

Daily Global Forecast System Climate Parameters (GFSPars)

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Introduction

The daily GFS Pars process is just used for the Global region. This dataset is used as input in other processes (e.g. dekadal GFS-Temperature)

Source Data

The GFS Pars dataset is provided on daily basis by the Africa desk of the NOAA Climate Prediction Center. The dataset contains 6 hourly for 7 days forecasts of climate parameters at 0.25 degree (25-km) resolution with a global extent. The 7 days corresponds to the current day + 6 forecast days. This process downloads 308 files (11 parameters * 4 per day * 7 days).

The source data is available from the NOAA anonymous http site as follows:

Host	http://ftp.cpc.ncep.noaa.gov
Location	/International/gfs_00z_25km/for_usgs/YYYYMMDD
Filename	00z_gfs_tttt_xxx.bin.gz where xxx goes from 06 to 168 (7 days) and tttt is the parameter type (dlwrf, dswrf, ulwrf, uswrf, tmp, tmax, tmin, ugrd, vgrd, pres, rh)
Usual time stamp	1036 (AM) hrs GMT
Usual file size	various (~279 Kb – 2012 Kb per file for 308 files)

Important Note: The 25-km (0.25) data is available since January 16, 2016 and unflipped. Before that date, the source data was 37-km (0.375) and flipped.

Contacts for missing data:

- Primary Contact: Nick Novella (nicholas.novella@noaa.gov) 301-763-8000 – x7513
- Secondary Contact: Vadlamani Kumar (vadlamani.kumar@noaa.gov) 301-763-8000 – x7522

Note: these files have maximum retention of ~72 hours on the NOAA ftp site.

Climate parameters are:

Parameter	Description
temp	Temperature [K]

Requirements

Software

- ArcGIS Desktop 10.x with python (2.x)

Access

- Python production server where python scripts run automatically using the windows scheduler task.
- No web or FTP locations are used in this process.

Data Processing

Scheduled processes

Setup:

- The global region has a main python script that runs on daily basis from the Windows task scheduler on the python production server. These scripts use the system date as input information.
- The region scheduled task runs using a windows (service) account and it is set up to run whether the user is logged or not and with highest privileges.
- The region process is documented in a log file located in `D:\FEWS\DataPortal_iraq\logs\YYYYMMDD\`. The content of this file is sent via e-mail to a notification list showing if each step of the process was completed or not.

Windows Scheduled Task	Run Time	Action
Daily GFS Prec and ClimPars	4:15 AM (CT)	<code>D:\FEWS\DataPortal_iraq\bin\global\daily\gfspars\global_daily_gfspars.py</code>

Manual process for recovery

For manual recovery use the global main script. Manual runs may be needed when the source (raw) data has issues, such as bad data, internet connection, etc., during the scheduled task running.

Steps:

1. Check if the source data is available from the NOAA http site.
2. If the data is not available, request information via e-mail to the NOAA contacts (primary and secondary)
3. When the data is available, run the global main script without input argument (if running on the same date the process failed) or with inputs argument from the command prompt.

Python scripts description

Executable and configuration python scripts by region

Each region has a configuration script and a main executable script. These scripts are in

`D:\FEWS\DataPortal_iraq\bin\`.

Global

This is the first region that needs to be run because it downloads the source files of the GFS precipitation dataset.

Location: `D:\FEWS\DataPortal_iraq\bin\global\daily\gfs`

<code>global_daily_gfs_pars_config.py</code>	Configuration file
<code>global_daily_gfs_pars.py</code>	Main script

Main Script steps

1. Downloads source data (1 file/6 hourly day = 308 files) from NOAA.

Command Line

USAGE: global_daily_gfs_pars.py YYYY M D

where YYYY is the 4 digit year .. M is the 1-2 digit of the month (1-12).. and D is the 1-2 digit of the day (1-31). YYYY M D is an optional input, so the default input information is today's date.

Example

```
> global_daily_gfs_pars.py 2013 9 9
```

Library python script

The executable scripts call different methods from a library python script. This library python script includes the main functions of a datasets by periodicity, so these functions can be re-use by the dataset regions. Also, it includes calls to common functions used by each periodicity dataset process(es).

D:\FEWS\DataPortal_iraq\lib\daily_gfs_process.py

Common library scripts required:

- D:\FEWS\DataPortal_iraq\lib\constants.py
- D:\FEWS\DataPortal_iraq\lib\dates.py
- D:\FEWS\DataPortal_iraq\lib\email_file.py
- D:\FEWS\DataPortal_iraq\lib\desc_raster.py
- D:\FEWS\DataPortal_iraq\lib\folder_utilities.py
- D:\FEWS\DataPortal_iraq\lib\file_utilities.py
- D:\FEWS\DataPortal_iraq\lib\geodatabase_utilities.py
- D:\FEWS\DataPortal_iraq\lib\print_msg.py
- D:\FEWS\DataPortal_iraq\lib\temp_workspaces.py
- D:\FEWS\DataPortal_iraq\lib\transfer.py
- D:\FEWS\DataPortal_iraq\lib\zips.py

Python method	Summary description
<code>__init__()</code>	Initializes all the variables based on the configuration script information and run date for the different methods (all regions).
<code>dataParsDownload()</code>	Download the global GFS climate parameters source files (1 file/6 hourly day = 308 files) from NOAA for the 7 forecast days (Global).

[__init__\(\)](#)

Method to initialize all the variables based on the configuration script information and run date to set base portal, log, lib, template, and data paths; region data information (region, type, periodicity, name, ftp, etc.) for the different methods defined in the python script.

[dataParsDownload\(\)](#)

Method to download the global daily GFS precipitation GZ files (1 file/6 hourly day = 308 files) from NOAA for the 7 forecast days. This method is just called from the global executable scripts.

Steps:

1. Loop each forecast 6 hourly day in hour format (from 06 to 168) to download the corresponding GZ file and add in a list information of the remote and local file size information and its comparison. After downloading the file, if the file is not correct, the process try to download the file in 4 attempts, but if the file is correct the process adds in a list information of the remote and local file size information and its comparison and will continue with the next one.
2. Print number of files downloaded and the list information gathered in the loop.
3. If the number of downloaded files is equal to the number of forecast hourly day, a zip file with the 308 GZ files is created as `gfsparsYYMMDDr.tar.gz`
1. Send e-mail with the log-file content from the global process(es).

Products

Global

Source (raw) data (GZ files)	D:\FEWS\DataPortal_iraq\data\Global\Daily\GFSPars\raw\YYYY\ gfsparsYYMMDDr.tar.gz
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Definitions

YYYY	4-digit year
MM	2 digit month
DD	2-digit hour
YY	2-digit year
H	hour
s	filename suffix

Revision History

Revision	Date	Description of changes	Requested By
1.0.0	Apr 14, 2016	Initial Version for FEWS PPG op	
2.0.0	Sep 06, 2019	Initial Version based on the FEWS PPG op full documentation	Iraq PPG training
2.1.0	Sep 25, 2019	Updated to just include the temperature parameter	