

Current status of operations of RCC-Network for Southern South America

RCC-Network SSA

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World Meteorological Organization
Organisation météorologique mondiale

**WMO International Workshop on Global
Review of RCC Operations, Pune, India,
12 – 14 November 2018**

RCC-Network SSA: domain



The spatial domain of RCC-Network SSA includes the full territories of Argentina, Bolivia, Chile, Paraguay and Uruguay, and the portion of Brazil south of 10°S.



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RCC-Network SSA: Structure

Involves the following institutions:

Responsible countries: Argentina and Brazil, through their National Meteorological Services (SMN and INMET).

Participant or partner countries: Bolivia, Chile, Paraguay and Uruguay, through their NMHS.

Collaborating institutions: Institutes and University Departments dedicated to Climate studies and services, e.g.: SIMEPAR (Brazil), CPTEC (Brazil), DCAO-UBA (Argentina), CIMA (Argentina), Facultad de Agronomía (UBA, Argentina), INTA (Argentina)

RCC-Network SSA: Governance

- a. **Executive Committee** (EC): is formed by the Directors of the NMHSs of the coordinating and partner countries. Since September 2018 and for the next two years, Dra. Celeste Saulo (PR Argentina) is the Chair of the EC.
- b. **Working Groups:** permanent and ad hoc working groups. At present, there are four Permanent Working Groups (PWGs):
 - i. PWG-1: Data management and products development and production;
 - ii. PWG-2: IT Infrastructure, Web design and maintenance;
 - iii. PWG-3: Training and capacity building; and
 - iv. PWG-4: Associated research activities including the mechanics of interfacing with users.

Brazil leads the production of seasonal forecasts, and Argentina leads topics related to data compilation and quality control, and diagnostic information.



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RCC-Network SSA

The RCC-Network-SSA started its demonstration phase on 21 May 2014 and it was formally approved as a RCC on May 2017 (Nov 2016 CBS).

Infrastructure

The only infrastructure operated by the RCC is one server at each of the coordinating institutions (SMN and INMET), where mirrored copies of the RCC's web site and climate database are located.

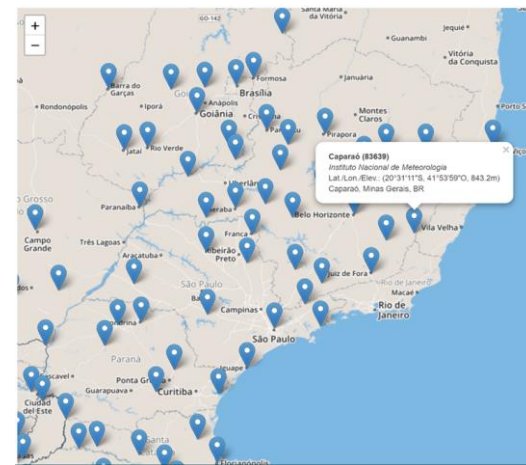
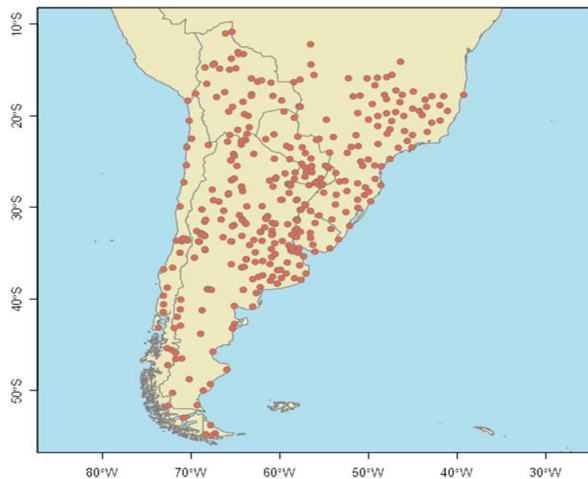
RCC-Network SSA: Mandatory Functions

1. Operational Data Services

Regional database

The RCC-Network-SSA has a database of daily data.

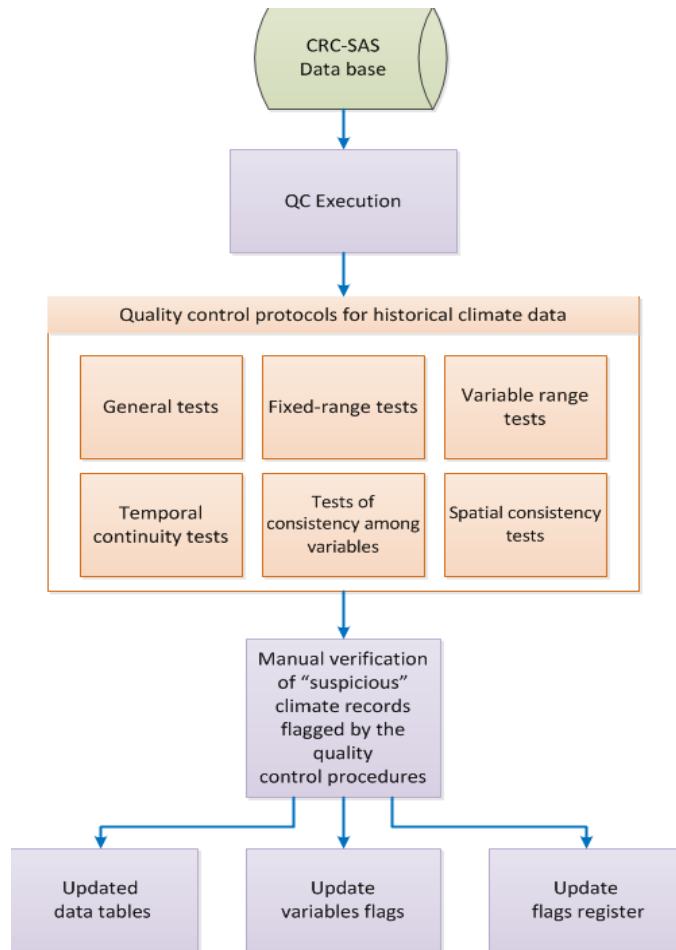
- Includes 356 conventional stations.



http://www.crc-sas.org/en/red_estaciones_meteorologicas.php

- Data start on January 1961 to present.
- Variables: maximum and minimum temperature, precipitation and some institutions have contributed additional variables (e.g.: wind)
- The data are updated regularly: most countries automatically send daily updates to the RCC's database

RCC-Network SSA: Database



A Quality Control (QC) protocol was defined by all countries.

All tests are implemented in free, open-source R. The R code was shared with the members of RCC

The test can be grouped into six major "families", ei, general tests, spatial tests

Details of qc are documented in a Technical Report :

http://www.crc-sas.org/es/pdf/reporte_tecnico_CRC-SAS-2014-001.pdf

RCC-Network SSA: Database

Manual verification is made by each country through a web interface developed to facilitate verification.



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Centro Regional do Clima para o Sul da América do Sul
Fase demostración



- Estaciones
 - Verificación
 - Descarga datos
- Reportes
 - Resumen
 - Actualizaciones
 - Metadatos
- Climatología
 - Normales
- Indices CLIMDEX
 - Situación actual
 - Histórico
 - Ayuda
- Indices de sequía
 - Eventos
 - Mapa
 - Mapa de calor
 - Panel
 - Rankings
 - Series
 - Ayuda
- Salir

Estaciones - Verificación - [87289] Paso de los Libres Aero (Corrientes, Argentina) - Institución: SMN

Variable actual
Editar

Variables dudosas
<< >>

Todas las variables
< >

Registros
Volver

Ayuda
?

Variable: Temperatura máxima
Tests fallados: CES_01
Estado: Sospechoso
Valor: 31.1 °C

Fecha	tmax	tmin	tmed	td	pres_est	pres_nm	prcp	hr	helio	nub	vmax_d	vmax_f	vmed
2015-12-15	30.3	19.3	24.0	19.5	1005.0	1013.1	0.0	77	11.3	4	20	12.9	5.0
2015-12-16	29.5	18.5	25.2	16.9	1004.9	1013.0	0.0	61	12.2	1	9	15.4	7.8
2015-12-17	34.5	21.7	26.9	22.5	997.0	1005.0	49.0	78	3.9	4	36	18.0	4.8
2015-12-18	25.0	20.1	22.1	21.0	998.8	1006.9	5.0	94	0.4	7	27	24.2	4.6
2015-12-19	27.3	19.1	22.5	16.0	1006.4	1014.6	0.0	68	7.8	6	14	13.9	5.8
2015-12-20	28.3	19.2	23.3	18.3	1006.4	1014.6	0.0	74	11.3	4	9	14.4	6.2
2015-12-21	26.3	21.1	22.7	21.0	1001.2	1009.3	74.0	91	1.3	6	9	17.0	7.5
2015-12-22	31.1	20.6	23.8	22.3	998.5	1006.6	83.0	92	2.0	8	14	21.6	8.1
2015-12-23	22.7	20.2	21.6	20.4	1000.2	1008.3	33.0	94	0.0	8	9	20.6	5.3
2015-12-24	28.5	20.0	23.8	21.6	1004.3	1012.5	0.0	88	2.9	8	9	18.5	3.3
2015-12-25	28.5	20.0	24.5	21.2	1006.1	1014.2	0.0	83	2.2	6	14	11.3	4.2
2015-12-26	28.9	21.0	24.8	21.8	1002.4	1010.5	0.0	84	3.8	6	14	8.7	3.6
2015-12-27	32.5	22.8	27.8	23.1	998.7	1006.7	0.0	77	10.4	5	14	6.7	2.3
2015-12-28	31.8	24.2	27.9	24.7	998.9	1006.8	0.0	83	0.5	7	11	8.2	3.6
2015-12-29	28.2	22.3	26.7	24.7	998.7	1006.7	21.0	89	0.0	8	34	15.9	4.1



Referencia de colores:

- C Registro actual / Estación central (en mapa)
- Otro registro / Estación vecina (en mapa)
- Dato válido
- Dato sospechoso
- Dato no válido / no corregible



Banco Interamericano de Desarrollo



Inter-American Institute for Global Change Research



United States National Science Foundation

RCC-Network SSA: 2. Climate Monitoring

Climate monitoring is performed through different diagnostics as mean, anomalies, indices, computed at multiple temporal scales generally from one month to a year for all region

- Precipitation and temperature maps from 1 to 12 months
- Monitoring by city, includes daily/monthly temperature and precipitation
- Maps of monthly, seasonal and annual mean values of temperature and precipitation for 1981-2010.
- Values and maps of lower and upper terciles (1981-2010)
- Values and maps of extremes for 1-month and 3-months
- Monitoring and trend of climate extreme indices (ETTCDI)
- Monthly report about El Niño/ La Niña

All products are made from information available through the RCC-SSA database. To improve the spatial coverage, for precipitation, there are diagnostics based on satellite imagery, ej EMERG, CHIRPS.

Most of the products are updated monthly. A few products are updated every 5 or 10 days

RCC-Network SSA: 2. Climate Monitoring

- Drought/rainfall excesses monitoring
SPI, SPEI, Decil, percentage anomaly, quantiles.
Output type: time series, maps, tables, panels. Data and graphs are available to download

Drought indices - Indices map by country and station

Country:

Data:

Year: Month:

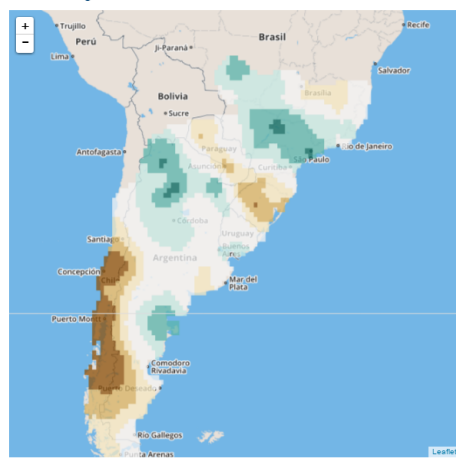
Index: Time scale:

[Download RASTER](#)

References:

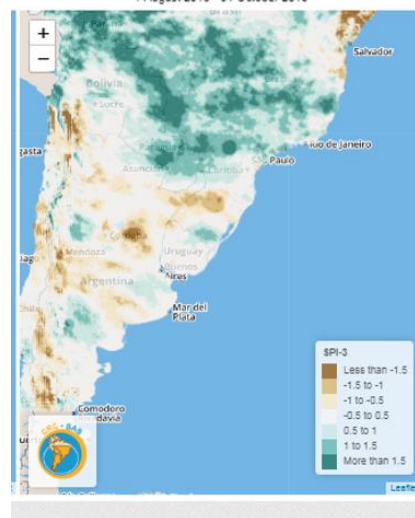
- Extreme drought
- Severe drought
- Moderate drought
- Normal
- Moderately wet
- Severely wet
- Extremely wet
- No data for this period

SPI-3 for August 2016



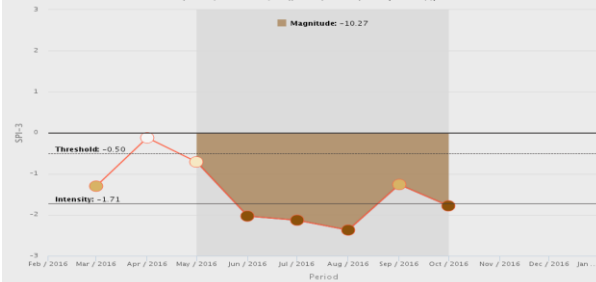
SPI-3 of total precipitation (1982-2016)

1 August 2018 - 31 October 2018



SPI-3: Bernardo O'Higgins, Chileán Ad., CL (85672)

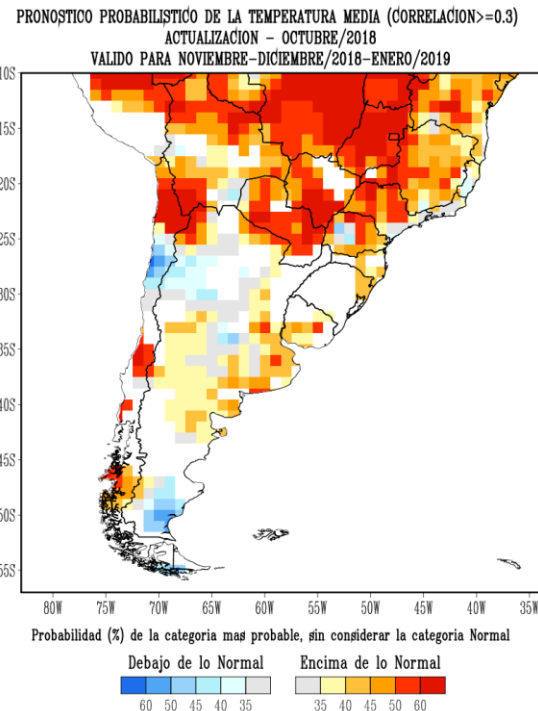
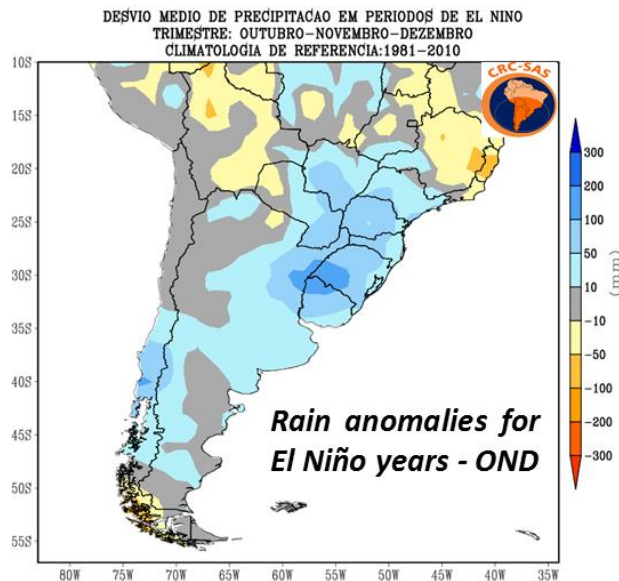
Dry event SPI-3 < -0.50; May, 2016 / October, 2016 [6 months]



RCC-Network SSA: 3. Long Range Forecasting

Main sources of predictability: El Niño Southern Oscillation (ENSO), the Indian Ocean Dipole, the Sea Surface Temperatures in the Atlantic, the Southern Annular Mode, the Madden-Julian Oscillation.

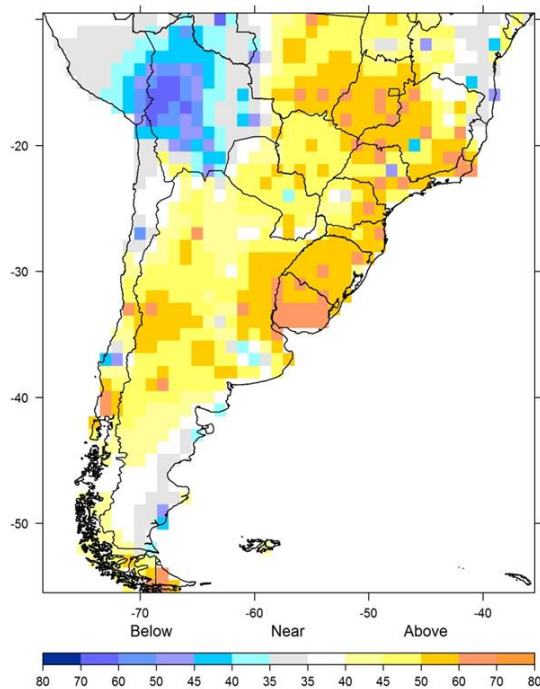
Statistical seasonal forecast is made using the Climate Predictability Tool (CPT). Forecast for temperature and precipitation is expressed with mean values and probabilities by tercile categories. Provide the map of anomaly correlation.



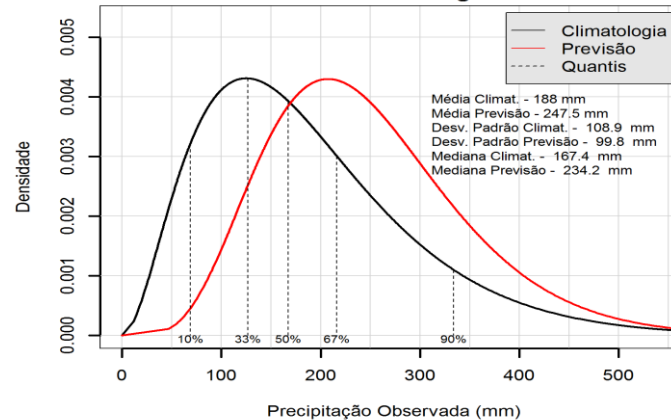
RCC-Network SSA: 3. Long Range Forecasting

Seasonal forecast based in North-American-multi-model-ensemble (NMME) was implemented using CPT. This products is ready for to be included in the RRC-SSA web-site. The implementation was made in collaboration with professionals from the University of Alagoas

Temperatura Média - Previsão de Probabilidades
Trimestre Julho-Agosto-Setembro/2018
Realização: Junho/2018



Função de Densidade do Trimestre
JAS de 2018 para a Estação 86218
Asunción - Paraguai



RCC-Network SSA: 3. Long Range Forecasting

Monthly, individual GPC and LC-LRFMME forecasts are consulted and interpreted by RCC-SSA personal

Consensus outlooks are developed through the subjective integration by regional experts of the outputs produced by both statistical and dynamical forecasting approaches.

RCC-Network SSA: 4. Training/Guidance in the use of RCC products

- Four workshops have been organized by RCC-SSA between Dec 2013 and dic 2017 (quality control, drought and seasonal forecast).
<http://www.crc-sas.org/es/cursos.php>
- Two contribution to training session on RCOF (sub seasonal forecast and sesonal forecast)
- we collaborated with the organization of the Ibero-American Regional Climate Services Workshop .
- Short stays of technicians from countries in the region (e.g Paraguay's staff visited Argentina site to improve use of RCC products)

RCC-Network SSA: 4. Training/Guidance in the use of RCC products

Technical reports were produced describing :

- (i) design and compilation of a regional climate database (sp),
- (ii) procedures for the quality control of the regional database (sp),
- (iii) homogenization approaches, (SP)
- (iv) calculation of various indices for drought monitoring (sp)
- (v) Towards a Drought Information System for South America (en)



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Towards a Drought Information System for South
America

A Strategic Plan

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http://www.crc-sas.org/es/guias_crc.php



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RCC-Network SSA: 4. Highly Recommended Functions

Some highly recommended functions are:

- Facilitate data/metadata exchange amongst NMHSs, including on-line access, through an agreed regional mechanism
- Quality Control on regional datasets
- Assist NMHSs to develop and maintain historical climate datasets
- Advise RCC Users on data quality management.
- Promote studies of regional climate variability
- Promote application research, and assist in the specification and development of sector specific products.
- Verification of seasonal forecast; Developed a suite of diagnostics and visualizations for the verification of hindcasts produced using CPT.
- Monitoring to other variables: vegetation indices (NDVI, EVI)

RCC-Network SSA: 4. Highly Recommended Functions

The projects that support the RCC-SSA

- “Towards usable climate science - Informing sustainable decisions and provision of climate services to the agriculture and water sectors of southeastern South America”. IAI. CRN3035 (http://www.crc-sas.org/es/pdf/i&d/IAI-CRN3035_es.pdf) (finalized)
- “Hydro-climate Services in La Plata River Basin”. IDB (finalized)
- “CLIMAX. Climate Services through knowledge co-production: A Euro-South American initiative for strengthening societal adaptation response to extreme events”. Belmont Forum
- Implementation of drought Information System for Southern South America. IDB.

RCC-Network SSA: Role in RCOF activities

The RCC contributes information presented at the RCOFs, for example, diagnostics of regional climate conditions and statistical seasonal forecasts.

Some time, RCC contributes in the training session. For example, RCC members have conducted short training sessions on procedures developed to verify hindcasts produced using the CPT tool.

In between RCOFs, monthly virtual meetings are held among RCC members; coordination of the virtual meetings is rotated among each country. Nevertheless, no regional consensus forecasts are produced. Instead, climate diagnostic is produced and links are provided in the RCC' web site to the outlooks produced by each country.

To date, the only funds available for RCOFs are provided by WMO. No additional support has been sought to date, although that is under discussion.

RCC-Network SSA: User Engagement

There is no formal mechanism to collect feedback from NMHSs. Feedback is often received through informal interactions among personnel from the member NMHSs or through working groups

During the RCOF all participant discusses about the gaps, needs and new products.

RCC-Network SSA Web Portal

The URL for its website is www.crc-sas.org. The website is available in Spanish, Portuguese and English. The shared (mirrored design originally envisioned for the RCC's) website has not functioned well. A shift to a single web site location is being discussed.



SWOT analysis

Strengths:

- Implementation of a regional climate database with data routinely contributed by all RCC members.
- All procedures (from database implementation to generation of diagnostic indices) are based on free software that can be freely distributed.
- Strong commitment by member countries to participation and collaboration within the RCC framework.

Weaknesses:

- Limited availability of human resources.
- Most RCC products to date were developed and implemented with financial support from external projects.

Opportunities:

- The experience of collaborating within the RCC framework has opened opportunities for a stronger integration of activities among member countries.

Threats:

- Budget issues are getting worse in all RCC members.

Way Forward

- Include data from automatic weather station - satellite imagery
- Development and implementation of a drought information system.
- Improve the web site to allow for frequent update of products, events, social networks
- Calibration and verification of seasonal climate numerical models
- Validation of CHIRPS
- Explore other statistical methods for seasonal forecast using a code developed by the Instituto Nacional de Meteorología (INMET)
- More experience is needed on the integration of climate information with sector-specific models in order to characterize likely impacts for risk management purposes.



Thank you Merci

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