Animation and Reconstructed Data of the Global Annual Precipitation since 1900

Product Release Date: October 6, 2014

1. Animation Download

The movie of the global annual precipitation can be downloaded using the following links

http://shen.sdsu.edu/precip/movie_jul_jun.mov

or

http://shen.sdsu.edu/precip/movie_jul_jun.wmv

2. Citing the Work

We kindly request that you cite the use of this animation product in a publication or presentation using the following citation: Shen, S.S.P., N. Tafolla, T.M. Smith, and P.A. Arkin, 2014: Multivariate regression reconstruction and its sampling error for the quasi-global annual precipitation from 1900-2011, *Journal of the Atmospheric Sciences*, 71, 3250-3268. doi: 10.1175/JAS-D-13-0301.1.
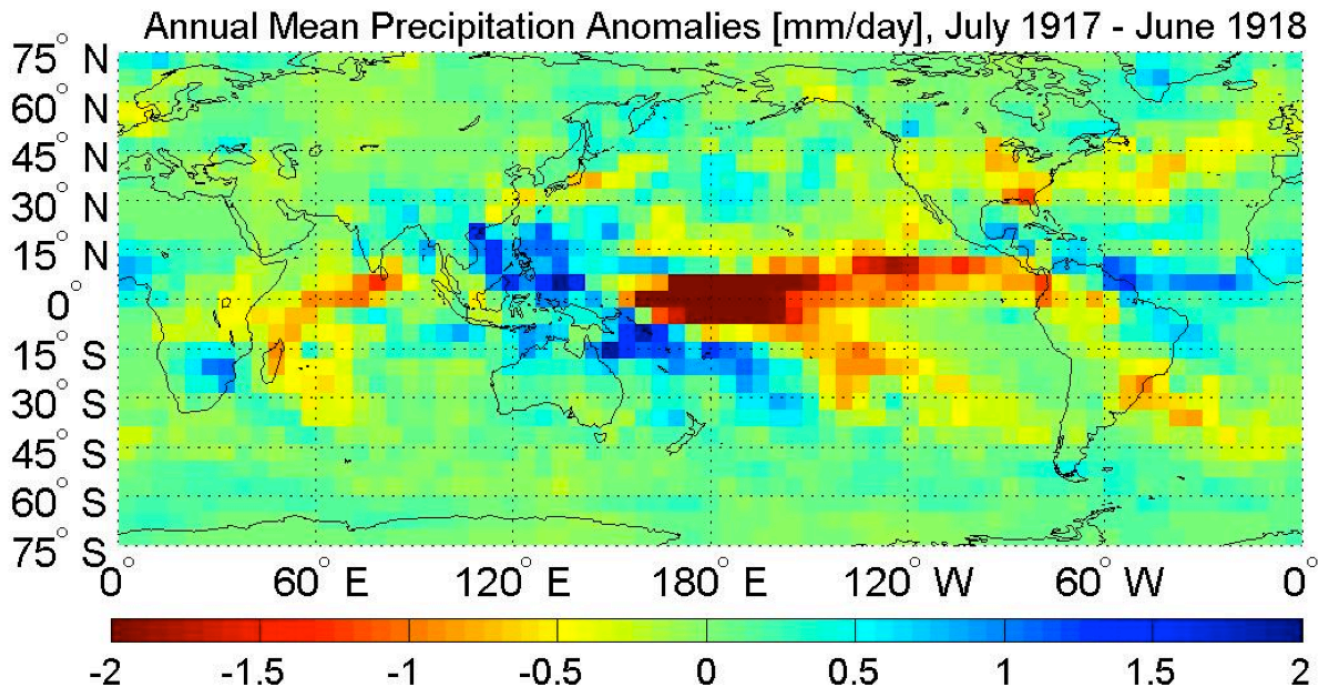
3. Product Summary

Figure 1. July 1917-June 1918 annual global precipitation [units: mm/day].

This is an animation of the global annual precipitation from 1900 based on the optimal reconstruction paper of Shen et al. (2014) and SOGP V1.0 spectral optimal gridding of precipitation (SOGP) Matlab toolkit Version 1.0. The current animation downloaded from this open access is the annual data aggregated from July to June of next year. The spatial resolution is 5° latitude-longitude, covering from 75^oS to 75^oN. The frame of the July 1917-June 1918 (a strong La Niña episode) annual global precipitation is shown below.

4. Digital Data and Related Products

The digital data are available upon request of the SOGP 1.0 precipitation products. Please email to sogp.precip@gmail.com with subject as "SOGP precipitation product request: enter your name, affiliation, position, and purpose of the usage." In the request please specify what digital data you are requesting.

Beside the datasets listed below, we can also customarily produce the datasets for you free of charge for specified spatial-temporal domains with different resolutions from a month to a year if they are used for research purposes. Currently, our database already has the following data:

1) Reconstruction data: Excel table of the reconstructed annual precipitation since 1900 aggregated from January to December, February – January, March – February, …, December – November.

2) Reconstruction figures: JPG figure for each year according to the above 12 kinds of annual data aggregation methods.

3) EOFs: Empirical orthogonal functions (EOF) data Excel file and jpg files based on the GPCP data of 1979-2008 for the 12 kinds of annual data aggregation.

4) PCs: Principal components of the corresponding EOFs.

5) Reconstruction coefficients: Regression reconstruction coefficients of all the included EOF modes.

6) Global average: Global average annual precipitation time series: data in Excel and jpg figure.

7) Error data for uncertainty: Root mean square error (RMSE) Excel data for every annual reconstruction.

8) Climatology: GPCP precipitation climatology for the base period of 1979-2008 based on each of the 12 ways of annual data aggregation.

5. Computer Programs SOGP 1.0

The software package SOGP 1.0 for the reconstruction is also available upon request. Please email to sogp.precip@gmail.com with subject as "SOGP precipitation product request: enter your name, affiliation, position, and purpose of the usage."

 SOGP 1.0 is a spectral optimal gridding of precipitation (SOGP) Matlab toolkit Version 1.0, which is designed to reconstruct the annual or monthly precipitation anomalies [units: mm/day] for the entire globe except the polar regions south of 75°S and north of 75°N. The reconstructed area is 96% of that of the entire Earth. The output's spatial-temporal coverage is flexible according to user's needs and is determined by the following spatial-temporal box: [lat1, lat2] X [lon1, lon2] X [time1, time2]. The latitude band [lat1, lat2] must be within [75°S, 75°N]. The longitude range must be in [0, 360]. The temporal range is limited to [1900, 2011], which will be updated to [1850, present] according to the

availability of the GHCN data. The program is based on the paper of Shen, S.S.P., N. Tafolla, T.M. Smith, and P.A. Arkin, 2014: Multivariate regression reconstruction and its sampling error for the quasi-global annual precipitation from 1900-2011, *J. Atmospheric Sciences*, 71, 3250-3268. doi: 10.1175/JAS-D-13-0301.1. The paper uses multivariate regression to reconstruct the gridded data by using the Global Precipitation Climatology Project (GPCP) from 1979 - 2008 data to compute the empirical orthogonal function (EOF) basis and the gridded Global Historic Climatology Network (GHCN) from 1900 as the data for the response variable in the regression.

6. Contact

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