CORDEX in South America &
Introduction to the new WCRP Core Project: Regional Information for Society (RIfS)

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CIMA (CONICET/UBA)

First Climate Research Forum in the South America Region, September 8 & 9, 2021
COordinated Regional Downscaling Experiment
CORDEX in South America

Silvina Solman and Daniela Jacob
CORDEX-SAT Co-Chairs
CORDEX Overview

The CORDEX vision is to advance and coordinate the science and application of regional climate downscaling through global partnerships

Goals:
- To better understand relevant regional/local climate phenomena, their variability and changes, through downscaling
- To evaluate and improve regional climate downscaling models and techniques
- To produce coordinated sets of regional downscaled projections worldwide
- To foster communication and knowledge exchange with users of regional climate information

- CORDEX directly contributes to the new WCRP strategic plan, especially Pillar 4: “Bridging climate science and society”
- CORDEX is an instrumental part of the Regional Information for Society (RifS) WCRP New Core Project
CORDEX Structure

CORDEX includes 14 domains, regions for which regional downscaling is taking place and which have an official CORDEX designation.

- 12 members with Daniela Jacob and Silvina Solman as co-chairs; members are appointed for a 4-year term, with the possibility of 2-year extensions.
- Reports regularly at the JSC meetings on the progress of its activities (on yearly basis).

- 44 members (POCs)
- Reports annually to the SAT and CORDEX Project Office on current and future activities

- The IPO for CORDEX (IPOC) is hosted by SMHI with Iréne Lake as Director
CORDEX: Primary science issues

- Convection permitting resolution to inform risks/Vulnerability, Impacts, Adaptation and Climate Services communities (VIACS)
- RESMs to include human dimension
- Handle increasing data amounts
- Merge Dynamical Downscaling with ESD

Flagship Pilot Studies
- Regional-to-local extremes
- Third pole region
- Convection permitting
- Land use change
- Urban areas
- Aerosols

CMIP6 Downscaling protocol

Capacity building activities
- Regional training workshops
CORDEX data availability (input for IPCC AR6 CH6/Atlas)

- CORDEX model output data is available online via:
  - Earth System Grid Federation
  - Copernicus Climate Data Store

- Open access
- Standardized, quality controlled
- Observational basis for verification
- Community effort
- Inventory of GCM/RCMs on www.cordex.org
### Summary of CORDEX SAM simulations available

- **37 simulations**
- **8 RCM + 12 driving GCMs**
- **3 RCPs + historical + evaluation simulations**
- **Horizontal resolutions ranging from 20km to 50 km**

#### Table of CORDEX SAM simulations:

<table>
<thead>
<tr>
<th>Domain</th>
<th>GCM_run</th>
<th>RCM</th>
<th>Evaluation</th>
<th>Historical</th>
<th>RCP2.6</th>
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</table>
CORDEX South America (SAM): Activities

FPS-SESA: Extreme precipitation events in Southeastern South America: a proposal for a better understanding and modelling (2016-2021)

http://cordexfpssesa.at.fcen.uba.ar

Scientific Meetings

- Second Workshop on CORDEX-FPS South America, Sao Paulo, Brazil, 6-7 Nov. 2018
- First Workshop on CORDEX-FPS South America, Sao Jose dos Campos, Brazil, 23-24 March 2017.

Total precip 2009/2010: Obs, RCMs (20km & 4km), ESDs

Bettolli et al. 2021, DOI: 10.1007/s00382-020-05549-z;
Lavin-Gullon et al. 2021, DOI: 10.1007/s00382-021-05637-8
CORDEX South America (SAM): Activities

Capacity building Activities

- CORDEX SAM & CAM Writing Workshop (2020 & 2021) – virtual (45 participants)
- CORDEX Central America and South America Training Workshop on Downscaling Techniques (2018) – Bolivia (30 participants)
- Second ICTP Advanced School on Regional Climate Modeling and Extreme Events over South America, Sao Paulo, Brazil, 5-9/11 2018

CordexLac mailing list

cordexlac_list@cima.fcen.uba.ar

Up to 150 members from South and Central America, the Caribbean and Latin America
CORDEX South America (SAM)

CORDEX SAM Points of Contact

Dynamical Downscaling
• Silvina Solman - Universidad de Buenos Aires, Argentina  solman@cima.fcen.uba.ar
• Rosmeri Porfirio da Rocha - University of Sao Paulo, Brazil  rosmerir@model.iag.usp.br

Statistical Downscaling
• Maria Bettolli - Universidad de Buenos Aires, Argentina  bettolli@at.fcen.uba.ar
Introduction to the new WCRP Core Project: Regional Information for Society (RIfS)

Silvina Solman, Sara Pryor and Bruce Hewiston
RIfS Co-chairs
RIfS: Context

WCRP Strategic Plan for the next decade

New WCRP CORE Project RIfS

Goal: Pursue strong integration across the WCRP and add value by providing regional information that meets societal needs.

Scientific Objectives

1. Fundamental understanding of the climate system
2. Prediction of the near-term evolution of the climate system
3. Long-term response of the climate system
4. Bridging climate science and society

Overview of the WCRP Strategic Plan

- A hierarchy of simulation tools
- Sustained observations and reference data sets
- Need for open access
- High-end computing and data management
RIfS: Brief History

- Following JSC 41: Task Team on Regional Activities (TTRA)
  - To propose structures and develop a concrete work plan
  - Initial dialogue of the TTRA + WGRC + CORDEX

- Interim Coordinating Group (ICG), 3 co-chairs (1 from CORDEX)
  - Working Group on Building Blocks (WGBB)
  - Governance planning committee

- Dec. 2020
- June 2021 - on going

- May 2019
- Early 2021

- JSC-41b
  - TTRA recommends new Home “RIfS”

- Mission and Vision, Science plan, Structure and IPO

Excellent global participation
- Planning meeting in March had over 50 participants
- 18 RIfS virtual planning meetings held since the end of April
**RIfS: Strategic goals and outcomes**

**Objective:** Enhance societal value of regional climate information

**Core principles:** Facilitate and catalyze research for actionable information.

- Undertake this through research on:
  - Integrating the best available science
  - Incorporating decision contexts
  - Engaging within a co-creation/co-production framework

**Science foci:** Research questions relevant to regional information about the physical climate system, co-production, social sciences, communication, ethics and values.

**Foci include:**

- Understanding climate drivers of regional climate variability and change related to impacts
- How to better integrate across the approaches to producing climate information
- Learning from society’s decision makers, policy communities, and other stakeholders to enhance physical climate science research agendas and activities
RIfS: Science Plan and Desired outcomes

Seeks to advance:

- Understanding of the stakeholder and climate services landscape
- Dialogue with stakeholders on context-relevant climate information
- Assessment and articulation of skill and uncertainty in regional predictions/projections.
- Approaches to the integration and construction of regional information
- Identification and understanding of multi-scale climate drivers of regional risk

Desired outcomes include:

- Enhanced reduction of systemic risk to climate change and variability
- Clear and sustained dialogue with major users that is regionally context relevant
- Improved understanding to develop and deliver context-dependent climate science
- Increased collaboration within and beyond the WCRP in relevant knowledge co-production.

CORDEX is a core component of RIfS
### RIfS: Structure

<table>
<thead>
<tr>
<th>1. RIfS Internal Board (IB) <em>(Includes the role of a scientific steering committee (SSC))</em></th>
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<tbody>
<tr>
<td>• Selected from nominations to ensure of:</td>
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<tr>
<td>• Geographic, gender and age balance</td>
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<tr>
<td>• Expertise spanning the RifS core themes</td>
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<td>• 15 members with additional ex-officio attendance by partners</td>
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<tr>
<td>• 3 co-chairs with expertise to span the full RifS agenda. Co-chairs nominated by the RifS internal board for approval by the JSC (1 co-chair must be from CORDEX community)</td>
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<tr>
<th>2. Assembly of allied WCRP Core and Lighthouse representatives <em>(established by IB)</em></th>
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<td>• Focused on enabling cross-cutting collaboration around regional climate information</td>
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<tr>
<td>• Point of communication from RifS engagement with external partners</td>
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<tr>
<td>• 2 Nominated members from each WCRP core project or LHA</td>
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<tr>
<th>3. External board with regional representatives and stakeholders <em>(established by IB)</em></th>
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<tr>
<td>• Applications to be solicited using the widest possible network of external organizations</td>
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3. Partnerships

To meet our overarching goals RIfS will

- Include social scientist and communication specialists
- Proactively engage with both the climate service and VIA communities
- Target initial pilot regions to catalyze joint activities and develop community interfaces
- Open discussion with appropriate regional activities and organizations

4. Requirements

RIfS is exploring ideas for external resources (e.g. Bezos Earth Fund, Belmont Forum).
Questions?