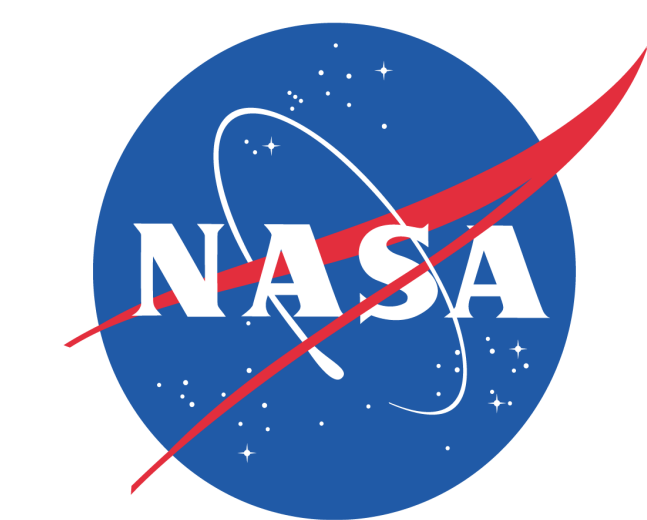


# 65 Years of Reprocessed GLDAS Version 2.0 Data and Their Exploration Using the NASA GES DISC Giovanni



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GLDAS-2.0 data have been reprocessed with updated Princeton meteorological forcing data within the Land Information System (LIS) Version 7, and temporal coverage have been extended to 1948 ~ 2012.

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## Reprocessed GLDAS-2.0 Data

- Global Land Data Assimilation System Version 2 (GLDAS-2) has two components:
  - GLDAS-2.0:** entirely forced with the Princeton meteorological forcing data
  - GLDAS-2.1:** forced with atmospheric analysis and observation-based data after 2001
- In order to create more climatologically consistent data sets, NASA GSFC's Hydrological Sciences Laboratory (HSL) has recently reprocessed the GLDAS-2.0, by using updated Princeton meteorological forcing data within the LIS Version 7.
- GLDAS-2.0 data and data services are provided at NASA GES DISC Hydrology Data and Information Services Center (HDISC), in collaboration with HSL.

Basic Characteristics of Reprocessed GLDAS-2.0	
Latitude extent	-60° to 90°
Longitude extent	-180° to 180°
Spatial resolution	1.0° x 1.0° and 0.25° x 0.25°
Temporal resolution	3-hourly and monthly
Temporal coverage	January 1, 1948 – December 31, 2012
Dimension	150 (lat) x 360 (lon) for the 1.0° data 600 (lat) x 1440 (lon) for the 0.25° data
Origin (1 <sup>st</sup> grid center)	(-59.5S, -179.5) for the 1.0° data (-59.875, -179.875) for the 0.25° data
Land surface model (LSM)	Noah 3.3
Format	NetCDF

## What's New about GLDAS-2.0

- Updated Princeton forcing data
- Upgraded Land Information System
  - LSM Noah 3.3
  - MODIS-based land surface parameters
- Archived in NetCDF
- Self-describing and CF compliant
- Works with commonly used tools
- Additional model output fields
  - See the variable list table (Orange highlighted are new to GLDAS-2.0)
- Extended to 1948 ~ 2012
  - 1948 ~ 2010 data are available now
  - 2011 ~ 2012 are being checked for data integrity and will be available early 2016.

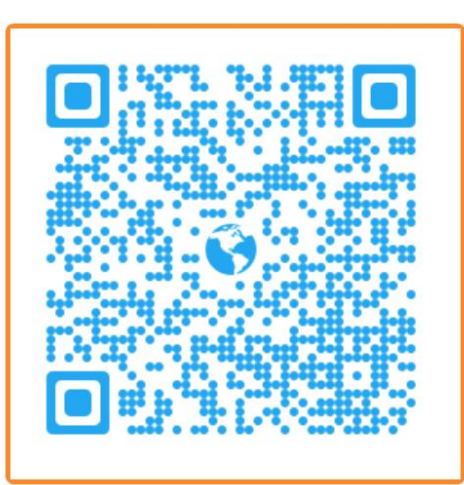
## Variables for Reprocessed GLDAS-2.0

Variable short name	Description	Unit
Swnet_tavg	Net short wave radiation flux	W m-2
Lwnet_tavg	Net long-wave radiation flux	W m-2
Qle_tavg	Latent heat net flux	W m-2
Qh_tavg	Sensible heat net flux	W m-2
Qg_tavg	Heat flux	W m-2
Snowf_tavg	Snow precipitation rate	kg m-2 s-1
Rainf_tavg	Rain precipitation rate	kg m-2 s-1
Evap_tavg	Evapotranspiration	kg m-2 s-1
Qs_acc	Storm surface runoff	kg m-2
Qsb_acc	Baseflow-groundwater runoff	kg m-2
Qsm_acc	Snow melt	kg m-2
AvgSurfT_inst	Average surface skin temperature	K
Albedo_inst	Albedo	%
SWE_inst	Snow depth water equivalent	kg m-2
SnowDepth_inst	Snow depth	m
SoilMoi0_10cm_inst	Soil moisture	kg m-2
SoilMoi10_40cm_inst	Soil moisture	kg m-2
SoilMoi40_100cm_inst	Soil moisture	kg m-2
SoilMoi100_200cm_inst	Soil moisture	kg m-2
SoilTMP0_10cm_inst	Soil temperature	K
SoilTMP10_40cm_inst	Soil temperature	K
SoilTMP40_100cm_inst	Soil temperature	K
SoilTMP100_200cm_inst	Soil temperature	K
PotEvap_tavg	Potential evaporation rate	W m-2
ECanop_tavg	Canopy water evaporation	W m-2
Tveg_tavg	Transpiration	W m-2
ESoil_tavg	Direct evaporation from bare Soil	W m-2
RootMoist_inst	Root zone soil moisture	kg m-2
CanopInt_inst	Plant canopy surface water	kg m-2
Wind_f_inst	Wind speed	m s-1
Rainf_f_tavg	Total precipitation rate	kg m-2 s-1
Tair_f_inst	Temperature	K
Qair_f_inst	Specific humidity	kg/kg
PSurf_f_inst	Pressure	Pa
SDown_f_tavg	Downward short-wave radiation flux	W m-2
LWdown_f_tavg	Downward long-wave radiation flux	W m-2

## Access to GLDAS-2.0 Data

- Mirador search and download
- OPENDAP
  - Parameter and spatial subsetting
  - Output Types: NetCDF and ASCII
- HTTP downloading
  - Quick access and batch processing
  - Navigation based on date
- Giovanni
  - Online visualization and analysis
  - Output Types: HDF, NetCDF, csv, and Image (GeoTIFF/PNG/KMZ)

Questions?  
Please email  
gsfc-help-disc@lists.nasa.gov



GES DISC  
Hydrology  
Data  
Holdings



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LDAS  
Project  
Site

## Giovanni Visualization and Analysis System

Giovanni is a Web application developed by the GES DISC to provide a simple, intuitive way to visualize, analyze, and access vast amounts of Earth science remote sensing data, particularly from remote sensing and model, without having to download the data.

Reprocessed GLDAS-2.0 Variables in Giovanni  
<http://giovanni.gsfc.nasa.gov/giovanni/#dataKeyword=GLDAS>

The screenshot shows the Giovanni web interface with search results for 'GLDAS'. A table lists variables such as 'Average Surface Skin Temperature', 'Surface pressure', 'Specific humidity', 'Rain precipitation rate', 'Evapotranspiration', 'Total precipitation rate', 'Albedo', 'Baseflow-groundwater runoff', 'Snowfall', and 'Potential evaporation rate'. Each row includes details like source (GLDAS Model), temporal resolution, and units.

This screenshot displays the 'Maps Choices' and 'Time Series Choices' menus. It highlights 15 different plot types available in the system, including 'Time Averaged Map', 'Area-Averaged Difference', 'Area-Averaged', 'Seasonal', 'Accumulated', 'User-Defined Climatology', 'Vertical Profile', 'Cross Map, Latitude-Pressure', 'Cross Map, Longitude-Pressure', 'Cross Map, Time-Pressure', 'Hovmöller, Longitude', and 'Hovmöller, Latitude-Air Pressure'.

## User Defined Climatology

For "Months" option, users can further specify a month or multiple months and a year range, and get Lat-Lon Maps of user-defined monthly climatology.

For "Seasons" option, users can further specify a season or multiple seasons and a year range, and get Lat-Lon Maps of user-defined seasonal climatology.

## Seasonal Time Series

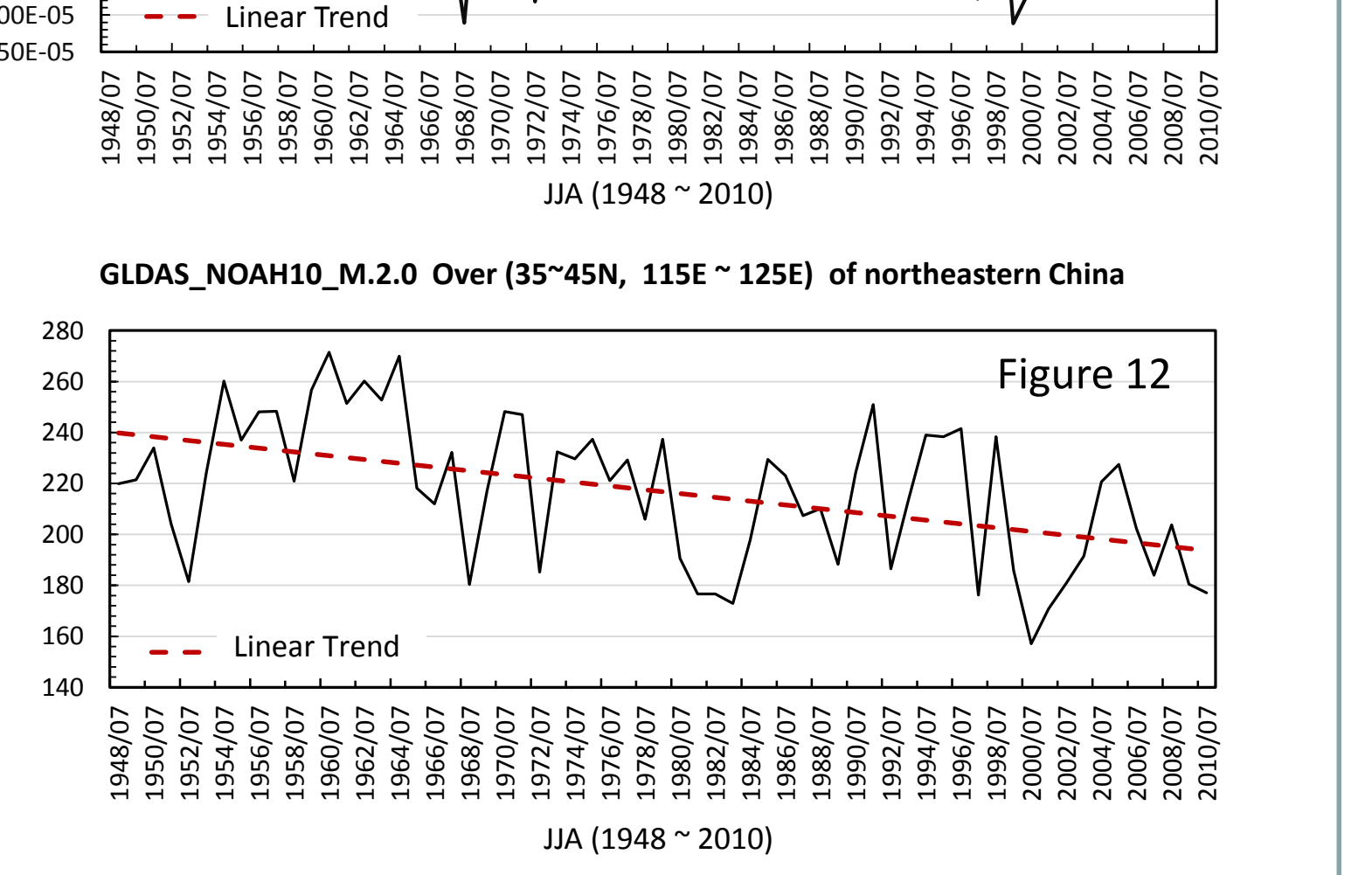
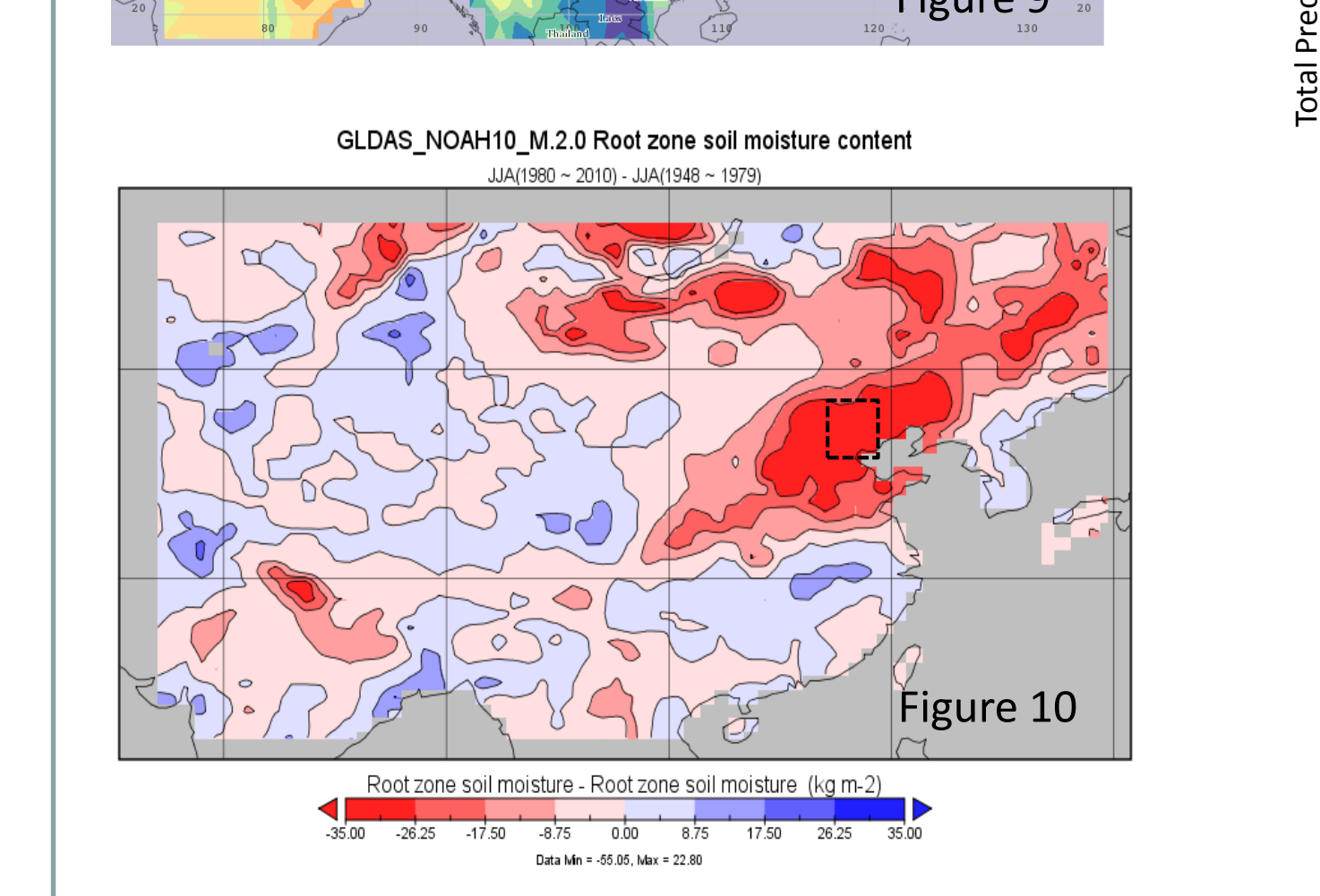
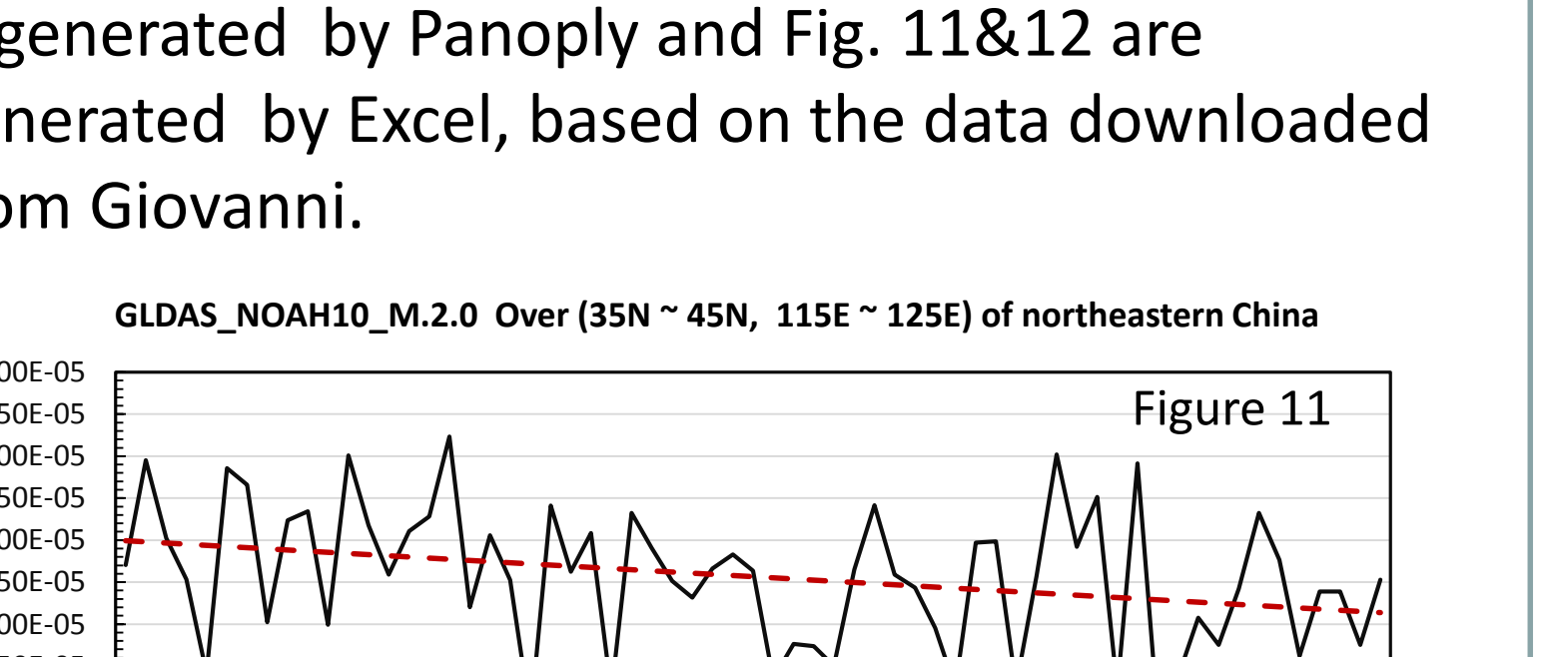
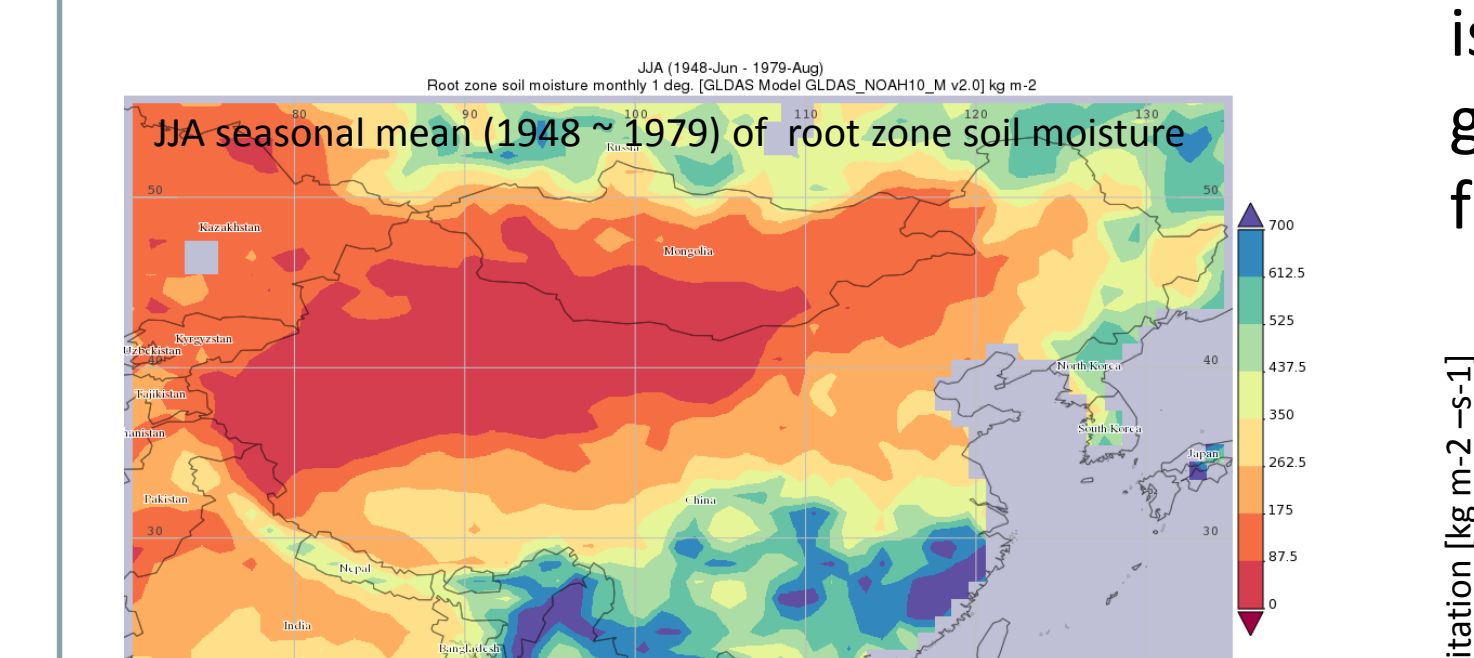
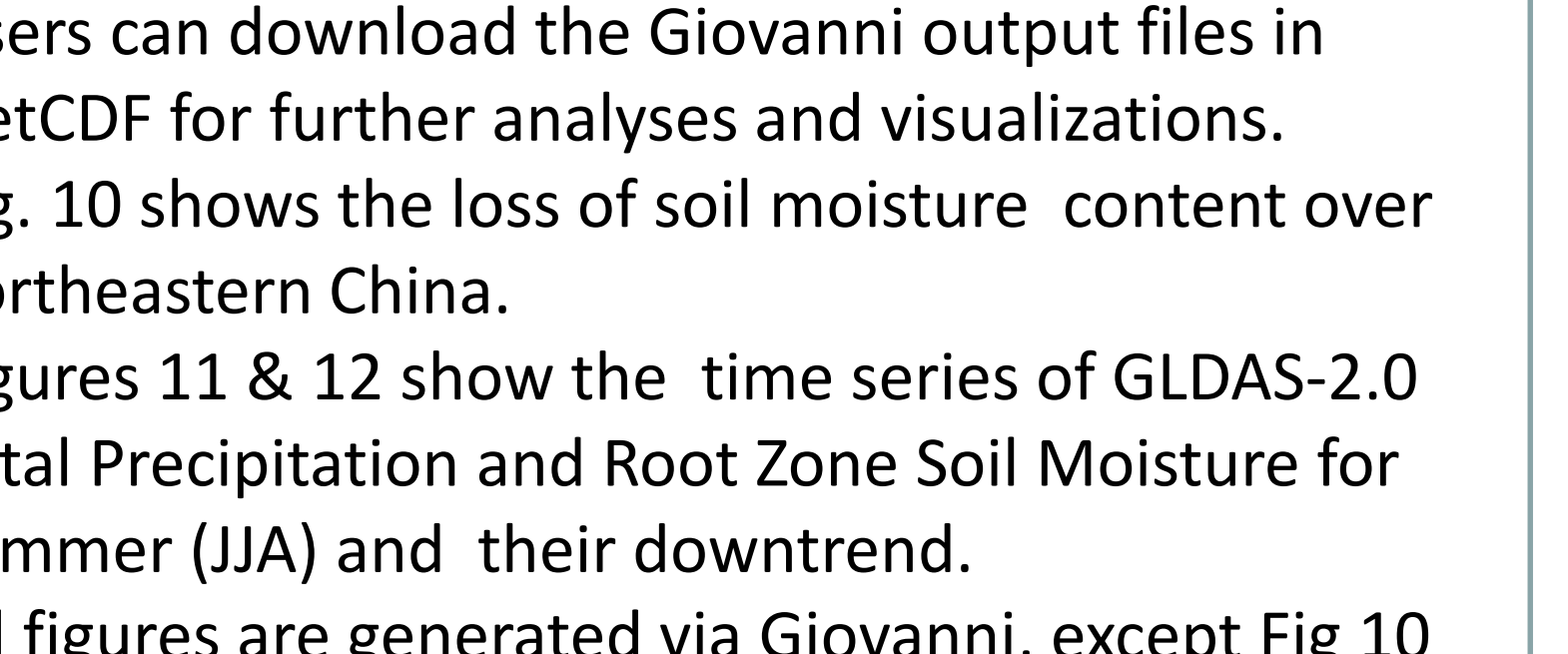
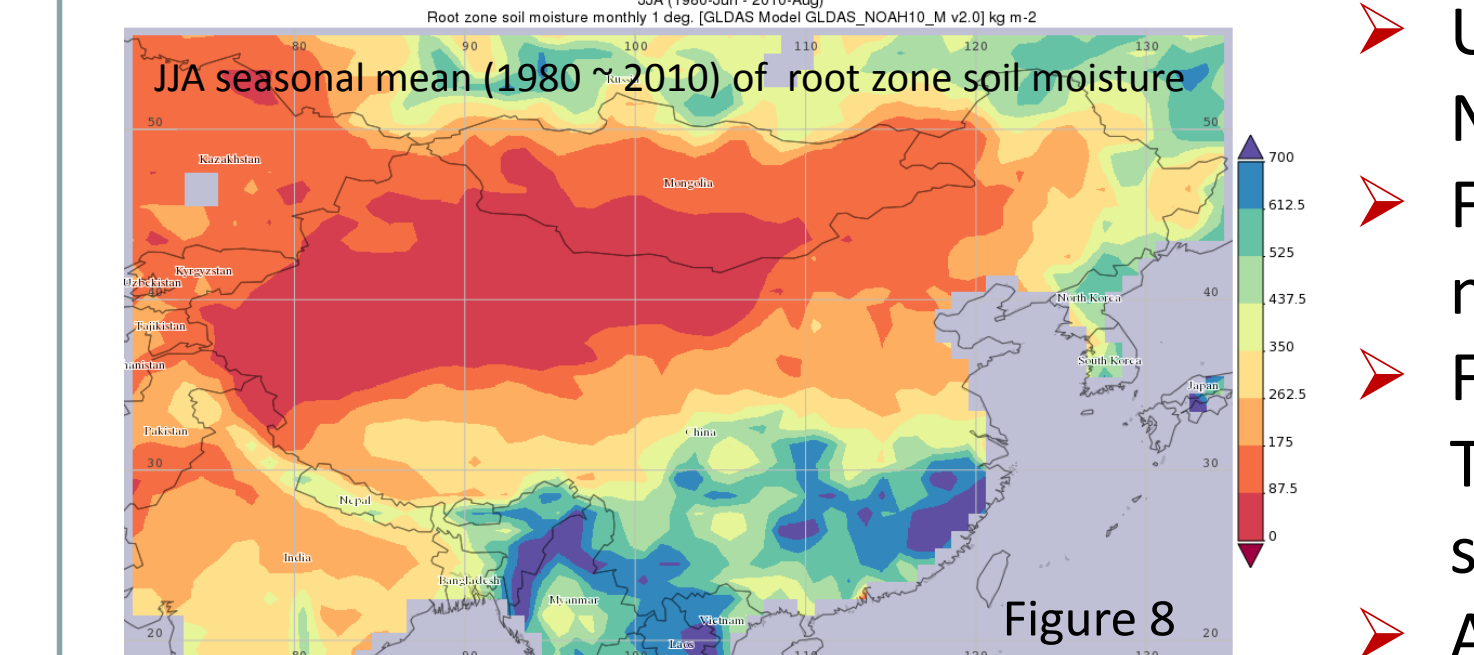
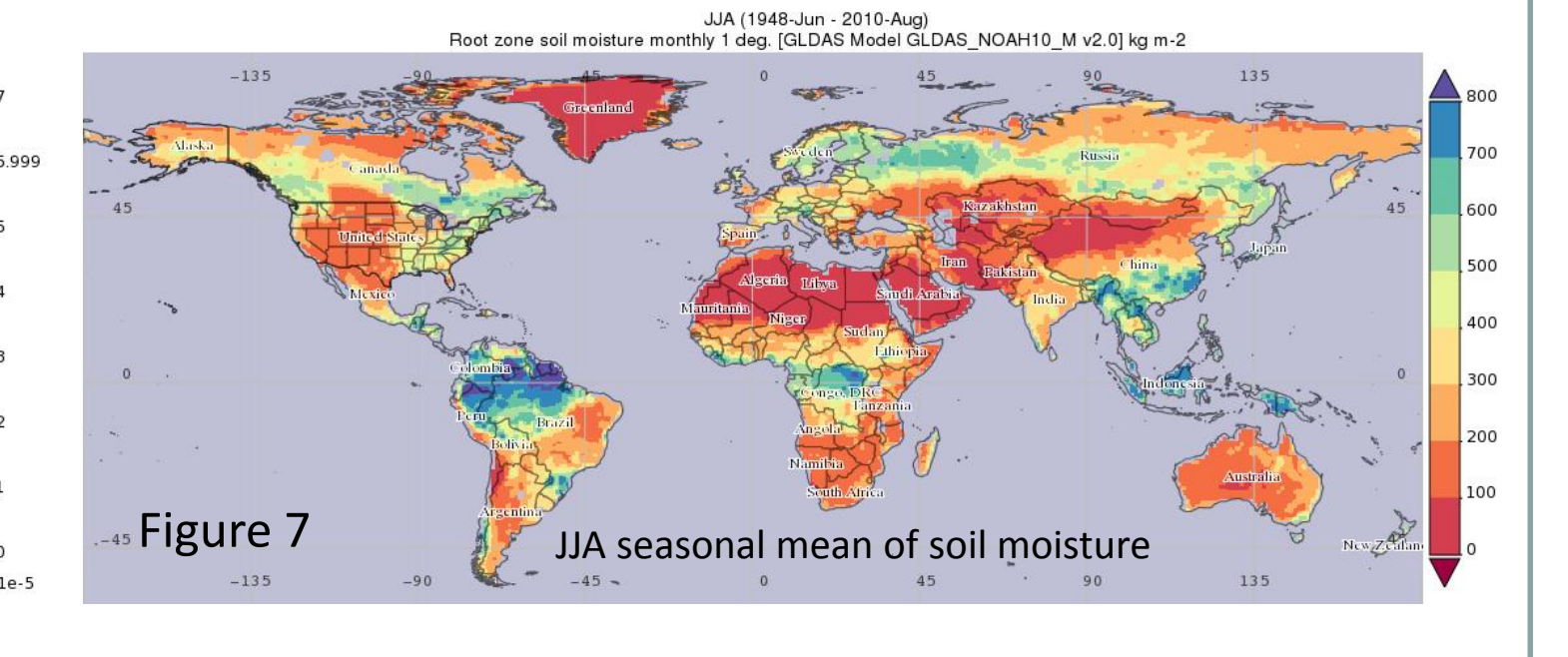
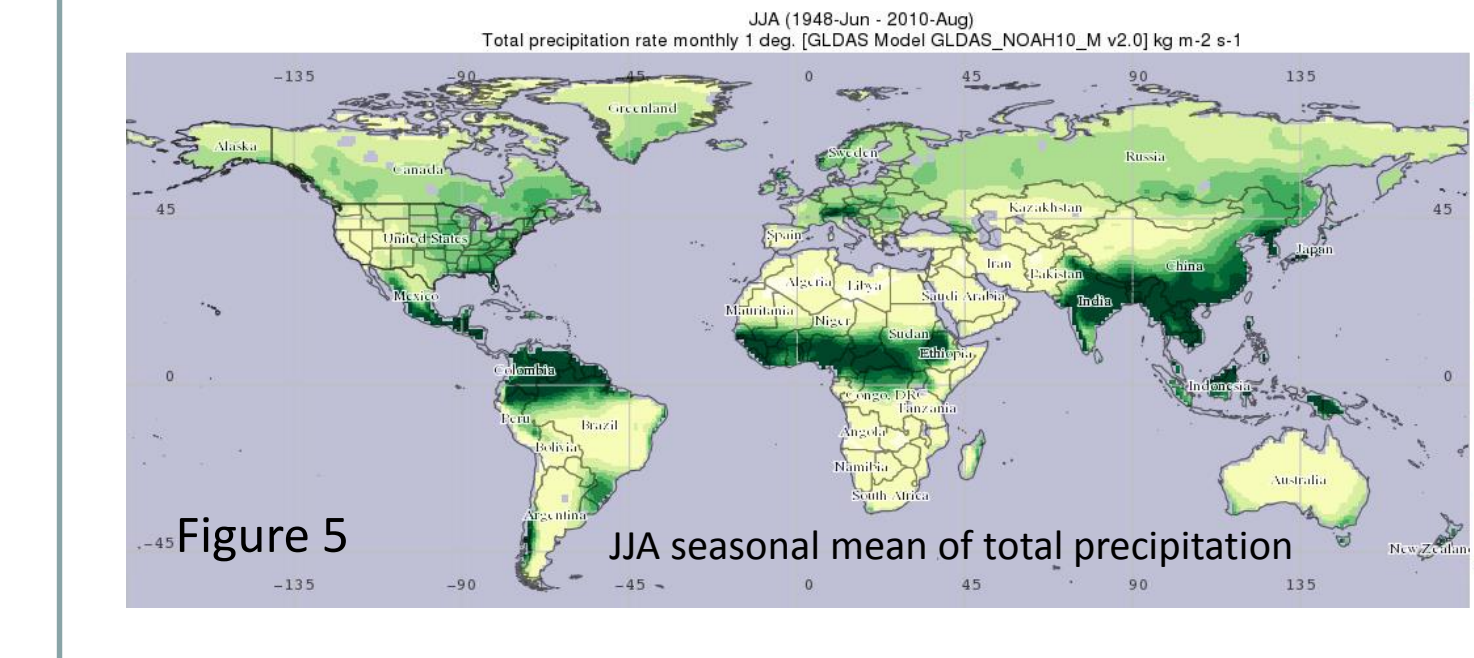
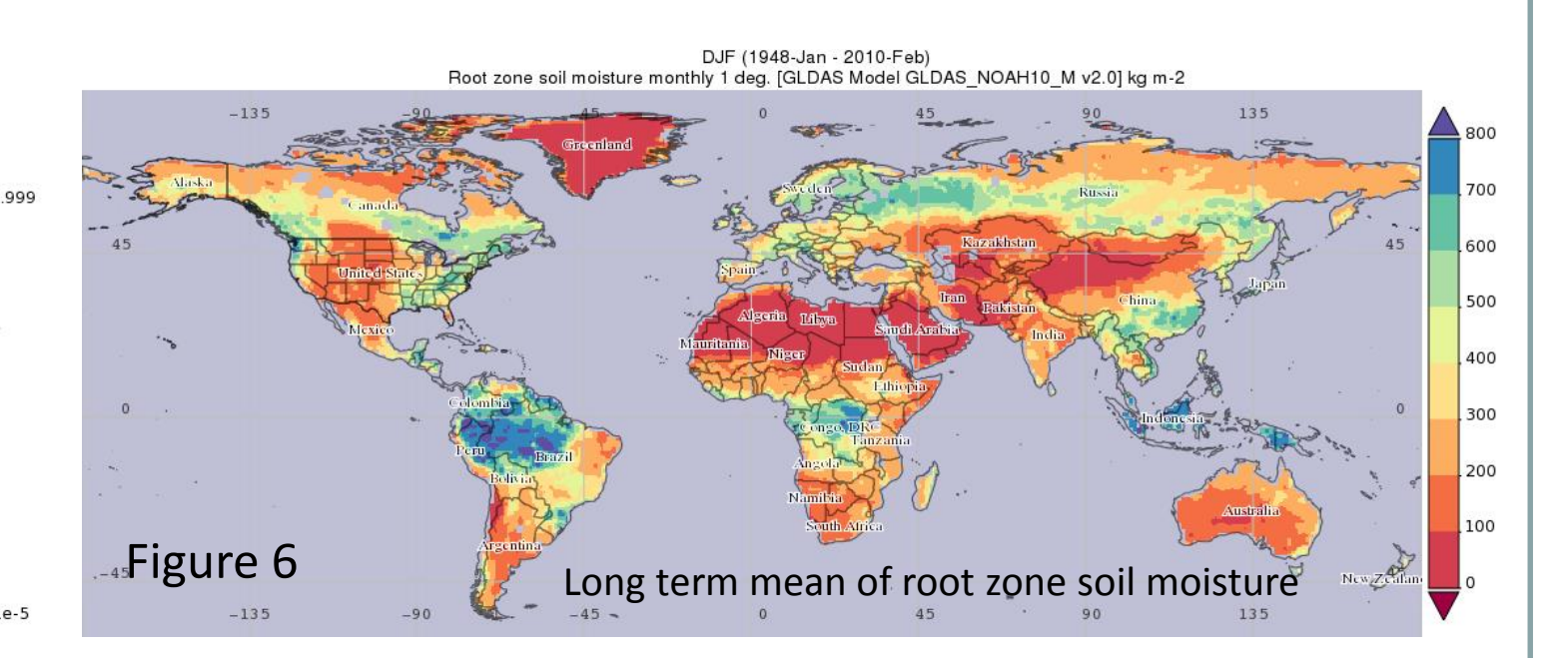
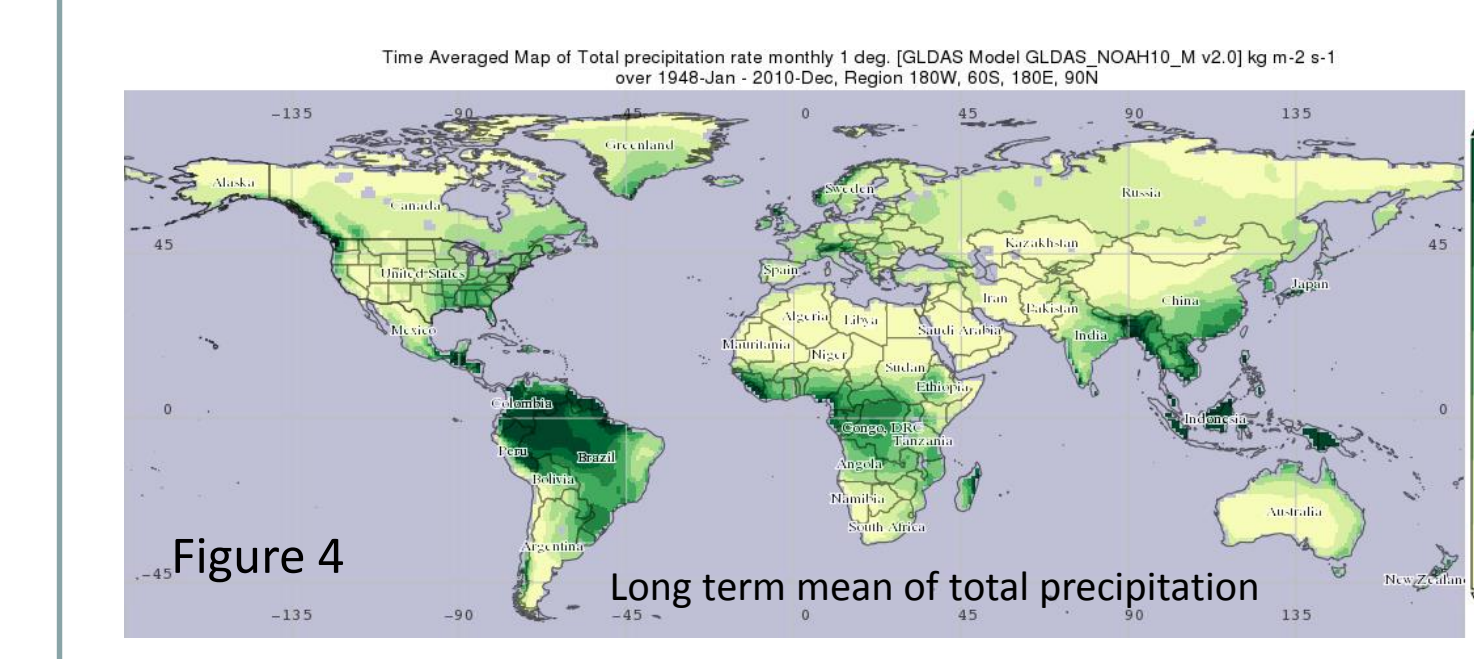
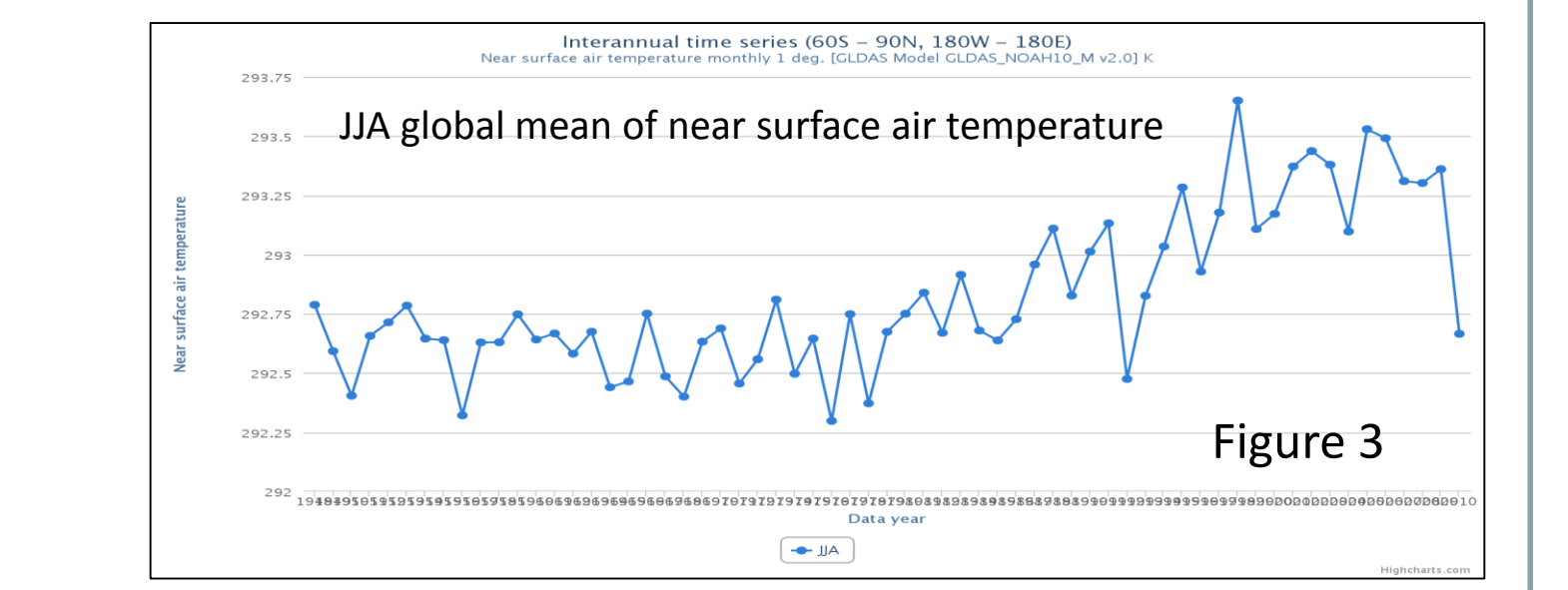
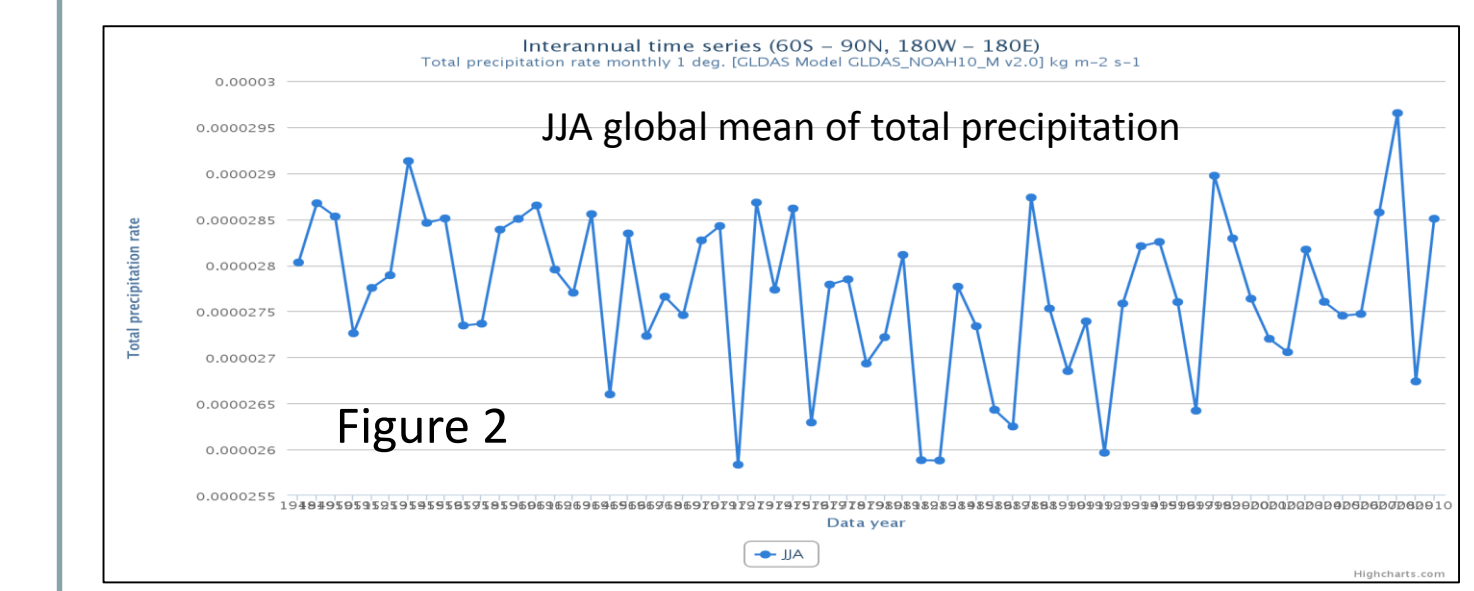
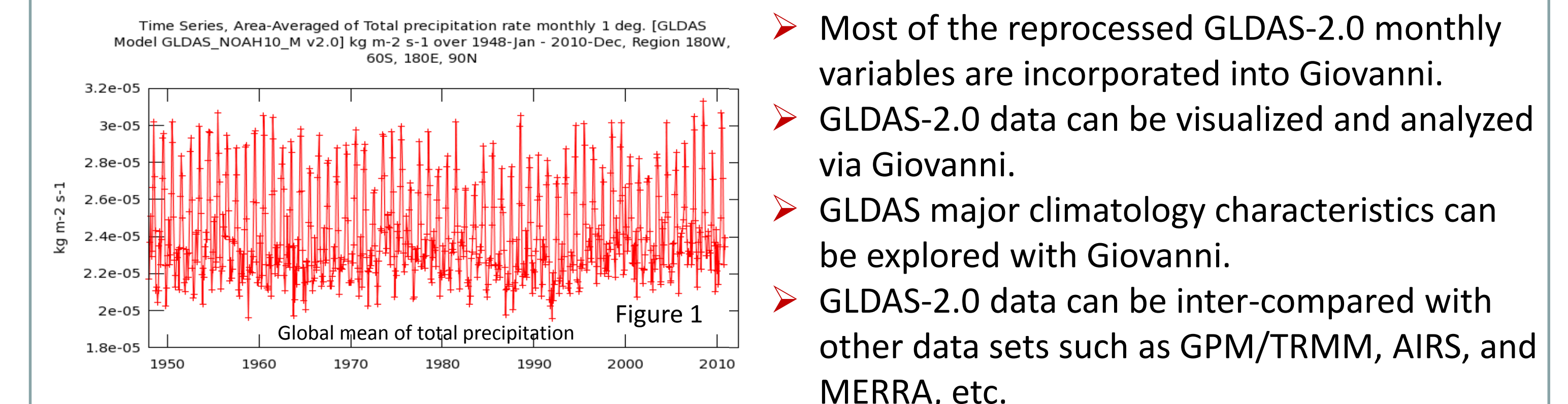
The Seasonal Time Series computes an area averaged time series, over the user's selected year range, for a given month or 3-month meteorological season.

## Region Selection

Bounding Box or Shapefile

This screenshot shows the 'Shapefile selection' dialog box. It lists various geographical regions and watersheds, including 'Volta', 'Wake - Marshall Islands', 'Wisa', 'Xun Jiang', 'Yangtze', 'Yasai', and 'Yenshey'. A 'Yangtze' region is currently selected.

## GLDAS-2.0 Climatology Explored by Giovanni



GLDAS-2.1 data will be generated from 2001 to near-present (1.5 month latency), replacing GLDAS-1.