

README

Historical Database for Gridded Daily Precipitation Dataset over South America

Leading scientists:

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1. Introduction

The Combined Scheme approach (hereafter, CoSch, Vila et al, 2009) provides a new high-resolution, gauge–satellite-based analysis of daily precipitation over continental South America. This methodology is based on a combination of additive and multiplicative bias correction schemes to get the lowest bias when compared with the observed values (rain gauges). In this case, real-time TRMM Multisatellite Precipitation Analysis (TMPA, Huffman, 2007), (in which no rain gauges are incorporated) is used as a high-quality rainfall algorithm, whereas a daily rain gauge database is used to correct the bias on a daily basis over South America. In a second step, and considering that TRMM mission ended in 2015 and Global Precipitation Measurement (GPM) started in the same year, the replacement of the TMPA algorithm for Integrated Multi-satellitE Retrievals will be considered for GPM (IMERG) once that algorithm can be reprocessed for a suitable number of years to perform a reliable validation.

2. Database Characteristics

The initial reprocess the entire database from 2000 involve two different tasks

a. Collect and run quality control of global and regional rain gauge data: as described in the Interim Report for the Climate Insurance Fund (CIF), the upgrade of the historical dataset involves two different actions: The first one is to reprocess the current dataset available at CPTEC/INPE from GTS and Brazilian regional networks to include all Latin American countries for the following period: March 2000 – present. A basic QC process was performed .

In order to improve the amount of gauge data, a second action was performed: The Global Historical Climatology Network - Daily (GHCN-Daily) dataset was downloaded and processed to extract daily precipitation data to increase the number of records in the current database and extend the geographical coverage from southern Argentina and Chile to Mexico . GHCN-Daily integrates daily climate observations from approximately 30 different data sources and quality assurance checks are applied to the full dataset.

Figure 1 shows the rainfall field obtained with CoSch for March 3, 2000. All black dots represent the position of raingauges.

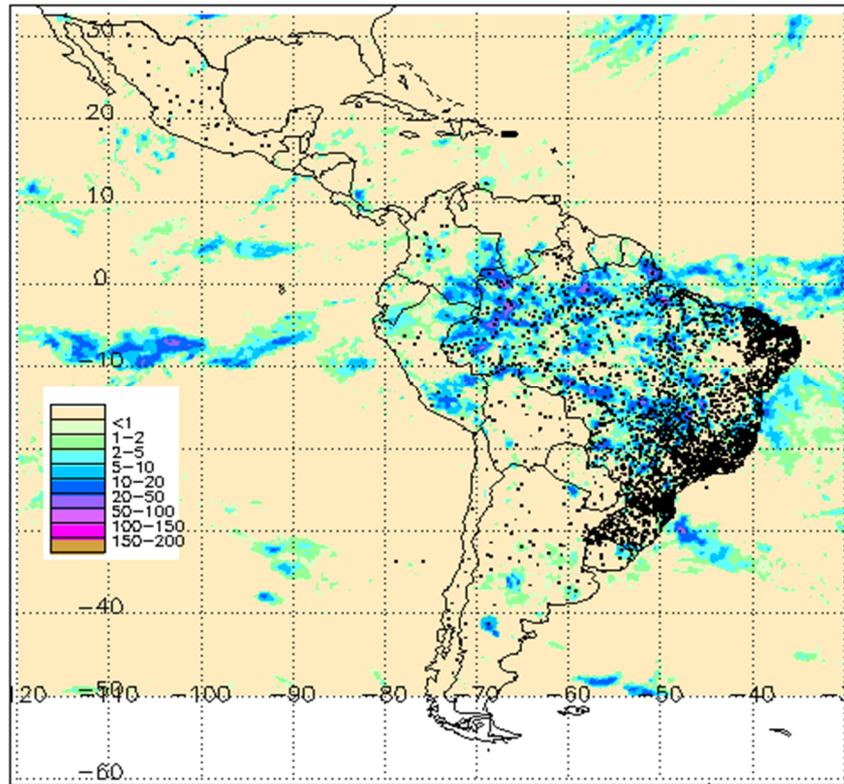


Figure 1: CoSch output for March 3rd, 2000. Black dots represent the position of the raingauges utilized in the combined methodology

b. Reprocess daily accumulated satellite-based rainfall fields from 2000 to present: In Mexico, Central and South America, the daily gauge data (24 hours accumulation) is calculated from 12:00 UTC of previous day to 12:00 of the current day. The TMPA algorithm is performed over 3-hour periods for 0.25 degrees spatial resolution. In order to merge both dataset in CoSch, daily accumulations for the same period was done for TMPA-RT. This algorithm was considered because no rain gauges are incorporated. Table 1 summarizes the characteristics of the dataset:

Combined Scheme file characteristics	Value
Spatial resolution	0,25 °
Spatial coverage	Southern Argentina and Chile to Mexico
Temporal resolution	Daily
Temporal coverage	March 2000 – Present
Geographical Coverage	33 N – 60 S, 120 W – 30 W
Number of lines	372
Number of columns	360
Numeric Format	<ul style="list-style-type: none"> • Generic binary, real*4 , little-endian byte order • netCDF
Name format	CoSch_yyyymmdd1200.bin
File size	535,680 bytes (binary, uncompressed)

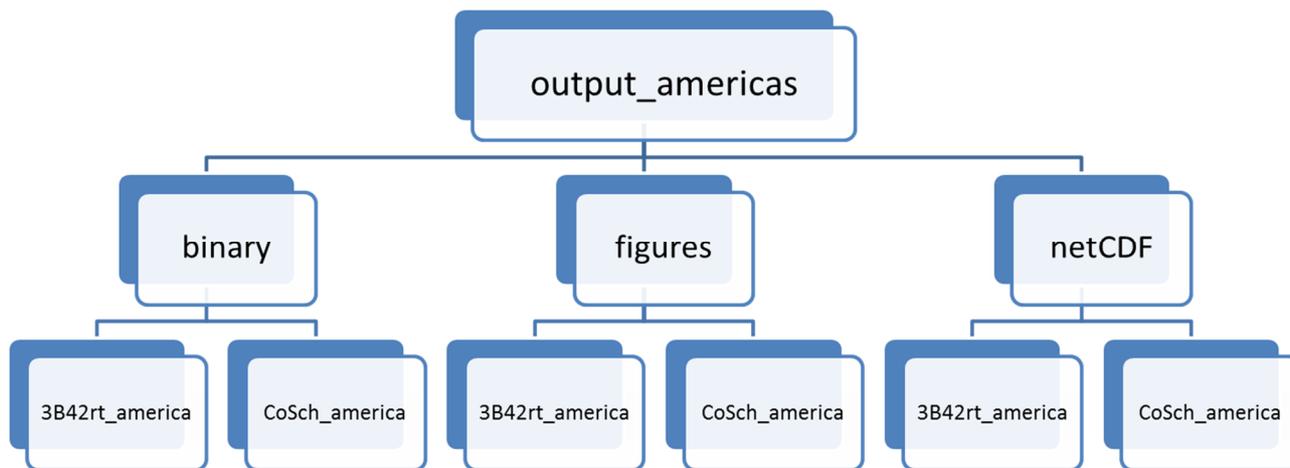
Where *yyyy* is the year, *mm* is the month and *dd* is the day

The information about the storage and dissemination system is the following:

ftp://ftp.cptec.inpe.br/cif.latam

3. Directory structure

The directory structure is the following



where 'binary' and 'netCDF' directories refers to the digital data as shown in Table 1 while on the directory 'figures', png files are available for visual conference.

Inside each directory two directories were created: CoSch_america and 3B42rt_america. In the first case, the result of the CoSch algorithm is stored. In the second directory, uncorrected data from TMPA (TRMM Multisatellite Precipitation Analysis – real time – 3B42rt) is also available. Inside each directory, a new structure is defined: each file (uncompressed is available at YYYYMM directory where YYYY is the year and MM is the month.

A new directory called 'documents' is added to store all relevant documents (reports, validation studies, papers, etc.) related with this project.

An example of this structure is shown below for netCDF files of CoSch files for June 2006.

Conteúdo do diretório ftp://cif.latam@ftp.cptec.inpe.br/output_americas/netCDF
/CoSch_america/200006/

 Um diretório acima

Nome	Tamanho	Última modificação	
 CoSch_200006011200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006021200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006031200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006041200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006051200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006061200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006071200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006081200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006091200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006101200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006111200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006121200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006131200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006141200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006151200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006161200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006171200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006181200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006191200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006201200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006211200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006221200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006231200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006241200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006251200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006261200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006271200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006281200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006291200.nc	541 KB	07/11/2017	10:18:00
 CoSch_200006301200.nc	541 KB	07/11/2017	10:18:00

The database will be updated daily with a lead time of 12 hours or less.

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