Global Long-term Land Surface Products from MERRA-2 at GES DISC

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https://disc.gsfc.nasa.gov

Outline

- What is MERRA-2
- View A Drought Case with MERRA-2
- List of Land Surface Data
- Overview of Data Services:
  - How to find and download data
  - Giovanni

MERRA-2: (Modern-Era Retrospective analysis for Research and Applications, Version 2)

- Meteorology
- Atmospheric chemistry
- Aerosols
- Land
- Ocean

- Model: NASA GEOS-5
- Temporal Coverage: 1980-present
- Temporal Resolution: hourly, 3-hourly, and monthly
- Spatial Coverage: Global
- Spatial Resolution: 0.5\^\circ x 0.625\^\circ
- Data Format: NetCDF-4

Root Zone Soil Water, MERRA-2

March, Anomaly from Climatology (1980-2014)

Note: The Monthly Climatology were generated with monthly data from 1980 to 2014
**Presentation for Lawrence**

**Chris:** Do you know how to paste Gilberto’s sample presentation format into this Google Presentation?

**Steve:** See if this works. (GV)

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**Monthly Root Zone Soil Water Anomaly**

U.S. Drought Monitor

West

Anomaly of MERRA-2 root zone water content [m3/m3]

MERRA-2  - May 2015

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**Calculating Soil Moisture Percentiles**

Percentile soil moisture

M2T1NXLND_RZNC  - 2015.03.01

Climatology base period: 1980.01.01 – 2014.12.31

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**MERRA-2 Land Surface Data Examples**


- **M2T1NXLND:** Land Surface Diagnostics
  - water root zone, water surface layer
  - soil temperatures (layer 1-6)
  - evaporation, runoff
  - leaf area index, greenness fraction
- **M2T1NXFLX:** Surface Flux Diagnostics
  - bias corrected total precipitation, snowfall
  - surface specific humidity
  - surface wind speed
- **M2CONXLND:** Constant Land-Surface Parameters
  - Soil porosity
  - Thickness of soil (layer 1-6, root zone, surface layer, …)

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**Other Land Surface Data At GES DISC**

Precipitation from satellites

- TRMM - TMPA: (1998.01 – present)
- GPM - IMERG: (2014.03 – present)

Land Surface Data Assimilation:

- NLDAS: North American Land Data Assimilation System
- GLDAS: Global Land Data Assimilation System
- FLDAS: Famine Early Warning Systems Network (FEWS NET) Land Data Assimilation System
- NCA-LDAS: National Climate Assessment - Land Data Assimilation System
- GRACE-DA-DM: GRACE Data Assimilation (DA) for Drought Monitor (DM)

Other Merged products

- LANDMET: Land Surface Atmospheric Boundary Interaction Product
### Data Services at GES DISC

**Data downloading Services:**
- HTTPS: Direct access
- **Data Search System:** Search and download
- **Data Subsetter:** Parameter and spatial subsetter

**Visualization Services:**
- **Giovanni:** Online Data Visualization and Analysis

**Interoperable Services:**
- OPeNDAP: Open-source Project for a Network Data Access Protocol
- GDS: GrADS Data Server
- OGC/WMS: Open Geospatial Consortium/Web Map Service

**Online Help Documents:**
- FAQ: Short description of frequently asked questions
- Data How-To: (Recipes) Detailed examples on How to access and work with data.

### Registration to NASA Data System

https://urs.earthdata.nasa.gov/

- Register with Earthdata system
- Add data access applications, e.g., "NASA GESDISC DATA ARCHIVE"

### NASA GES DISC New Portal

https://disc.gsfc.nasa.gov

- Search Data
- **Search Document**
- Keywords
- **Spatial and temporal Range**
- **Browse Data by Category**

### NASA GES DISC Product List Page

- Sorting Columns
- Narrow down the search
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Giovanni: Online Visualization Features

https://giovanni.gsfc.nasa.gov

Vertical Profiles

Statistical Analysis

Root Zone Soil Water from MERRA-2

Example images from Giovanni

March (1980-2014)

March 2015
Thanks

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