RICCAR

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

Overview of RICCAR and the *Arab Climate Change Assessment Report*

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RICCAR Coordinator
Chief, Water Resources Section
UN-ESCWA

High Level Conference on Climate Change Assessment and Adaptation in the Arab Region – Beirut, Lebanon – 26-28 September 2017

Intergovernmental Mandates calling for & supporting Climate Change Assessment in the Arab Region

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Arab Ministerial Council of for Meteorology & Climate

Arab Ministerial Declaration on Climate Change
CAMRE 2007

Arab Economic and Social Summit
Resolution on Climate C… & i…

Arab Perm…
…, 2015, 2016

ESCWA
25th … follow-up … 08, 2012, 2014

…ter Council
Resolutions 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017

ACSAD Board of Directors
Resolution 2013

2007 – 2017
10 Year Anniversary of Formalized Action on Climate Change at the Arab Regional Level

Environment | Foreign Affairs & Planning | Water | Met | Agriculture

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RICCAR Objective

To assess the impact of climate change on freshwater resources in the Arab Region through a consultative and integrated regional initiative that seeks to identify the socio-economic and environmental vulnerability caused by climate change impacts on water resources based on regional specificities.

RICCAR aims 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**

RICCAR Partnerships

Implementing Partners

UNITED NATIONS ESCWA

UN environment

WMO

ACSAD

LAS

SMHI

UNESCO Cairo Office
United Nations Educational, Scientific and Cultural Organization

UNITED NATIONS UNIVERSITY
UNU-INWEH

FAO

UNISDR
The United Nations Office for Disaster Risk Reduction

SWEDEN
SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

ACCWaM

Collaborating Research Institutes

- Center of Excellence for Climate Change Research/ King Abdulaziz University (CECCR/KAU) - *KSA*
- King Abdullah University of Science and Technology (*KAUST*) - *KSA*
- Climate Services Center 2.0 (CS2.0) - *Germany*

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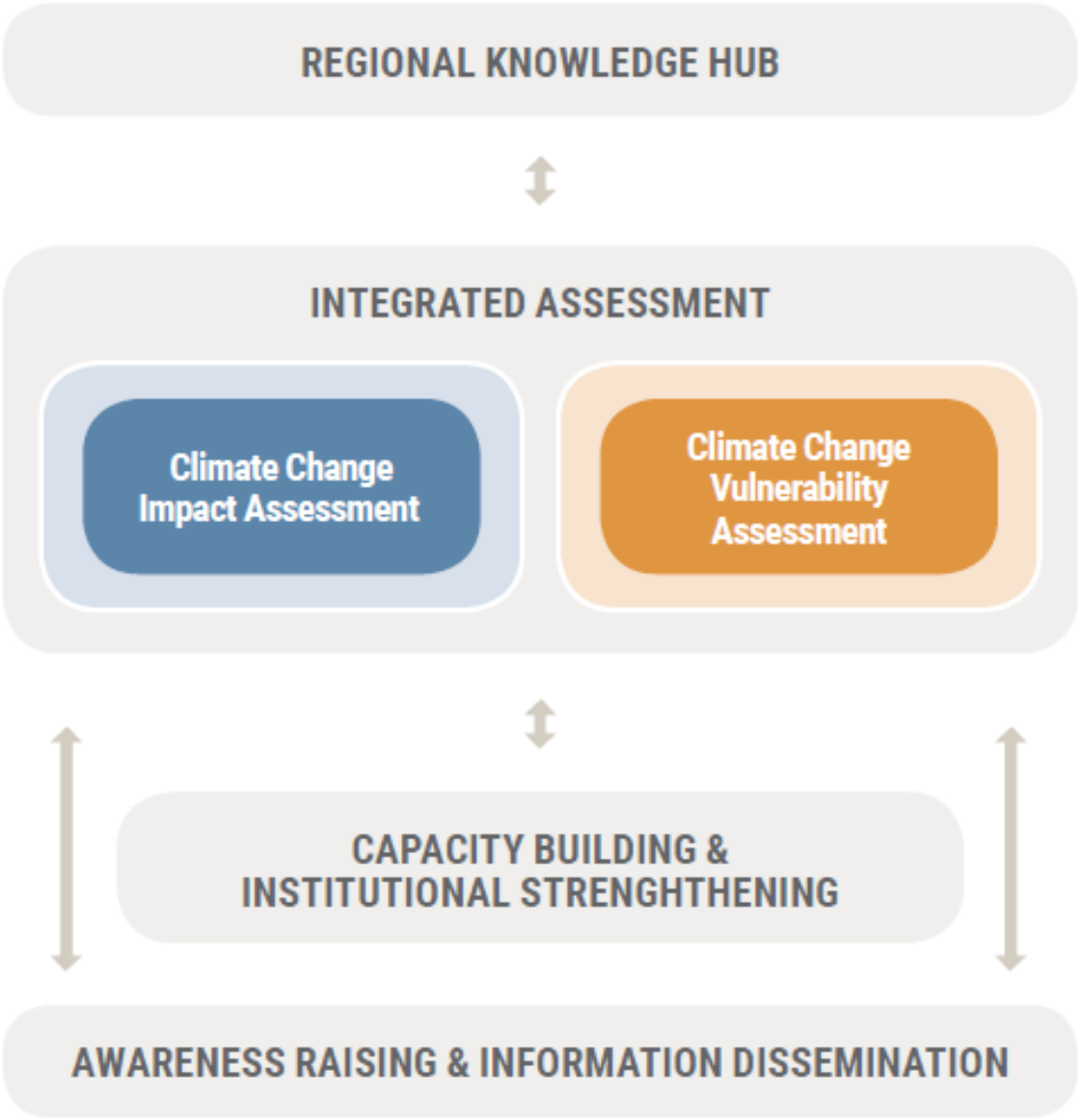
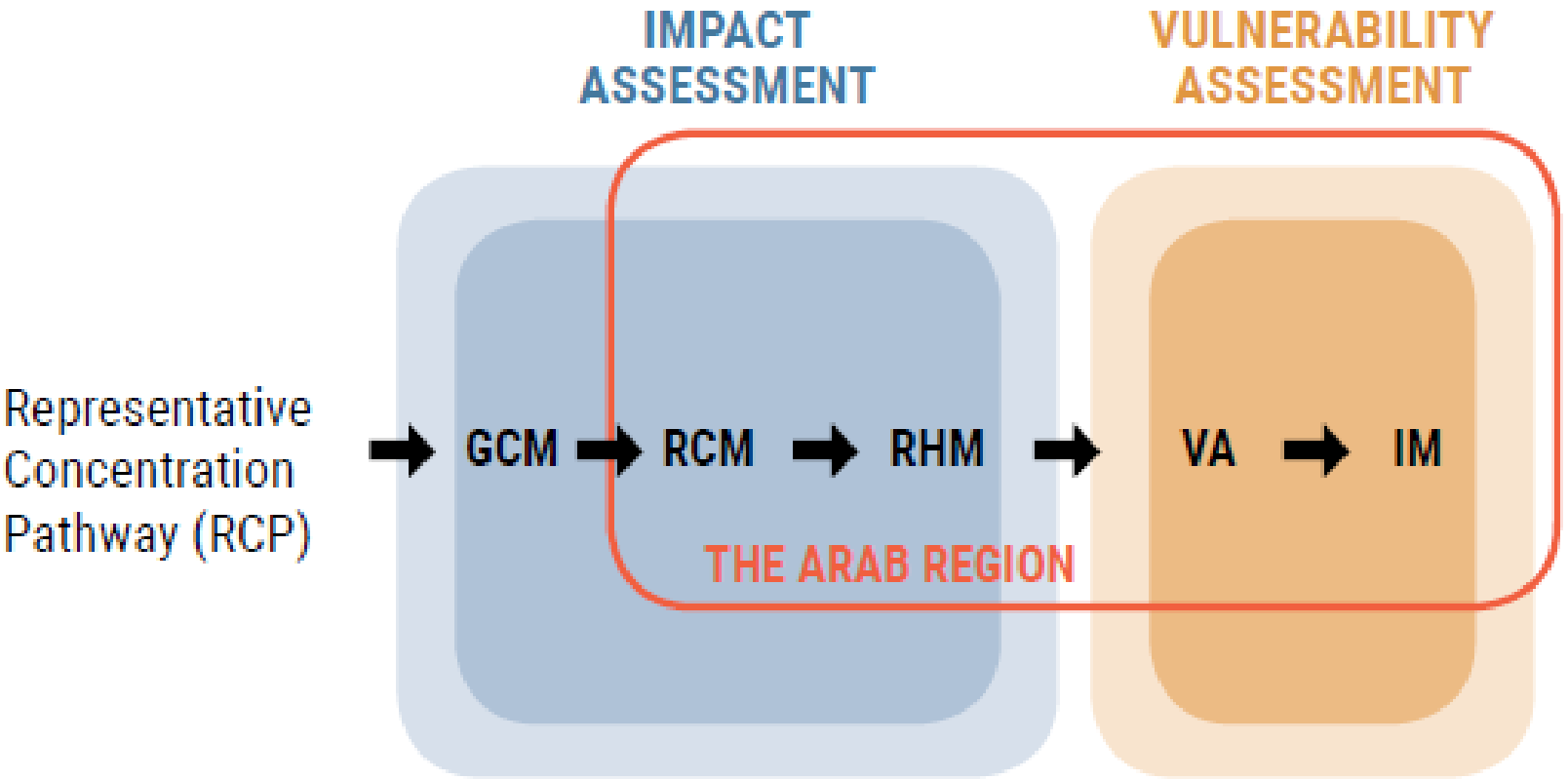
Pillars of Work



Integrated Assessment



GCM: Global Climate Modelling
RCM: Regional Climate Modelling
RHM: Regional Hydrological Modeling

VA: Vulnerability Assessment
IM: Integrated Mapping

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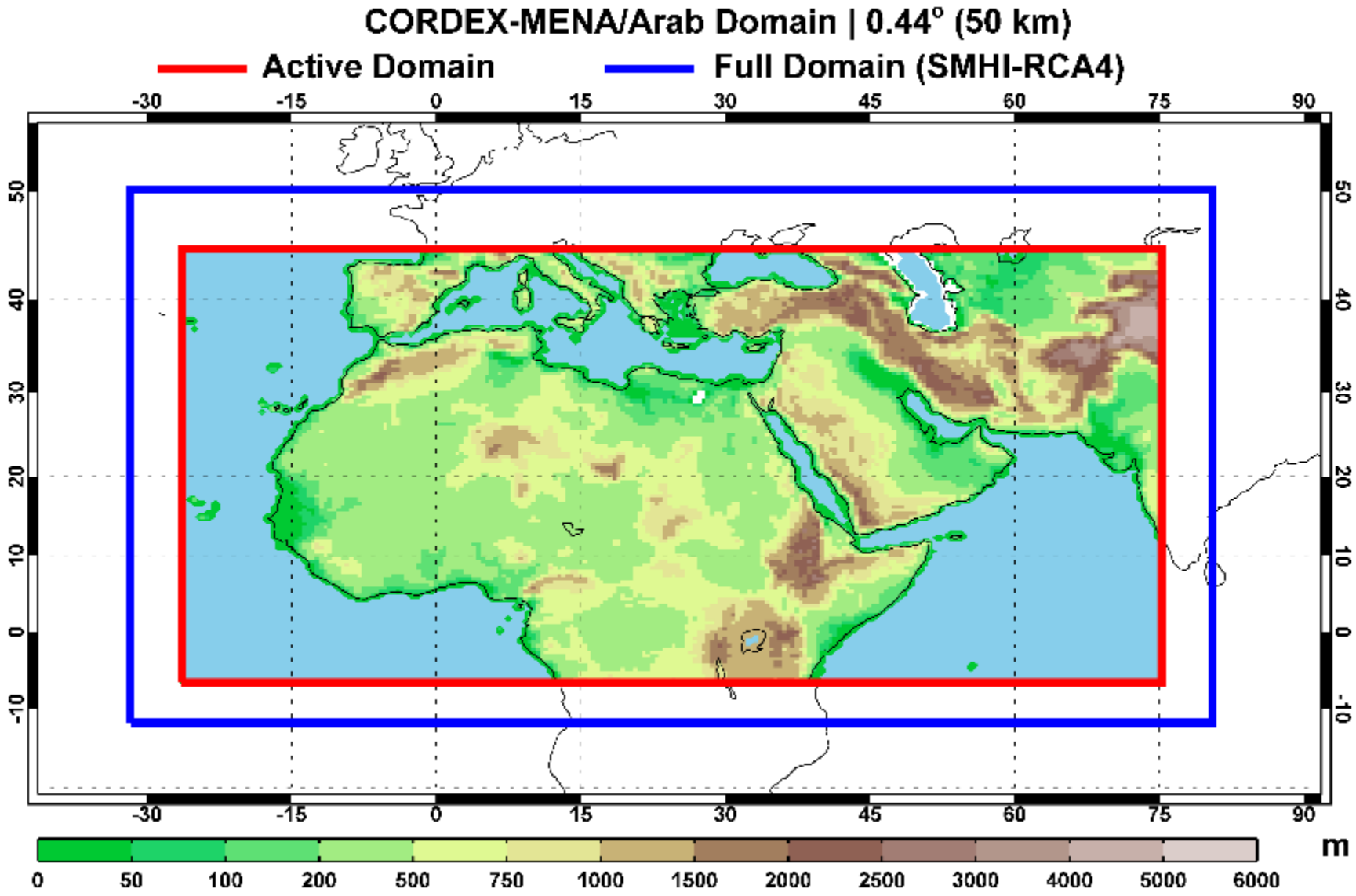
Arab Domain



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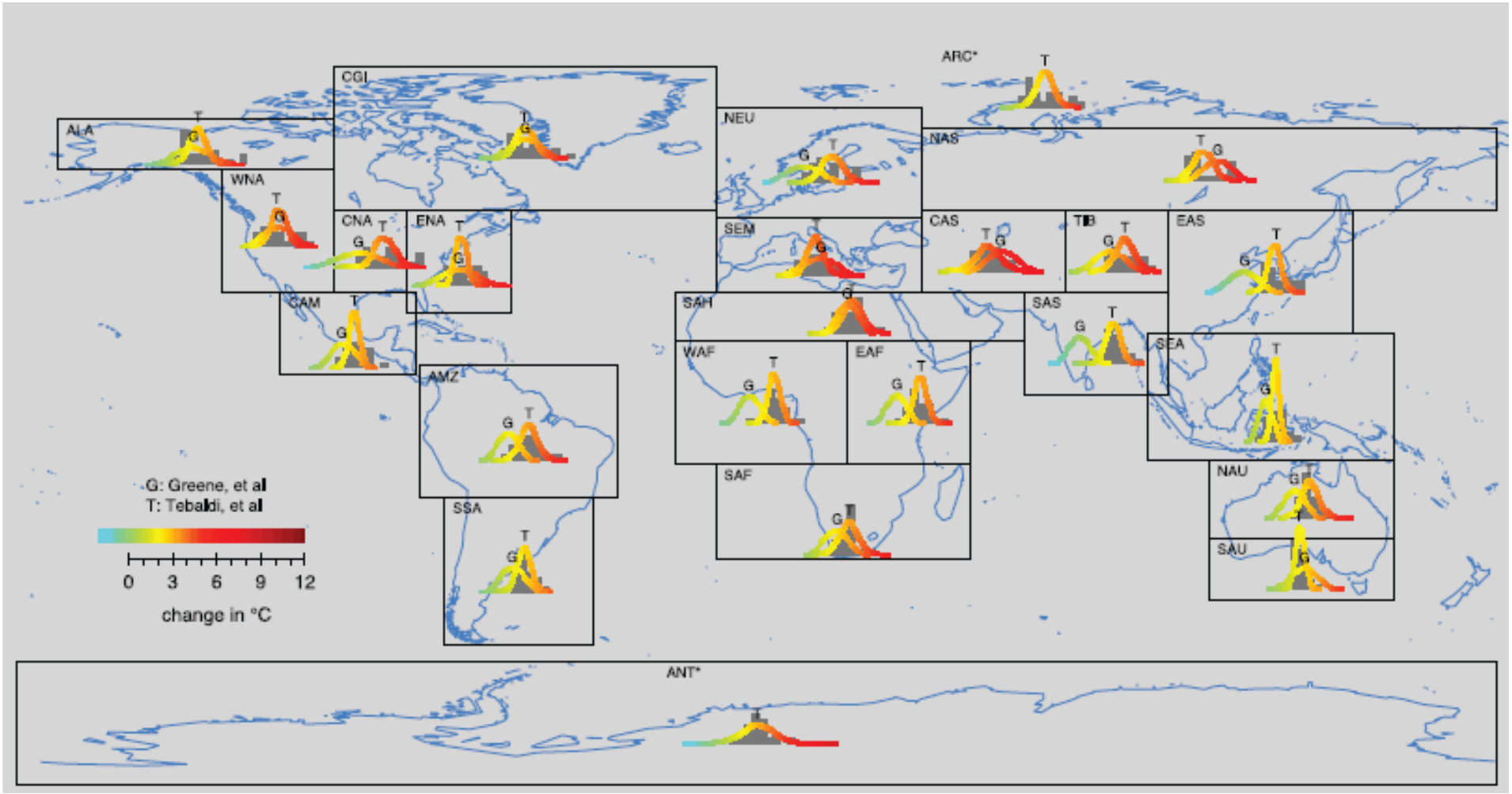
IPCC regional domains



From R.K Kolli, WMO
RICCAR EGM #2 (Beirut, 2010)

IPCC regional domains

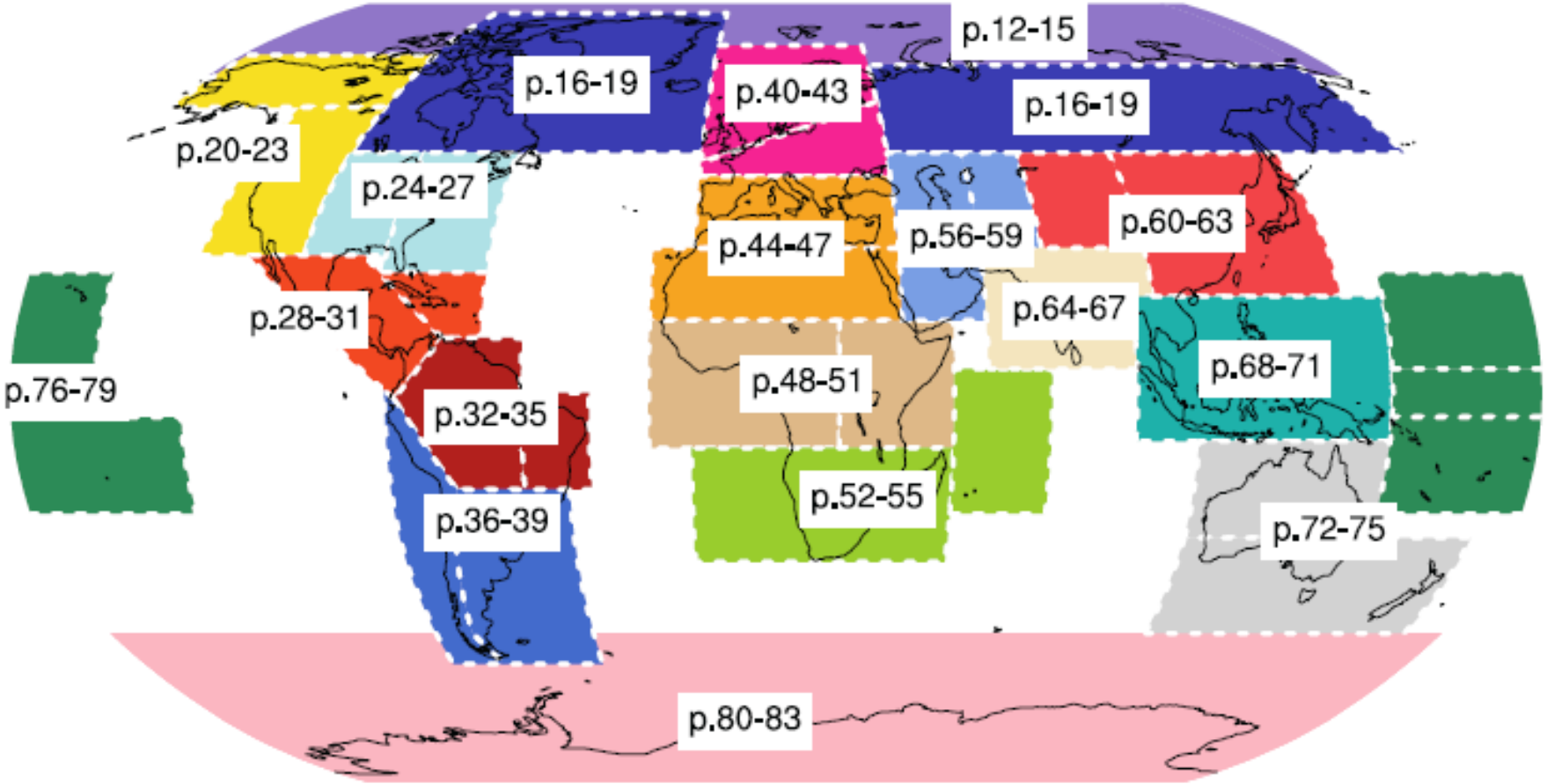


Figure AI.3: Overview of the SREX, ocean and polar regions used.

SREX: Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

IPCC Assessment Report 5 – WGI: Annex I
Draft: 30 September 2013

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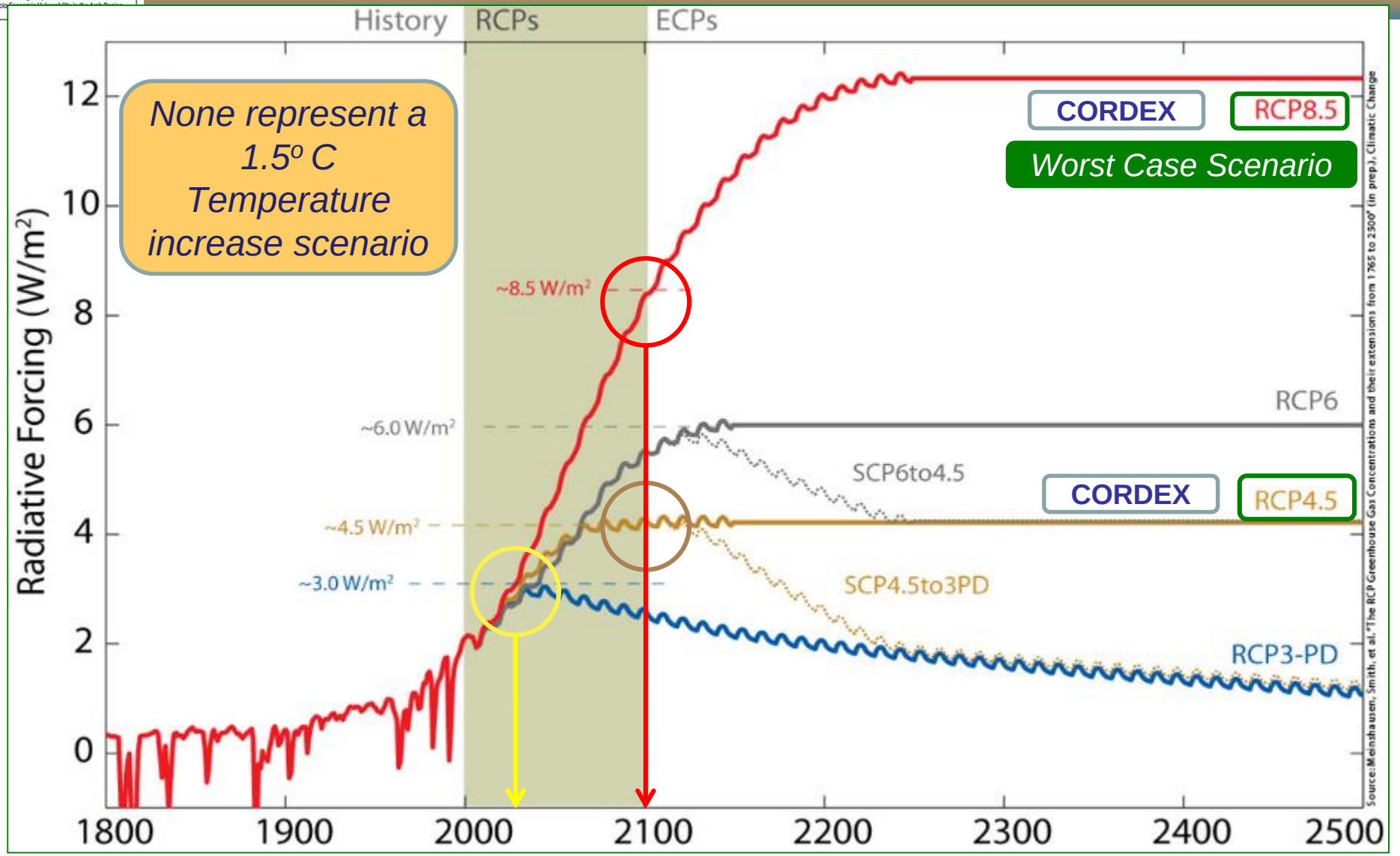
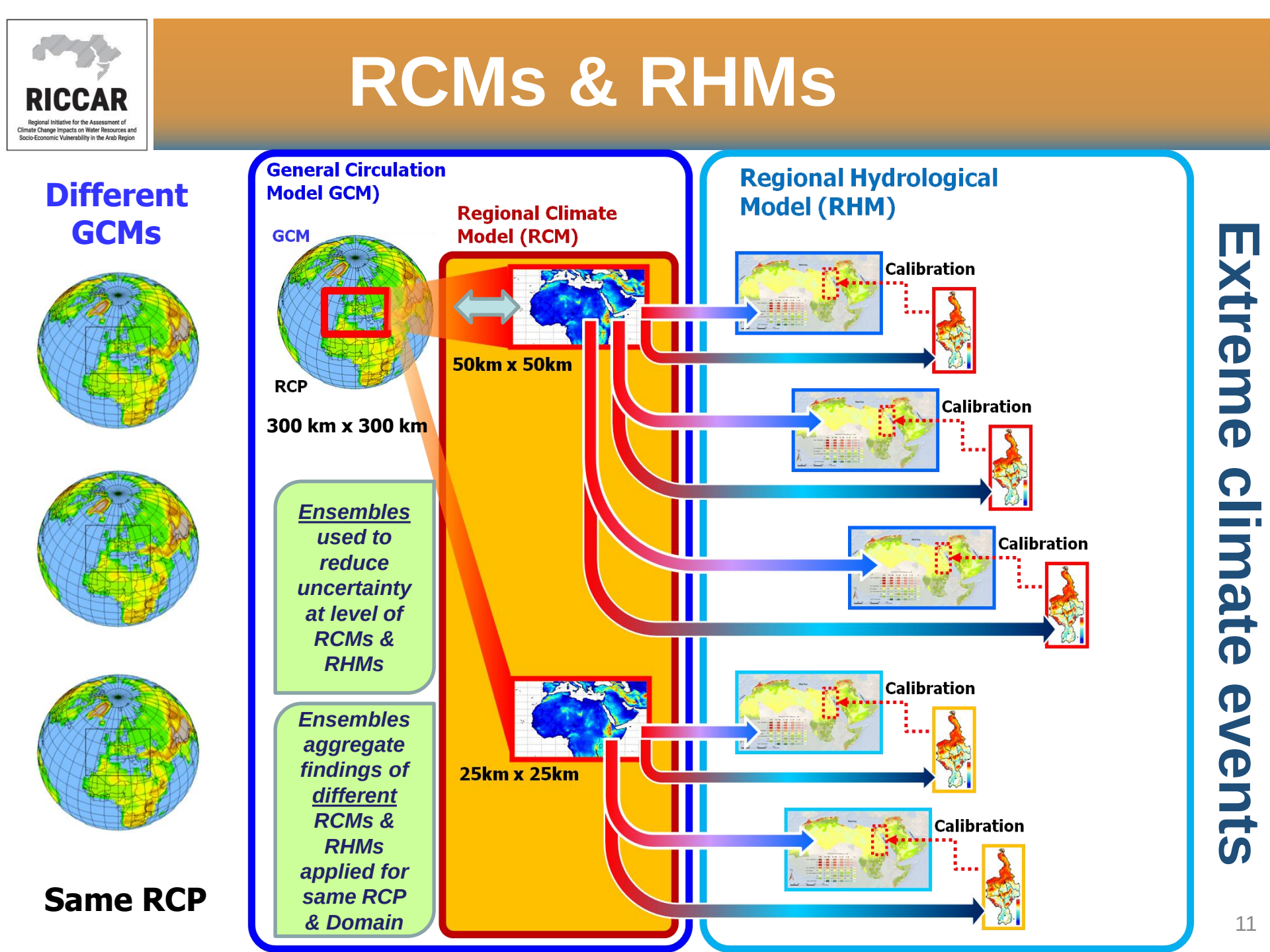
Representative Concentration Pathways (RCPs)

As first represented in IPCC AR5 Projections



Graph adapted from: Meinshausen et al.,2010

RCMs & RHMs


Different GCMs
Same RCP
General Circulation Model GCM)
GCM
RCP
300 km x 300 km
Regional Climate Model (RCM)
50km x 50km
25km x 25km
Regional Hydrological Model (RHM)
Calibration
Calibration
Calibration
Calibration
Calibration
Ensembles used to reduce uncertainty at level of RCMs & RHMs
Ensembles aggregate findings of different RCMs & RHMs applied for same RCP & Domain
Extreme climate events

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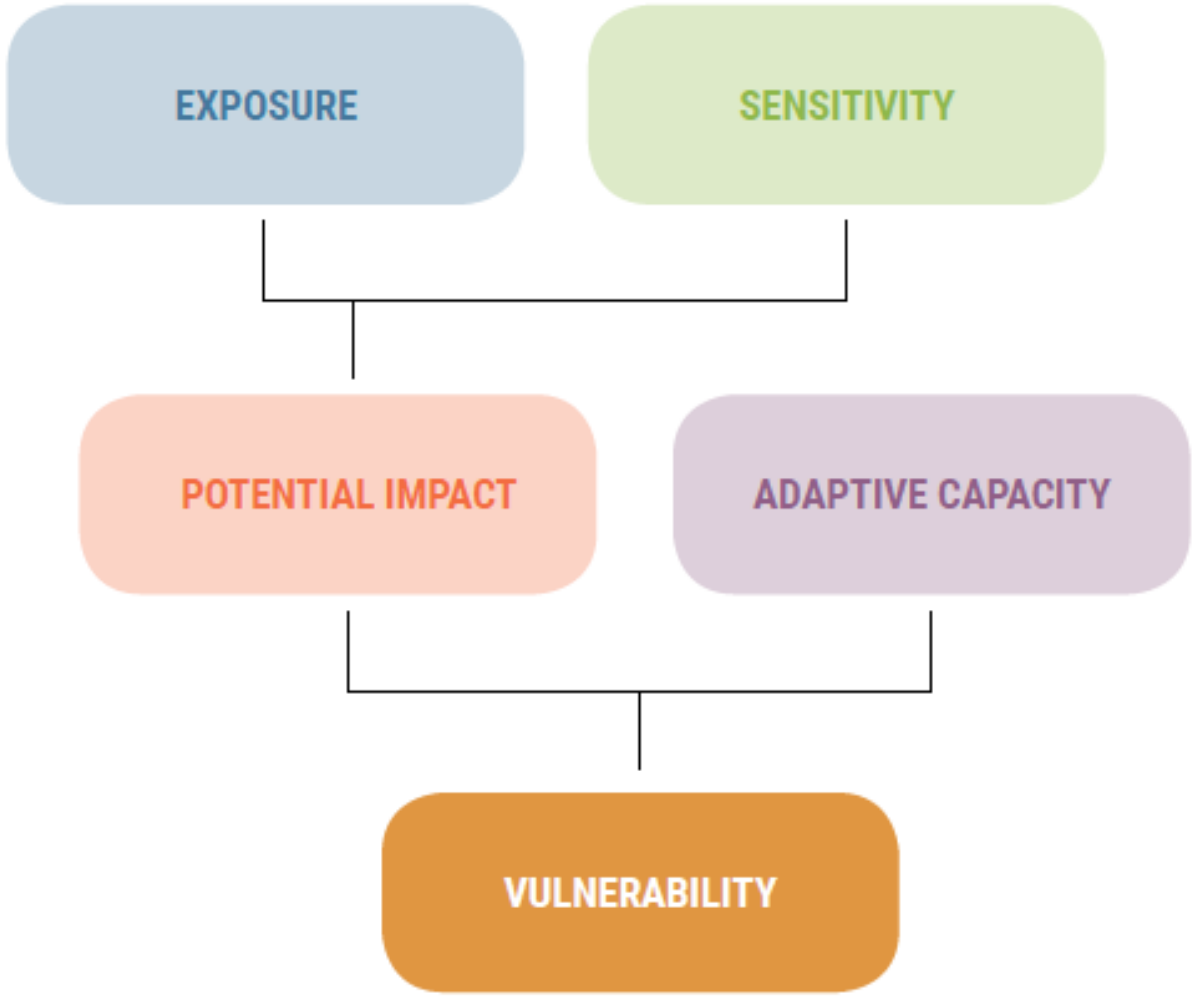
Vulnerability Assessment



Source: Based on IPCC, 2007

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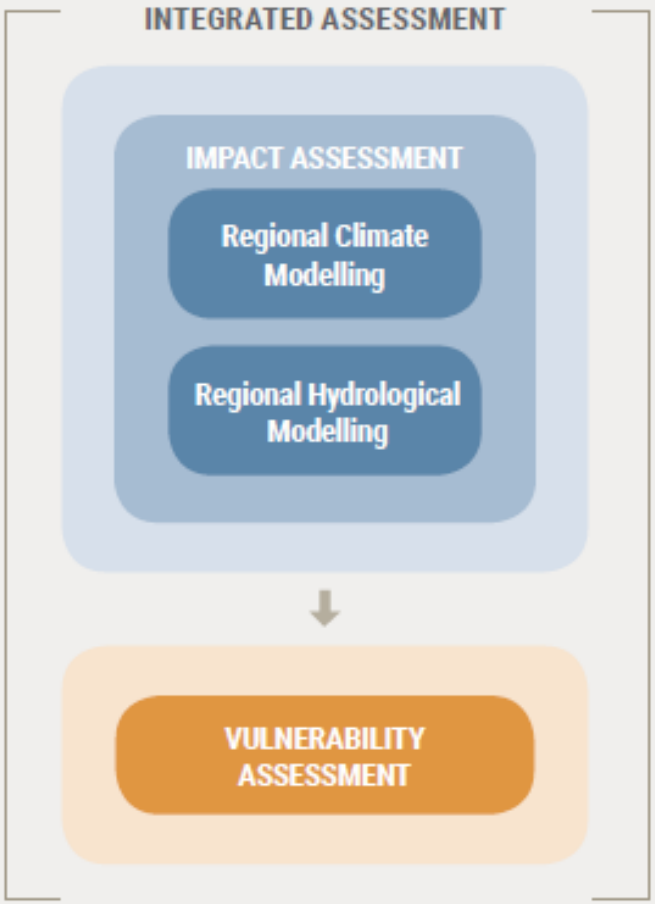
Consultations & Capacity Building



- **Annual Expert Group Meetings** (2009, 2010, 2011, 2012, 2013, 2014)
- **Technical Training Workshops** (2011, 2012, 2013, 2014, 2015)
- **Vulnerability Assessment Working Group** (2013 to 2015)
  Regional Knowledge Hub Working Group (2013 to 2014)
- **National Hydrological Focal Points** (2013, 2014, 2015)
- **Vulnerability Assessment Sensitivity Task Force** (2014)
  Vulnerability Assessment Adaptive Capacity Task Force (2014)
- **RCM Ensemble Task Force** (2011)
  CORDEX Working Group (2014)
- **Expert Peer Review Meetings** (April and December 2016)

Institutional Strengthening

- ***Increasing*** data availability through Climate Data Rescue
- ***Fostering*** an Arab Climate Outlook Forum
- ***Developing*** Disaster Loss Databases
- ***Establishing*** a Regional Knowledge Hub for informing policy & research through RICCAR Publication Series & Data Portal

Main Report

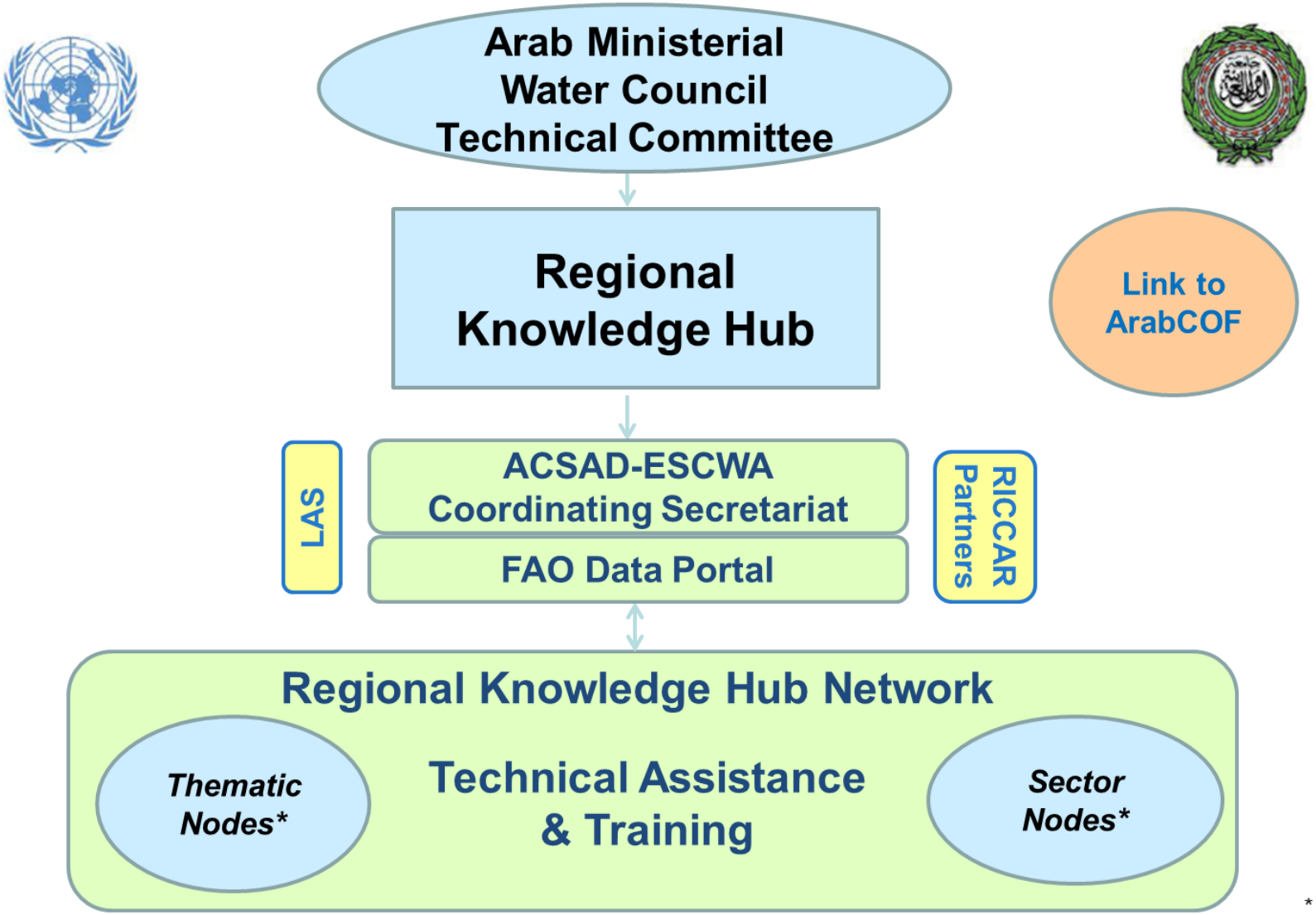
Technical Notes

Training Manuals

Technical Reports

Peer Reviewed Journal Articles for IPPC use

Regional Knowledge Hub



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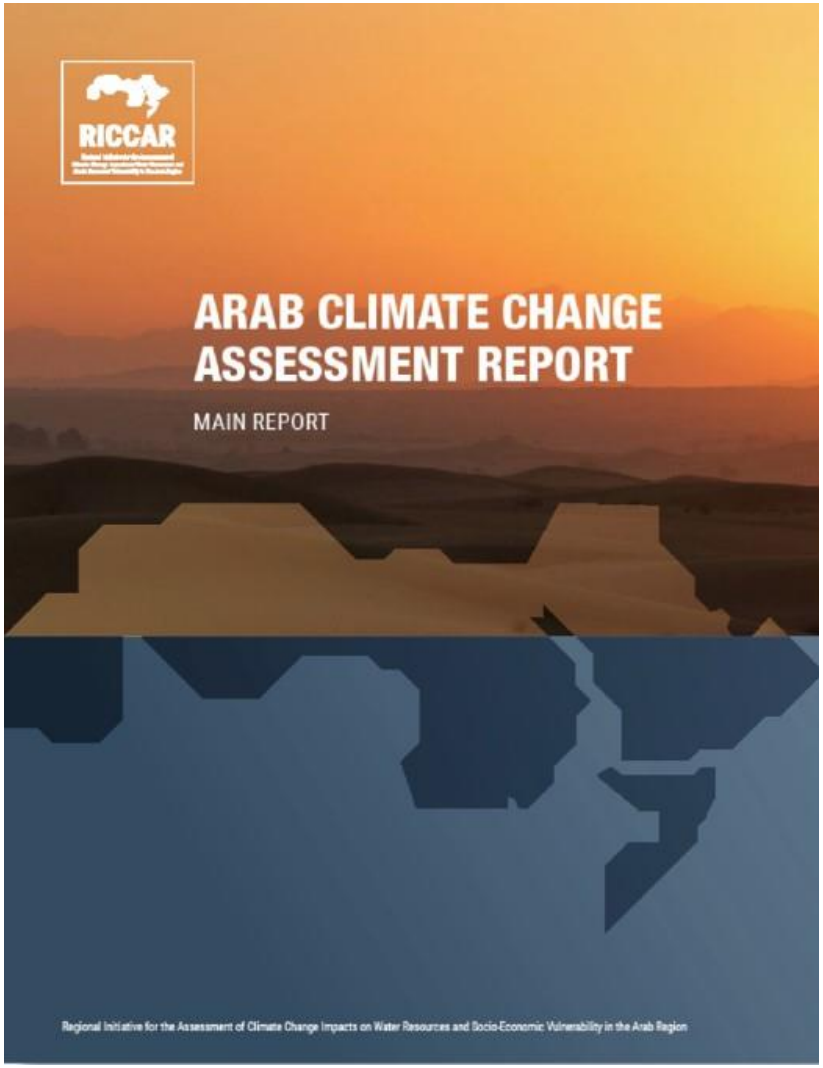
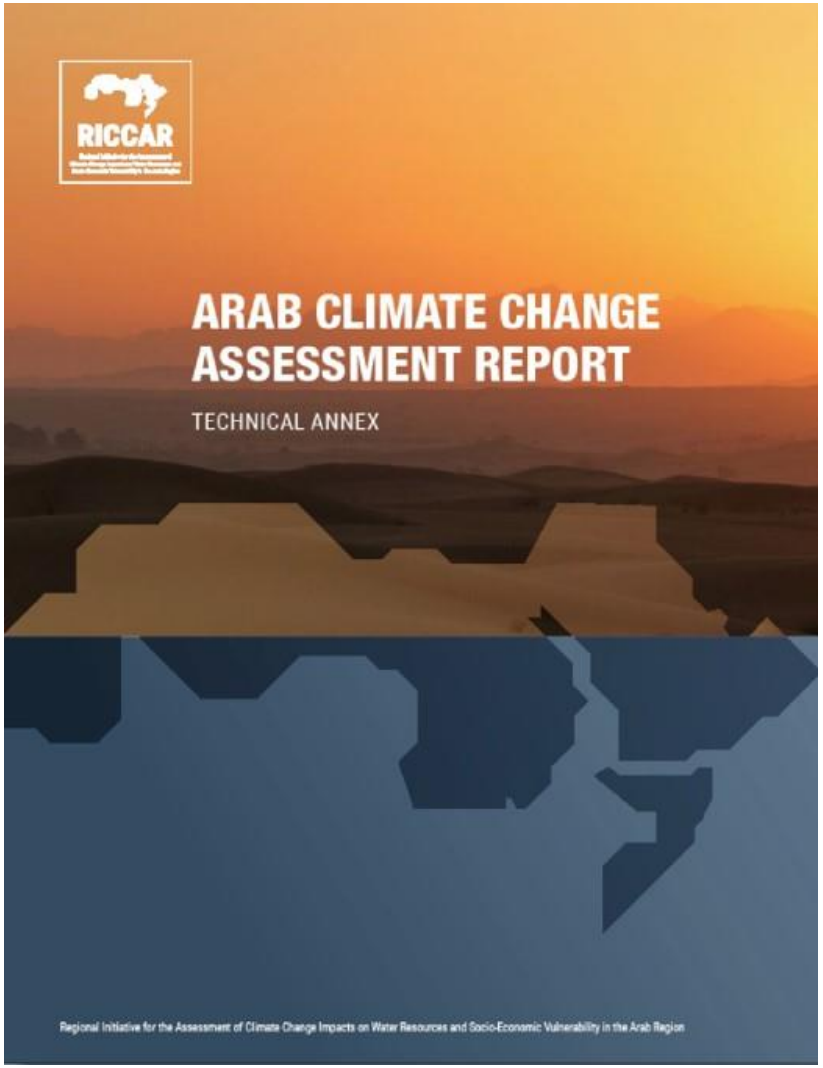
Report





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CHAPTER 4
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PART I. IMPACT ASSESSMENT

PART II. INTEGRATED VULNERABILITY ASSESSMENT

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Main Findings and Conclusions

1. The temperature in the Arab region is increasing and is expected to continue to increase until the end of the century.

2. Precipitation trends are largely decreasing across the Arab region until the end of the century, though limited areas expected to exhibit an increase in the intensity and volume of precipitation.

3. Extreme climate indices and seasonal projections provide valuable insights into climate change impacts, particularly at smaller scales of analysis.

4. Analysis of climate change impacts on shared water resources can benefit from regional and basin-level assessments.

5. Sector case studies enhance understanding of climate change implications.

6. Predicted vulnerability is largely moderate to high and exhibits a generally increasing gradient from north to south across the Arab region.

7. Both components of potential impact are important to consider when conducting vulnerability assessments.

8. Of the three components of the VA, adaptive capacity is most likely to influence vulnerability, suggesting that the ability of mankind to influence the future is stronger than that of climate change and environmental stressors.

9. Areas with the highest vulnerability, which have been defined as hotspots, generally occur in the Horn of Africa, the Sahel and the south-western Arabian Peninsula, irrespective of sector, subsector or projected climate scenario.

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Main Findings and Conclusions

10 Despite declining precipitation, areas with the lowest vulnerability relative to the region include the western Mediterranean, coastal Maghreb, and the coastal Levant due to higher adaptive capacity in this area compared to other parts of the region.

11 Even though the central Mediterranean coast and Green Mountains are subject to particularly strong warming, the area is indicative of moderate vulnerability due to relatively higher adaptive capacity, as compared to other parts of the region.

12 Despite precarious environmental, economic and social conditions within the lower Nile River Basin, the area demonstrates projected moderate vulnerability due to high adaptive capacity relative to other parts of the region.

13 Although the Euphrates and Tigris rivers face challenges due to demographic pressures, hydro-infrastructure developments and water quality degradation, socioeconomic vulnerability to climate change is found to be moderate relative to other parts of the region.

14 Despite remaining among the hottest areas in the Arab region, and signalling increasing temperatures, the Arabian Gulf generally projects moderate vulnerability to climate change.

15 Region-specific integrated vulnerability assessments can be drawn upon to inform regional cooperation, as well as basin level, country level and sector level analysis to advance understanding and collective action on climate change.

Thank You

www.unescwa.org/climate-change-water-resources-arab-region-riccar

www.riccar.org