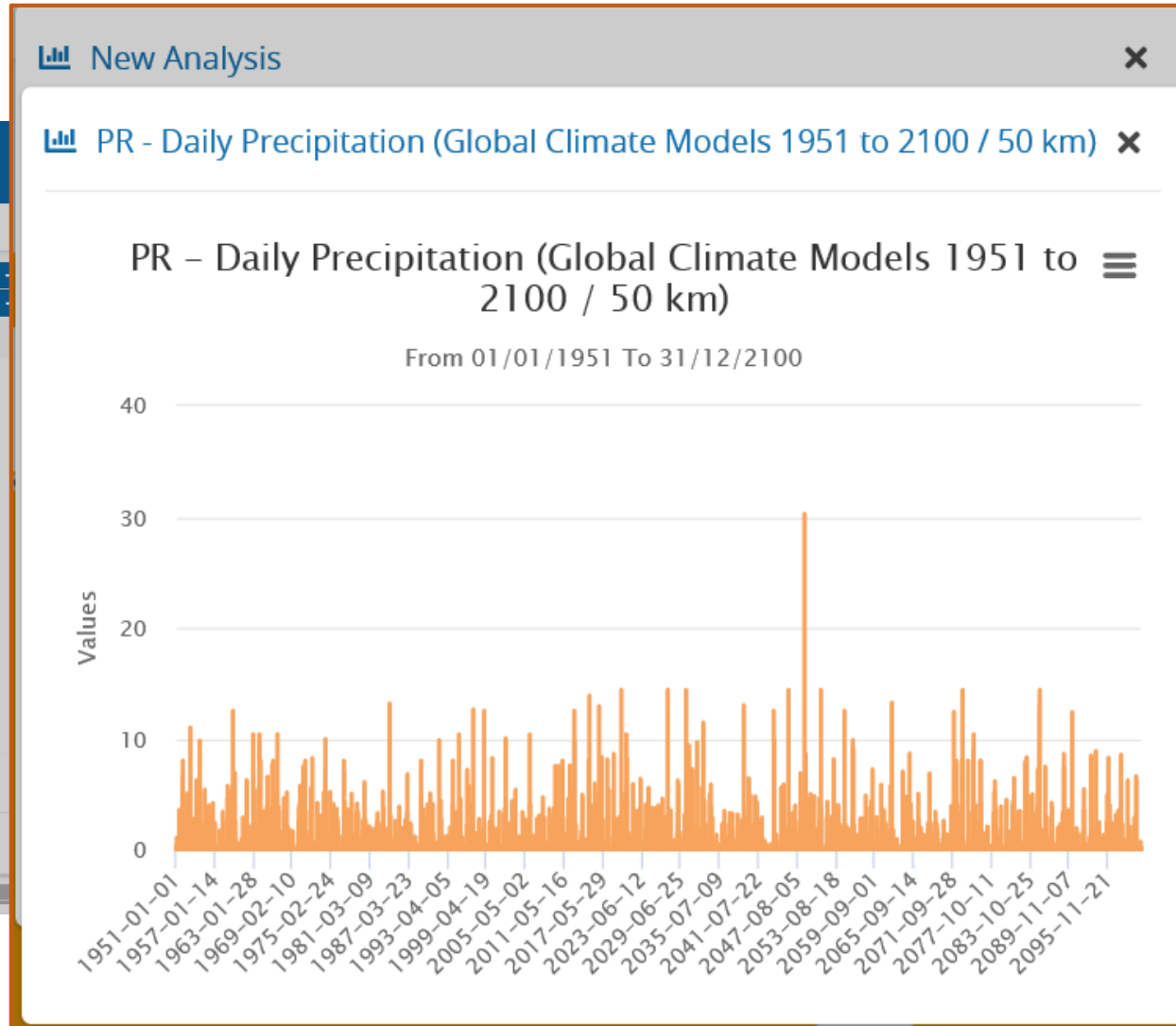
SELECT OPERATION **OPERATION DESCRIPTION**

Point Time Series Retrieve time-series on selected point.

LAYER	PLACE	PARAMETERS
<p>FROM</p> <p>01/01/1951 📅</p> <p>TO</p> <p>31/12/2100 📅</p>	<p>SAVED TIME SERIES</p> <p>Select a saved time series ▼</p> <p>Save in Profile</p>	

Run Operation

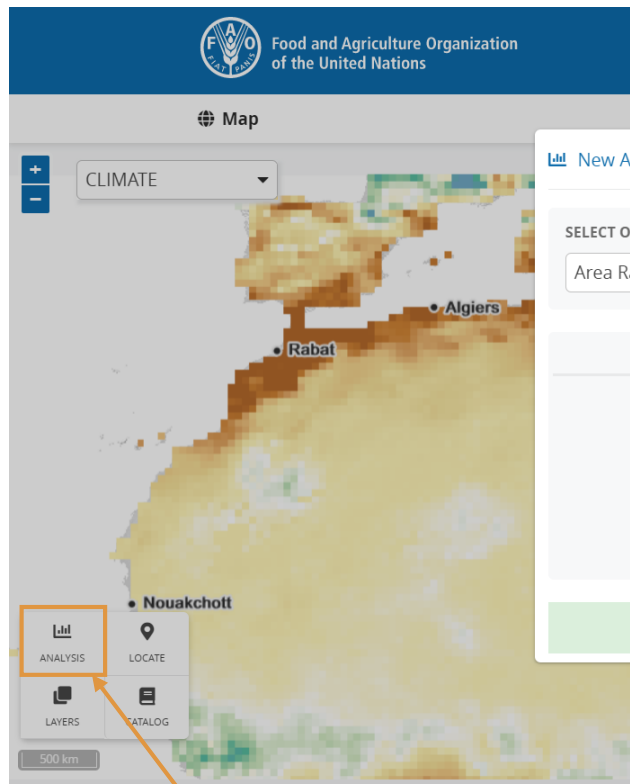
Analysis Tool: Time series analysis



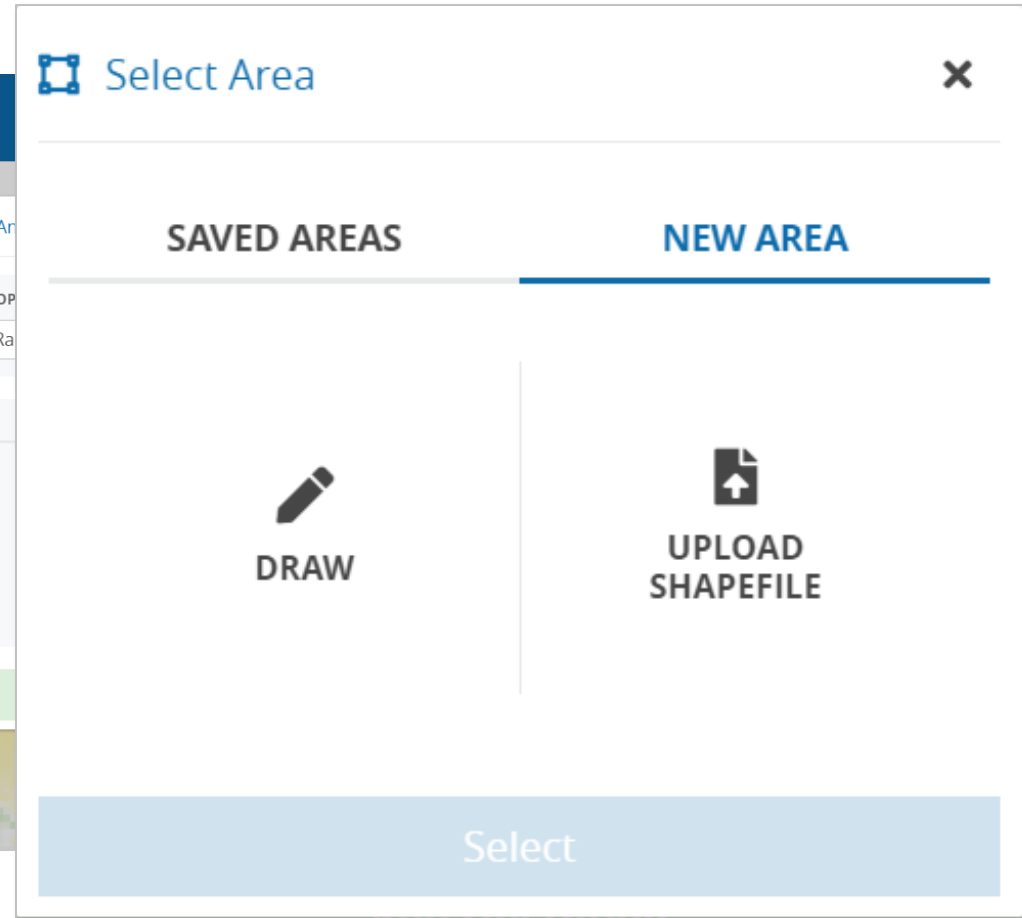
Notes:

1. Analysis is for one single climate model
2. Recommend downloading data for all 3 models
3. Best suited for inputting data into other studies (i.e. hydrological model), then report output as ensemble

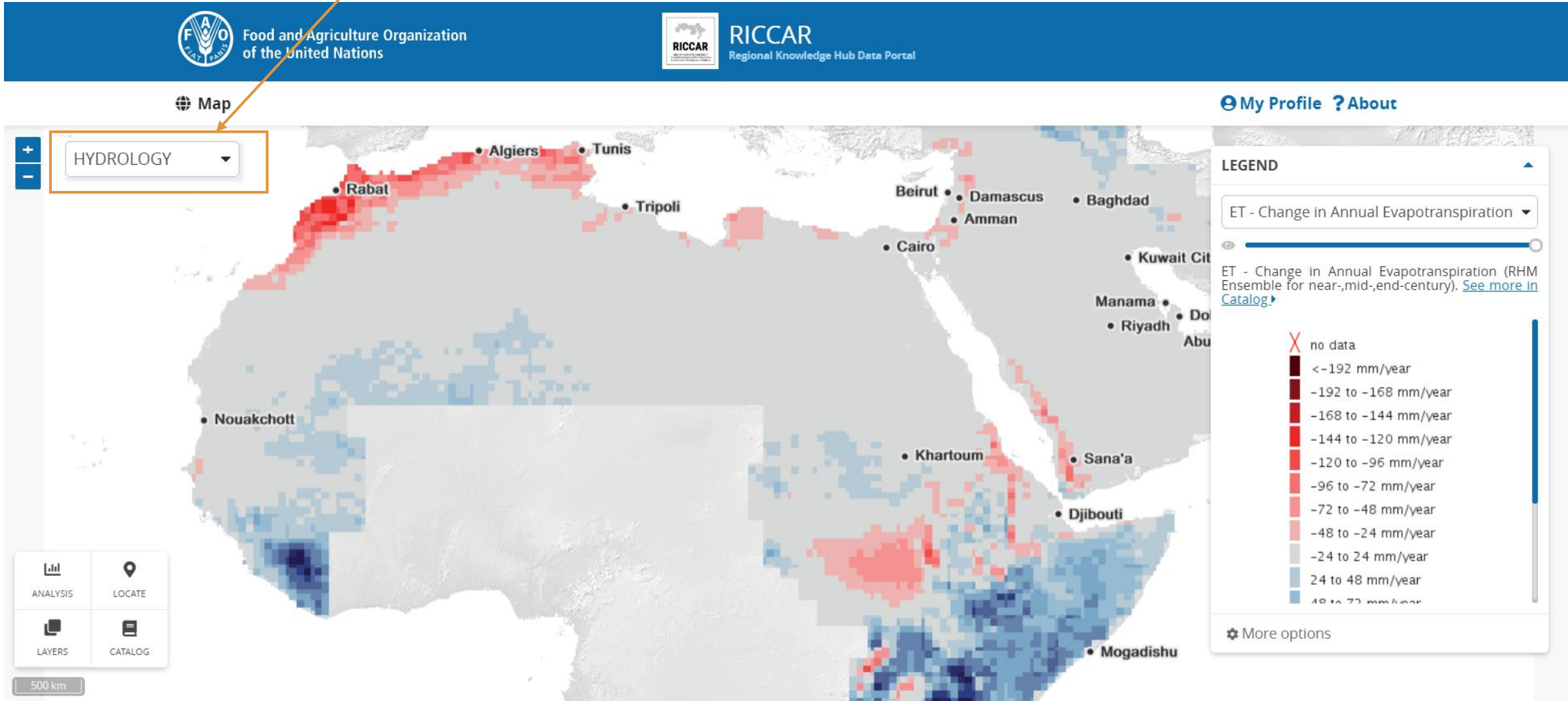
Analysis Tool: Area raster download



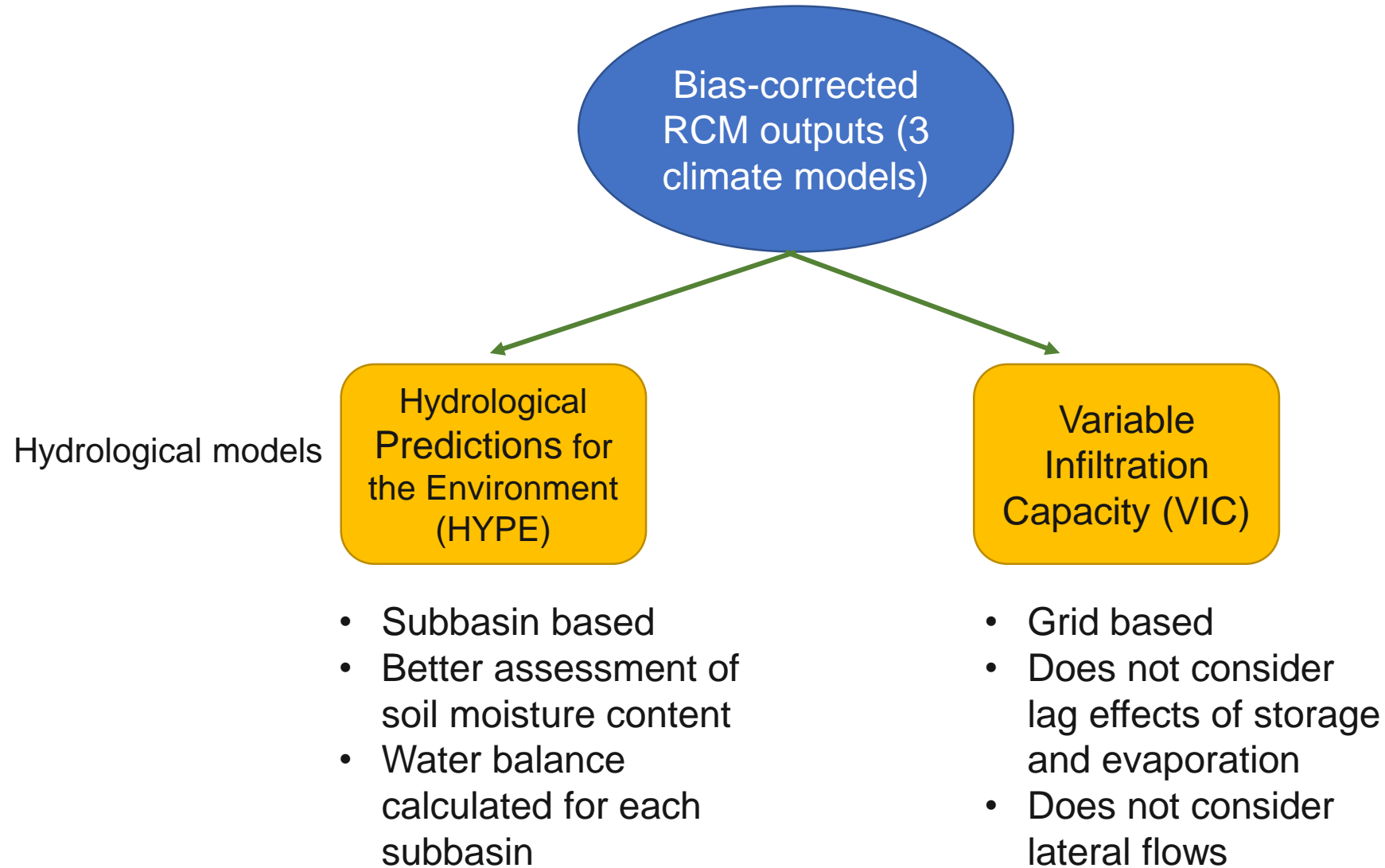
Select analysis icon




Dataset drop down box



Overview of Regional Hydrology Modelling



 Layers ✕

DATASET

ET - Change in Annual Evapotranspiration (RHM Ensemble for near-,mid-,end-centuri ▼

TIMEFRAME

End-Century (2081-2100) ▼ ← →

CLIMATE SCENARIO

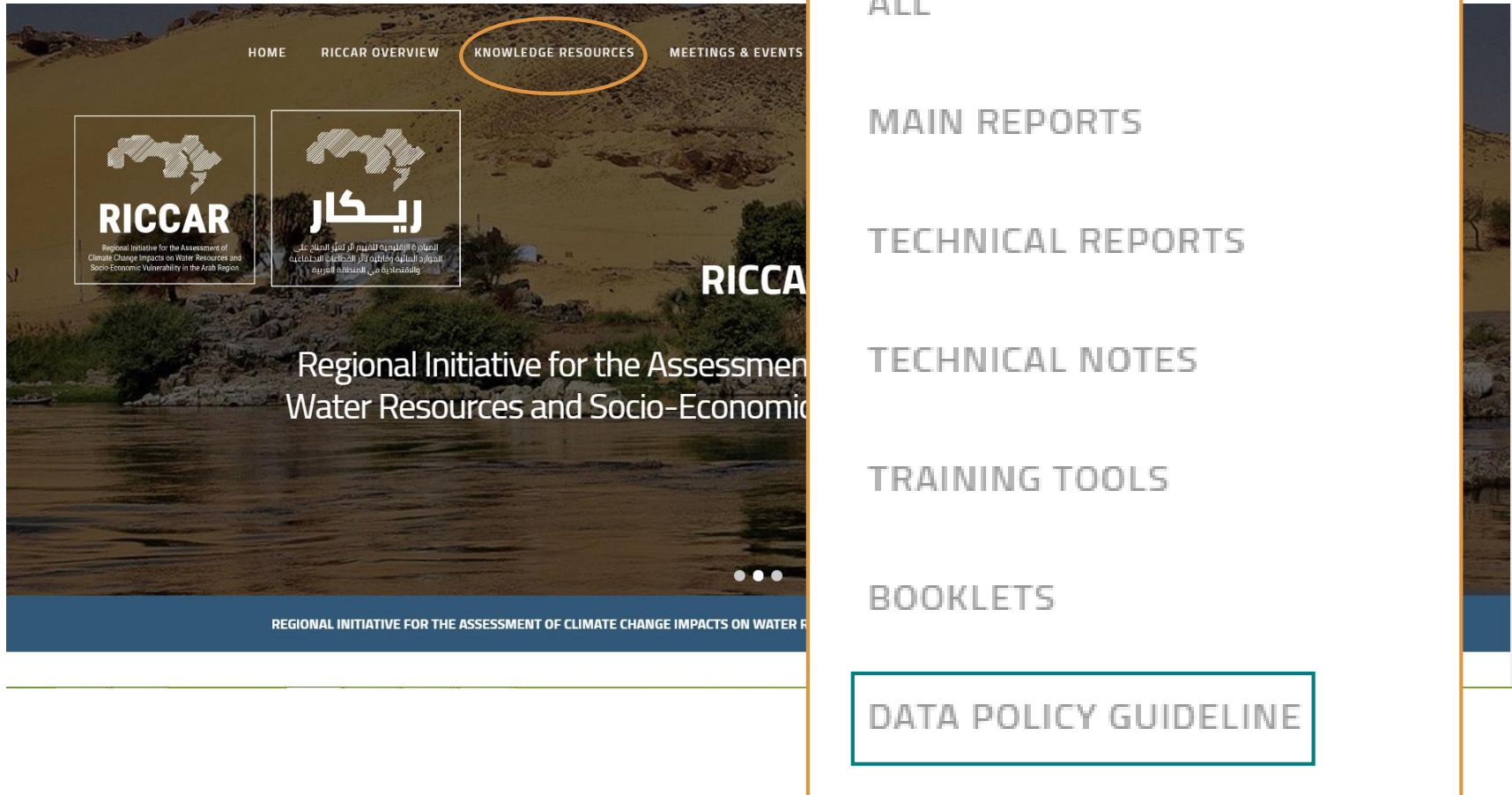
RCP8.5 (High) ▼ ← →

HYDROLOGY MODEL

VIC (Variable Infiltration Capacity) ▼ ← →

Daily data is available only upon request (not online)

Link to Knowledge Resources



The image shows a screenshot of the RICCAR website. The navigation menu at the top includes 'HOME', 'RICCAR OVERVIEW', 'KNOWLEDGE RESOURCES' (circled in orange), and 'MEETINGS & EVENTS'. Below the navigation, there are two logos: the English 'RICCAR' logo and the Arabic 'ريكار' logo. The main content area features the text 'Regional Initiative for the Assessment of Water Resources and Socio-Economic' and 'RICCAR'. A dropdown menu is open on the right side, listing the following categories: 'ALL', 'MAIN REPORTS', 'TECHNICAL REPORTS', 'TECHNICAL NOTES', 'TRAINING TOOLS', 'BOOKLETS', and 'DATA POLICY GUIDELINE'. The 'DATA POLICY GUIDELINE' option is highlighted with a teal border.

ALL

MAIN REPORTS

TECHNICAL REPORTS

TECHNICAL NOTES

TRAINING TOOLS

BOOKLETS

DATA POLICY GUIDELINE



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.

The RICCAR outputs and constituent databases are based on an integrated assessment methodology that includes:

- Regional climate modelling (RCM) outputs for the CORDEX-MENA Domain (Arab Domain), which is among the domains included in the Coordinated Regional Climate Downscaling Experiment (CORDEX) of the World Climate Research Programme.
- Regional hydrological modelling (RHIM) outputs for the surface water basins in Arab States, including the land and water areas of surface water basins that are shared or transboundary in nature that include areas external to the Arab region.
- Integrated vulnerability assessment (VA) outputs for various sectors across the Arab region covering the 21 Arab States included in the MENA Domain.

The RICCAR assessment outputs are available in the [Arab Climate Change Assessment Report: Main Report](#) and its [Technical Annex](#).

2. Principles of data acquisition and access

2.1. Users may request bias-corrected regional climate modeling (RCM) and regional hydrological modeling (RHIM) outputs for the Arab Domain. Available RCM and RHIM output variables are described in the RICCAR Technical Note [Regional Climate Modelling and Regional Hydrological Modelling Applications in the Arab Region](#) prepared by SMHI.

- Temperature, precipitation, and hydrological outputs are available with daily frequency from 1950 to 2100 for RCP 4.5 and RCP 8.5 at the scale of 50x50 km. Extreme climate indices are available both annually and seasonally for the same period.
- RCM and RHIM ensembles for the reference period, near-century, mid-century, and end-century are available for RCP 4.5 and RCP 8.5 at the scale of 50x50 km.

2.2. Users may also request socio-economic geospatial data used for the integrated vulnerability assessment (VA), described in the RICCAR Technical Note [Integrated Vulnerability Assessment: Arab Regional Application](#) prepared by UN-ESCWA, ACSAD and GIZ.



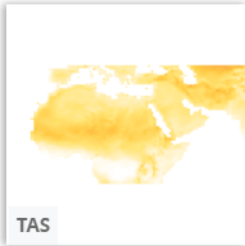
[Back to map](#) > **Catalog**

[My Profile](#) [? About](#)

CLIMATE

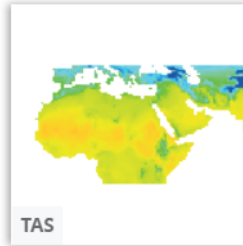
Filter by Category

TAS - Change in Annual Temperature (RCM Ensemble for near-,mid-,end-century)



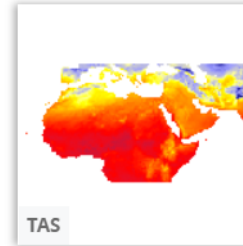
TAS - Change in Annual Temperature (RCM Ensemble for near-,mid-,end-century).

TAS - Annual Temperature (RCM Ensemble for reference period)



TAS - Annual Temperature (RCM Ensemble for reference period).

TAS - Daily Mean Temperature (Global Climate Models 1951 to 2100 / 25 km)



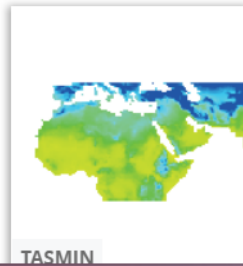
TAS - Daily Mean Temperature (Global Climate Models 1951 to 2100 / 25 km).

TASMIN - Change in Annual Minimum Temperature (RCM Ensemble for near-,mid-,end-century)



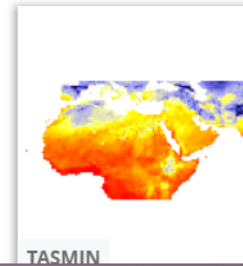
TASMIN - Change in Annual Minimum Temperature (RCM Ensemble for near-,mid-,end-century).

TASMIN - Annual Minimum Temperature (RCM Ensemble for reference period)



TASMIN - Annual Minimum Temperature (RCM Ensemble for reference period).

TASMIN - Daily Minimum Temperature (Global Climate Models 1951 to 2100 / 25 km)



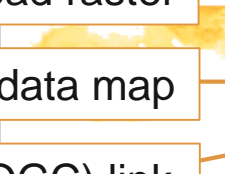

TASMIN - Daily Minimum Temperature (Global Climate Models 1951 to 2100 / 25 km).



Description

TAS - Change in Annual Temperature (RCM Ensemble for near-,mid-,end-century)

Additional Information


Timeframe	Climate Scenario		
End-Century (2081-2100)	RCP4.5 (Moderate)		Download raster Link back to data map Open Geospatial Consortium (OGC) link
End-Century (2081-2100)	RCP8.5 (High)		

 Download

 See on map

 OGC Link

 Download

 See on map

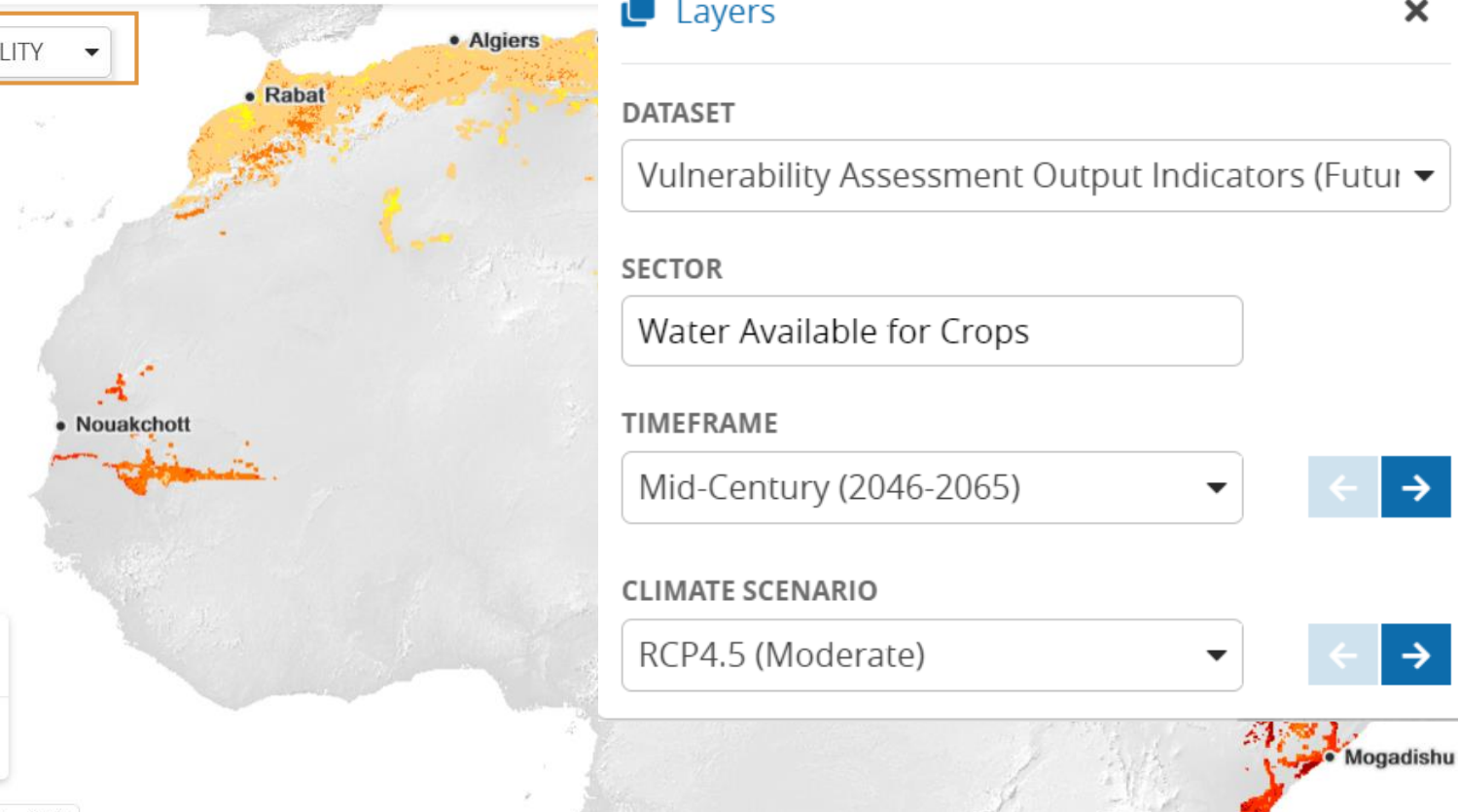
 OGC Link



Map

My Profile ? About

+
-
VULNERABILITY ▾



ANALYSIS

LOCATE

LAYERS

CATALOG

Layers ✕

DATASET

Vulnerability Assessment Output Indicators (Futur ▾)

SECTOR

Water Available for Crops

TIMEFRAME

Mid-Century (2046-2065) ▾ ← →

CLIMATE SCENARIO

RCP4.5 (Moderate) ▾ ← →

LEGEND

Vulnerability Assessment Output Indicator ▾

—

Vulnerability Assessment Output Indicators - Vulnerability (Future). [See more in Catalog](#)






Low Vulnerability

High Vulnerability

no data

⚙ More options

Evaluated sectors/subsectors for VA

	SECTORS	SUBSECTORS
	Water	Water availability
	Biodiversity and Ecosystems	Area covered by forests Area covered by wetlands
	Agriculture	Water available for crops Water available for livestock
	Infrastructure and Human Settlements	Inland flooding area
	People	Water available for drinking Health conditions due to heat stress Employment rate for the agricultural sector



Description

Sensitivity - Natural

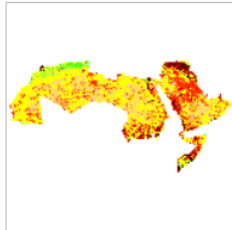
Additional Information




Natural



Degradation of Vegetation Cover

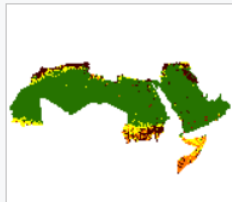


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Land Use - Land Cover



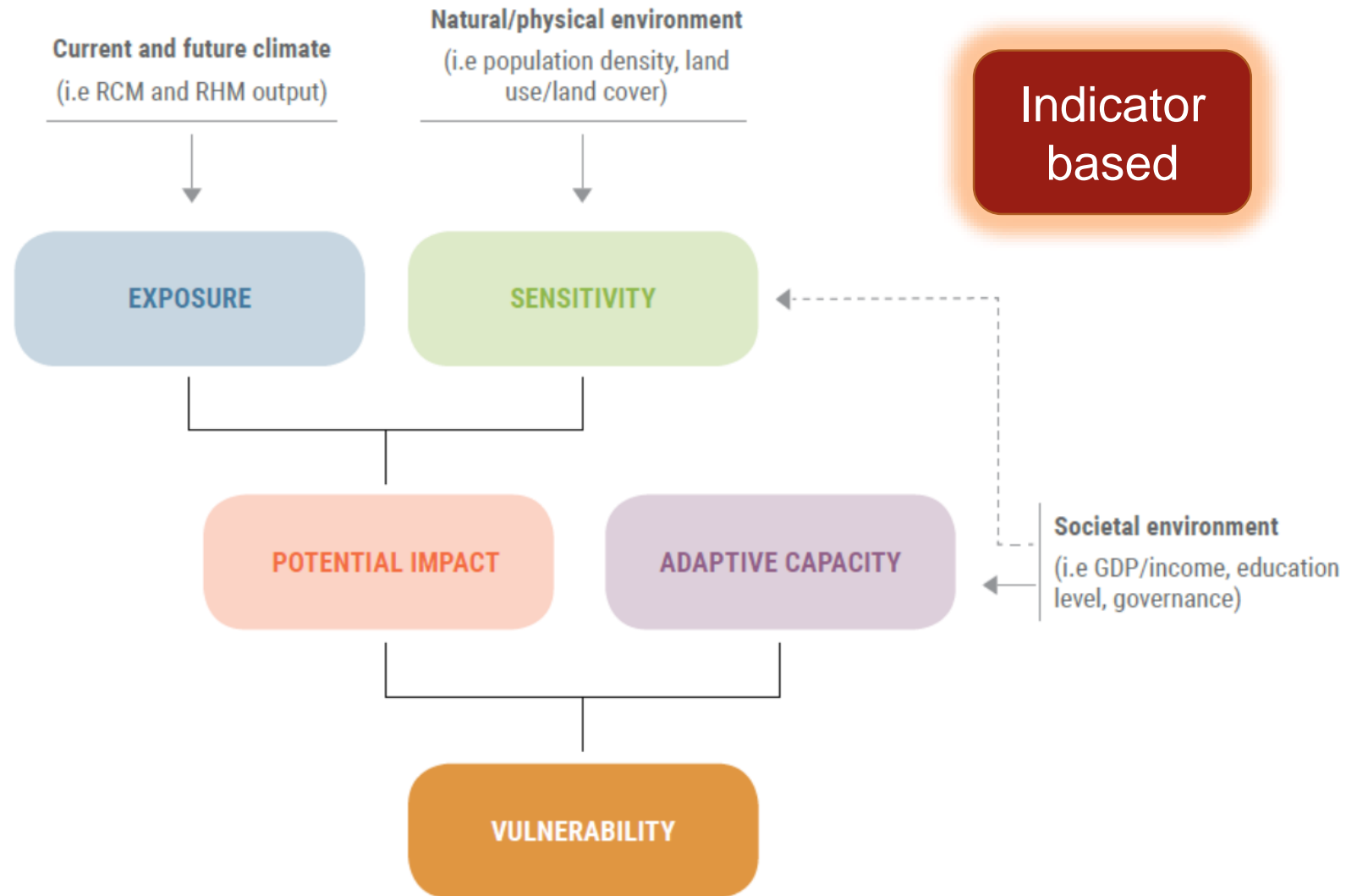
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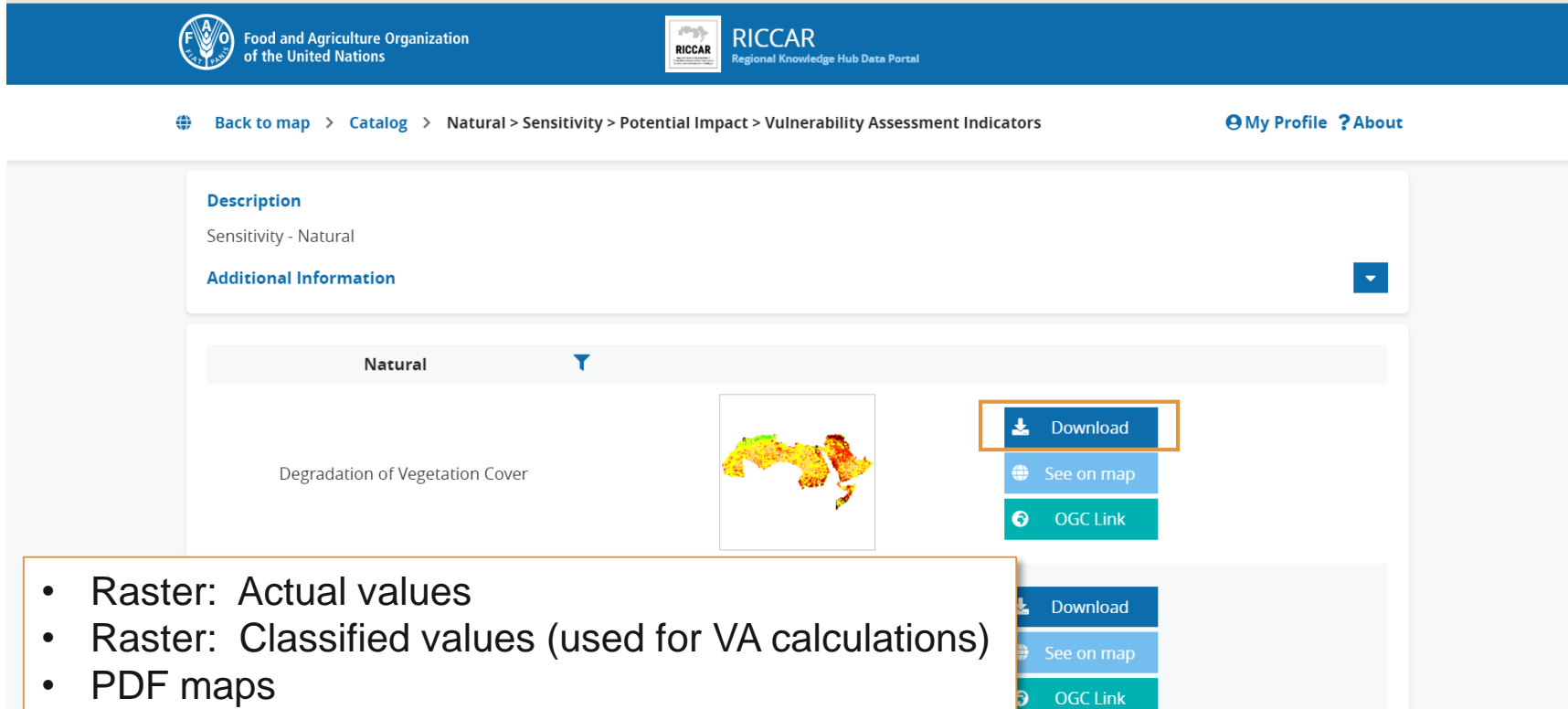
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 OGC Link

Vulnerability assessment
indicators

Vulnerability Assessment Framework





Food and Agriculture Organization of the United Nations

RICCAR Regional Knowledge Hub Data Portal

Back to map > Catalog > Natural > Sensitivity > Potential Impact > Vulnerability Assessment Indicators

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Description

Sensitivity - Natural

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Natural

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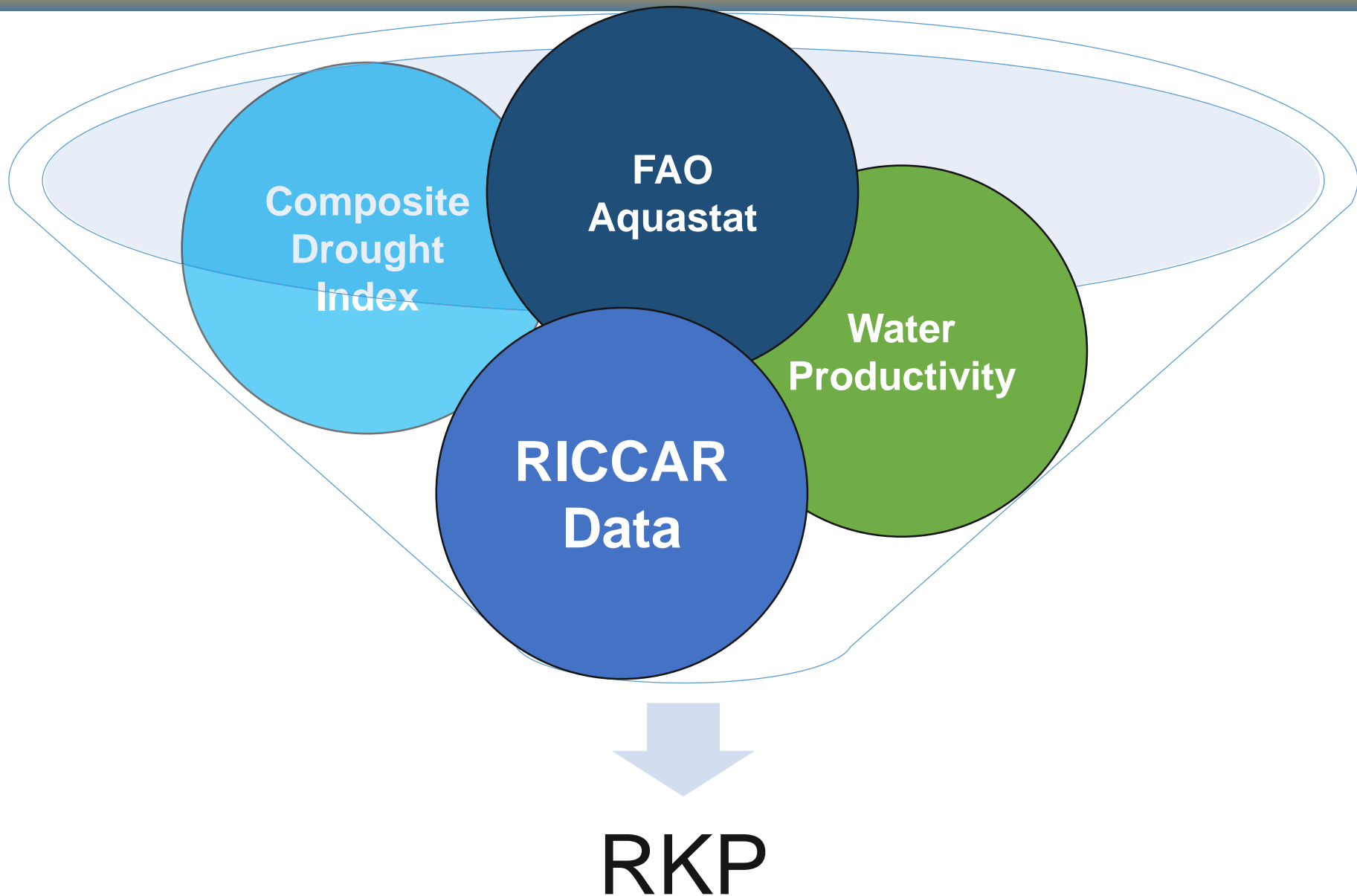
- Raster: Actual values
- Raster: Classified values (used for VA calculations)
- PDF maps
- Fact sheet
- Spreadsheet



Degradation of Vegetation Cover

Indicator fact sheet			
Indicator	Degradation of vegetation cover		
Vulnerability component and dimension	Sensitivity	Natural	
Description	Change in change in vegetation cover between 2000 and 2011 as obtained from the Normalized Difference of Vegetation Index (NDVI)		
Applicable subsectors and impacts with corresponding weight of indicator in the impact chain (by dimension and indicator)	Water: <i>Water availability</i>	0.26	0.26
	Biodiversity and Ecosystems: <i>Area covered by forests</i>	0.50	0.13
	Biodiversity and Ecosystems: <i>Area covered by wetlands</i>	0.50	0.27
	Agriculture: <i>Water available for crops</i>	0.26	0.32
	Agriculture: <i>Water available for livestock</i>	0.50	0.17
	Infrastructure and Human Settlements: <i>Inland</i>	0.25	0.22

- Indicator data source
- Year data obtained
- Vulnerability assessment classification
- Spatial resolution



MAWRED knowledge hub

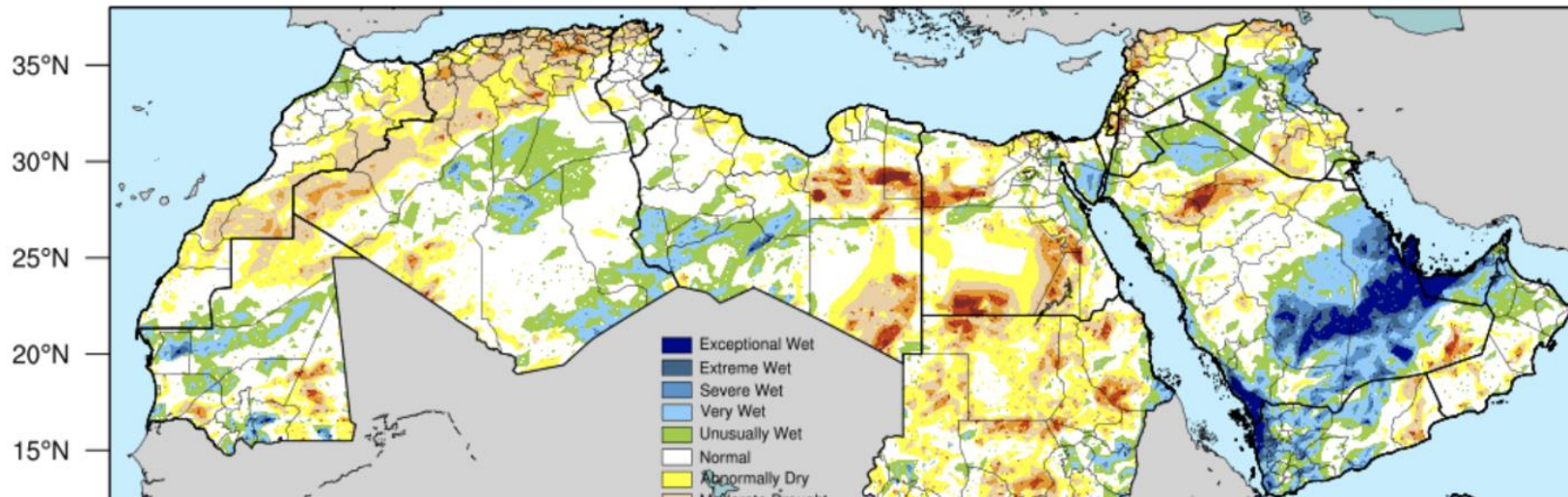
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This month's drought map for MENA

A monthly map based on a [Composite Drought Index \(CDI\)](#) is generated to show the areas under various degrees of drought relative to the average monthly conditions at the country and MENA region level. It considers the causative variables of multi drought forms (mainly meteorological and agricultural). The resulting map is formed by integrating several remotely sensed data sets from NASA, NOAA and other U.S. agencies and modeled data sets in ICBA into a composite drought index. The exact weightings of the different data set input to the CDI have been discussed and agreed for each country, reflecting the varying nature of drought across the region.

Click on the link to find out [How the drought map was generated](#)

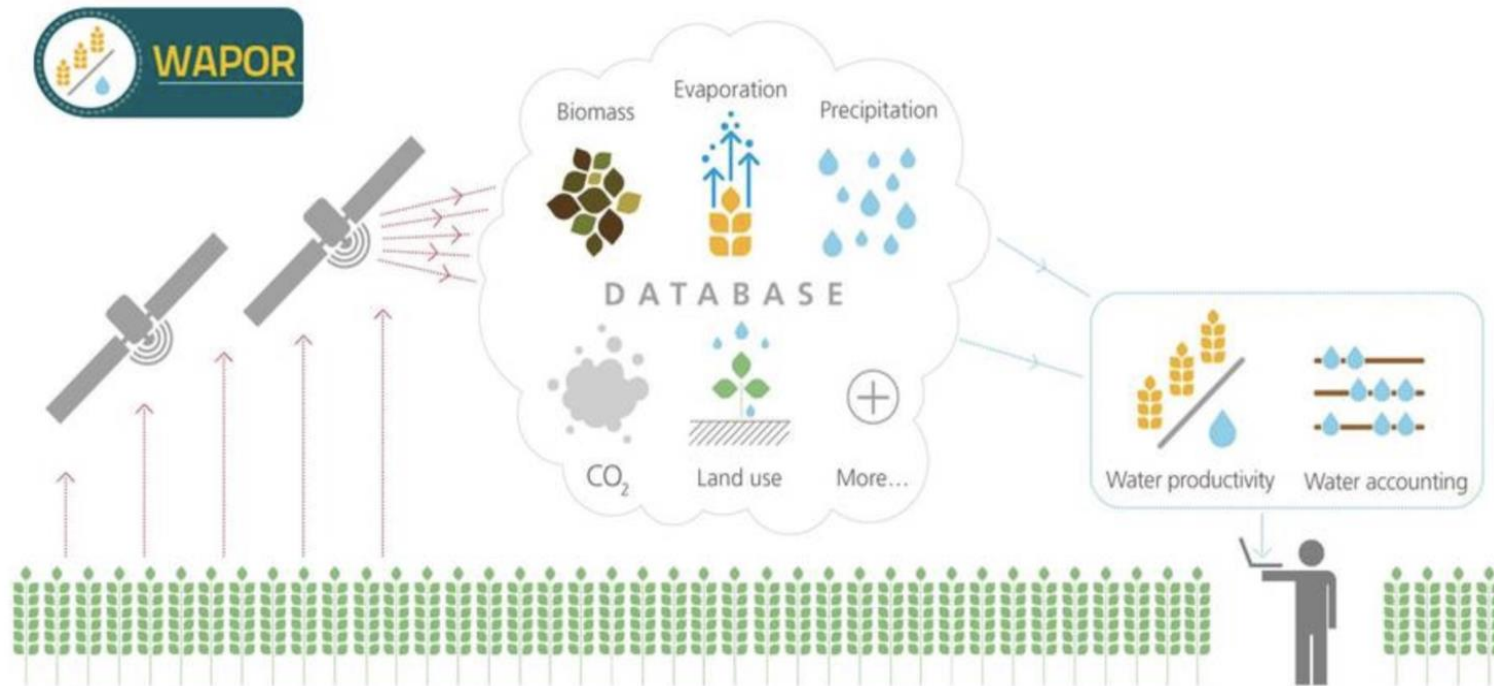
Composite Drought Index for 03/2017






WaPOR, remote sensing for water productivity

	Overview	Water and land productivity assessment	Water accounting	Capacity development	Resources	News
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AQUASTAT - FAO's Global Information System on Water and Agriculture

	Overview	Databases	Geospatial Information	Profiles	Data Analysis	Activities	Publications
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AQUASTAT is the FAO global information system on water resources and agricultural water management. It collects, analyses and provides free access to over 180 variables and indicators by country from 1960. AQUASTAT draws on national capacities and expertise with an emphasis on Africa, the Near East, countries of the former Soviet Union, Asia, and Latin America and the Caribbean. AQUASTAT plays a key role in the monitoring of the Sustainable Development Goal 6 that sets out to "ensure availability and sustainable management of water and sanitation for all", and in particular indicators of target 6.4 on water stress and water use efficiency.

Did you know?

- **79 countries compiled the 2018 AQUASTAT questionnaire on water and agriculture.** The data collected through this questionnaire and validated are now available in the AQUASTAT core database.



RICCAR

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

Thank you!
www.riccar.org