

Iraq operational PPG

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Introduction

The U.S. Agency for International Development (USAID) Famine Early Warning Systems Network (FEWS NET) is an information system designed to identify problems in the food supply system that potentially lead to famine or other food-insecure conditions in different regions around the world.

The FEWS NET data portal provides access to spatial data, satellite imagery, and other data and graphic products in support of the FEWS NET project. This portal provides a quick summary of the products available, frequency of observation (daily, 8-day, dekad, pentadal, monthly, yearly, etc.), and product format. Data products are available for continental, regional, and national scales where applicable. These products were previously created using AML scripts. Most of these scripts run by schedule (cron job) to provide updated information near real time. Based on the new technologies and updates in ArcGIS, new scripts using python were developed to work as the previous AML processes and run in operational mode using the Windows Scheduler Task.

The main purpose of this document is to provide information about how the python scripts run as operational or manual processes for the FEWS python product generation (PPG).

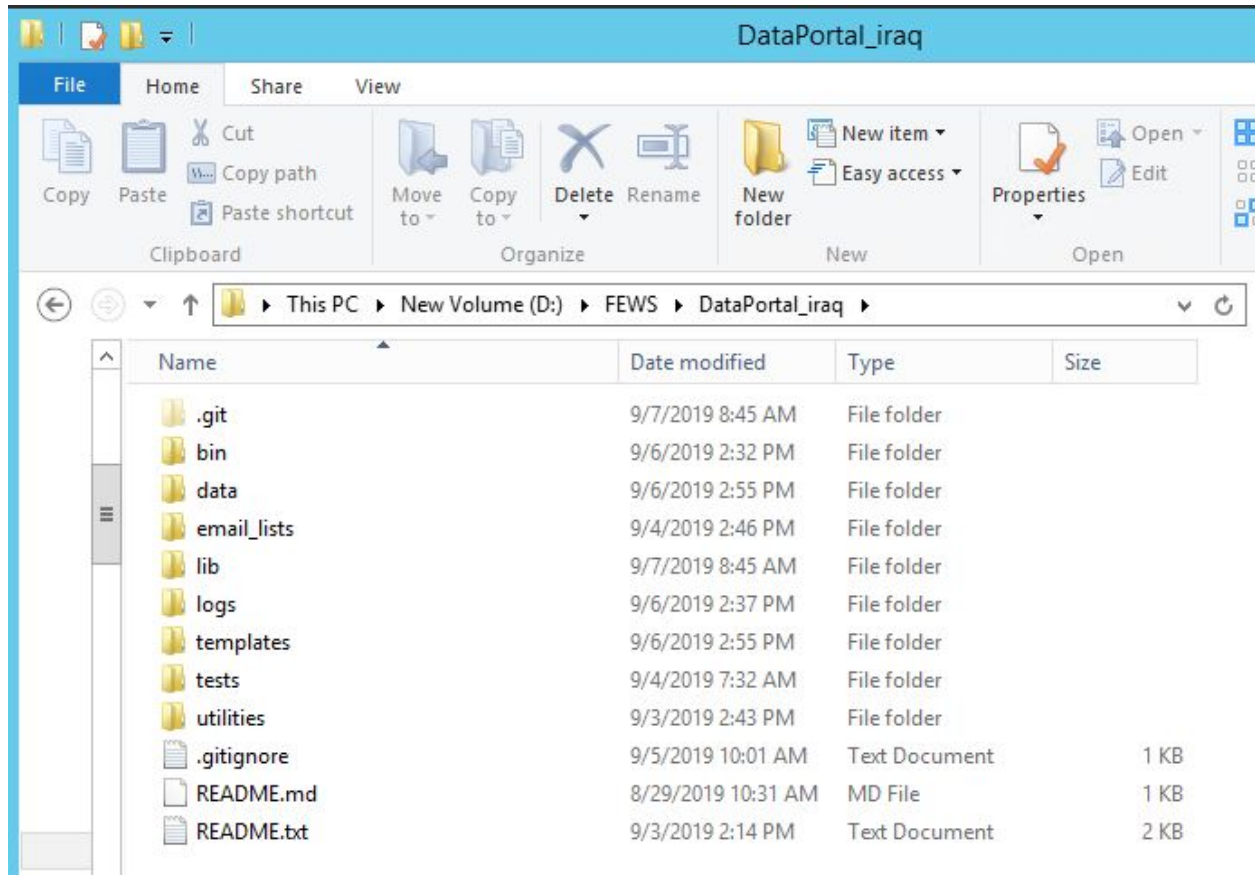
The location of the python scripts and folder structure needed for the processes can be found on a production server for operational and manual recovery runs and on a development server for code development under `D:\FEWS\DataPortal_iraq\`.

This folder contains the following subfolders, where bin and data folders follow the pattern for the subfolders as

```
<region_level1>\<region_level2>\<region_level...>\periodicity\dataset  
_product\<subproduct>
```

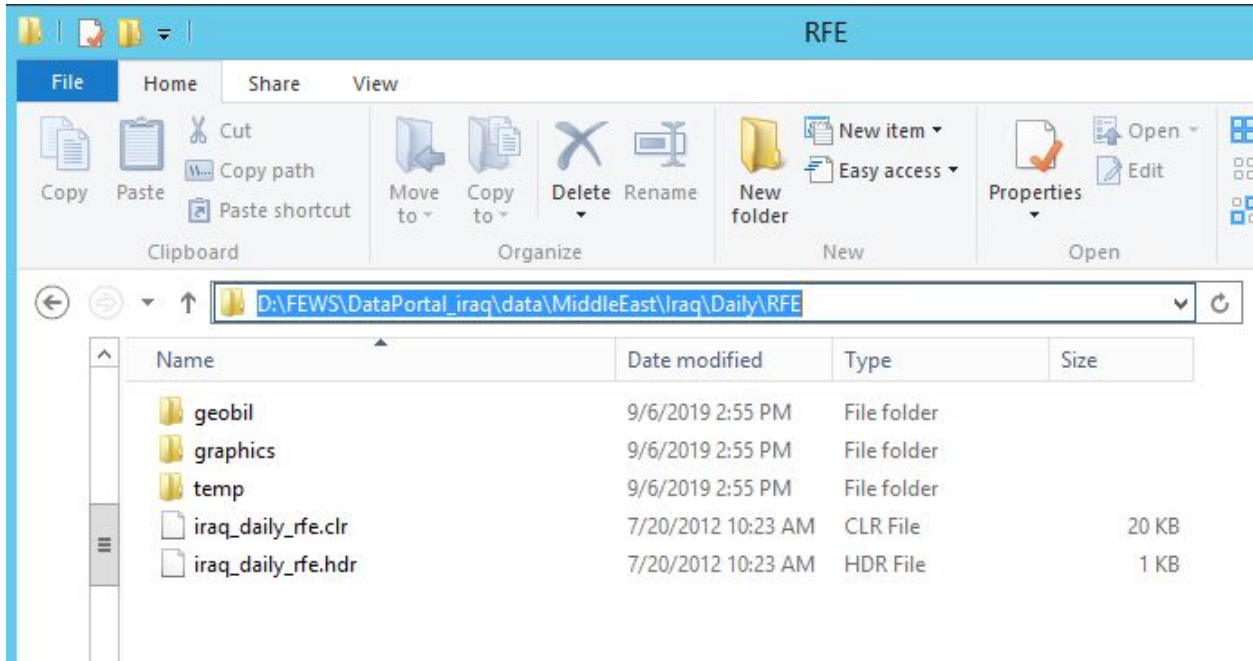
| Folders | Description |
|-------------|--|
| bin | Main and configuration scripts following a folder structure by region, periodicity, product, subproduct. The main scripts are called from windows scheduler tasks to run daily, by dekad end date period to create final products. Also, a <code>main_config.py</code> script is define to define master settings will be used by all the PPG processes. |
| data | Source data, some intermediate data, and final products |
| email_lists | CSV file(s) used to send emails from the python processes. |
| lib | contains scripts with the main functions of the products by periodicity, so |

| | |
|-----------|--|
| | these functions can be re-use by bin scripts. |
| logs | Log files with information about the processes. |
| templates | Files which are used in the processes (e.g. shapefiles, symbology layer files, logos, ArcMap templates, etc.). |
| utilities | External tools used in the PPG processes (e.g. wget) |



Examples:

Daily RFE for Iraq → D:\FEWS\DataPortal_iraq\data\MiddleEast\Iraq\Daily\RFE (region)



In the following sections, the products by periodicity and region/subregions will be described to run it from the Command Prompt for testing and how scheduled tasks have been implemented in the windows scheduled task.

System requirements

For Iraq PPG, the main software requirements are:

- **OS:** Windows
- **Software**
 - ArcGIS Desktop 10.4.1
 - Curl from Git Bash
- **Accounts**
 - 8day - MODIS SCE - <https://urs.earthdata.nasa.gov/>
 - Email account to send PPG log emails (could be a gmail account, mail server: smtp.gmail.com)

Python scripts from Command Prompt

```
Command Prompt
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.
C:\Users\cyoung-pr>D:
D:\>cd FEWS\DataPortal_iraq\bin\asia\middleeast\iraq\daily\rfe
D:\FEWS\DataPortal_iraq\bin\asia\middleeast\iraq\daily\rfe>dir
Volume in drive D is New Volume
Volume Serial Number is 5204-00A9

Directory of D:\FEWS\DataPortal_iraq\bin\asia\middleeast\iraq\daily\rfe

09/06/2019  02:32 PM    <DIR>          .
09/06/2019  02:32 PM    <DIR>          ..
09/06/2019  02:32 PM                2,975  iraq_daily_rfe.py
09/06/2019  02:32 PM                3,122  iraq_daily_rfe_config.py
09/03/2019  02:14 PM                0  __init__.py
               3 File(s)                6,097 bytes
               2 Dir(s)    44,116,017,152 bytes free

D:\FEWS\DataPortal_iraq\bin\asia\middleeast\iraq\daily\rfe>_
```

Batch python scripts for manual recovery or operational processing

The python batch scripts run the different python processes for a FEWS NET product that has had issues, such as bad data, internet connection, etc. during the scheduled task. The GFS Prec has been the most common batch process used because of bad raw data issues. See each dataset product document for more information of the batch scripts created for it.

Location: D:\FEWS\DataPortal_iraq\bin

- allregions_asia_8day_modissnowcoverextent.py
Runs for all the 8-day MODIS SCE regions. **Note:** This script is currently being used in the scheduled task *8-Day_SCE_Asia* at **6:00 PM (CT)** on every Friday of every week.
- allregions_asia_daily_snowdepth_swe.py
Runs for all the daily Snow Depth and SWE regions. **Note:** This script is currently being used in the scheduled task *Daily_Snowdepth_SWE* at **3:02 PM (CT)** every day
- allregions_daily_gfs.py
Run for all the daily GFS Prec regions. **Note:** This script is currently being used just for manual recovery.
- allregions_dekadal_gfspars.py
Run for all the daily GFS ClimPars regions. **Note:** This script is currently being used just for manual recovery.

- `asia_middleeast_daily_rfe_products.py`
Run for all the daily RFE regions. **Note:** This script is currently being used just for manual recovery.

Subscription list for source site/data updates

- GDAS and GFS - (we do not get the GFS data from here, from Kumar and Nicolas) - <https://www.lstsr.noaa.gov/mailman/listinfo/ncep.list.nomads-ftpprd>

Important notes

- For the daily processes, if input arguments (YYYY M D) are not defined, the process will run from the previous day of the run date for Daily RFE. For the Daily GFS and Snow products, the process will run for the current date. However, if the input arguments are defined, the process will run for the run date.
- Log file are set up to append the processes from scheduled and manual runnings, the latest log file information can be found at the end of the log file information in the text files and the notification emails. The **COMPLETE** word indicates that the process was successfully completed.
- Notification email lists to get the information from the python processes are configured based on the target environment (e.g. development, production, or backup). These lists are defined in CSV files under `D:\FEWS\DataPortal_iraq\email_lists`. The development list has the purpose to be used during the development phase, the production when the python process is released to operational mode under the production environment, and the backup to be used as an alternative to have somebody to check the operational process when the maintenance developer is not available.
- In the GMail applications, labels and filters can be created to tag when the processes were completed or not.
Example of completed process.

| | | | | | | | | |
|-------------------------------------|--------------------------|--------------------------|--------------------------|-----------|-------|--------------------|---|-------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/Log files | [EXTERNAL] Iraq PPG DEV - Iraq Daily GFS Prec for Sep 03 2019 - middleea... | Sep 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/Log files | [EXTERNAL] Iraq PPG DEV - Global Daily GFS Prec for Sep 03 2019 - INFO: ... | Sep 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/Log files | [EXTERNAL] Iraq PPG DEV - Global Daily GFS Prec for Sep 04 2019 - INFO: ... | Sep 5 |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/Log files | [EXTERNAL] Iraq PPG DEV - Iraq Daily GFS Prec for Sep 05 2019 - r | Sep 5 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/Log files | [EXTERNAL] Iraq PPG DEV - Global Daily GFS Prec for Sep 05 2019 - INFO: ... | Sep 5 |

[EXTERNAL] Iraq PPG DEV - Iraq Daily GFS Prec for Sep 03 2019 Inbox x FEWS NET/Log files x



fews.logs@gmail.com
to me

Thu, Sep 5, 3:21 PM (3 days ago) ☆ ↶ ⋮

INFO: COMMAND: C:\Python27\ArcGISx6410.3\python.exe D:\FEWS\DataPortal_iraq_cyoung\bin\asia\middleeast\iraq\daily\gfs\iraq_daily_gfs.py 2019 9 3

INFO: PPG DOC: TBD

INFO: LOG PATH: D:\FEWS\DataPortal_iraq_cyoung\logs\20190903\iraq-Daily-GFS-20190903--20190905-152007.log

2019-09-05 15:20:14

----- Process to create BIL for Daily GFS Iraq-----

INFO: Create BIL for Daily GFS Iraq (2019-9-3)

INFO: gfsiraq190903a.bil clipped

INFO: gfsiraq190903b.bil clipped

INFO: gfsiraq190903c.bil clipped

INFO: gfsiraq190903d.bil clipped

INFO: gfsiraq190903e.bil clipped

INFO: gfsiraq190903f.bil clipped

INFO: gfsiraq190903g.bil clipped

INFO: D:\FEWS\DataPortal_iraq_cyoung\data\MiddleEast\Iraq\Daily\GFS\geobil\2019\gfsiraq190903.tar.gz created

INFO: Process to create BIL Daily GFS data for 09 03 2019... **COMPLETE**

Example of incomplete processes

| | | | | | | | |
|--------------------------|--------------------------|--------------------------|-----------|-------|-------------------------|--|-------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/.../INCOMPLETE | [EXTERNAL] Iraq PPG DEV - Iraq Dekadal RFE for Aug dekad 1, 2019 ... | Sep 6 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/.../INCOMPLETE | [EXTERNAL] Iraq PPG DEV - Iraq Dekadal RFE for Aug dekad 2, 2019 ... | Sep 6 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/.../INCOMPLETE | [EXTERNAL] Iraq PPG DEV - Iraq Daily RFE for Mar 06 2016 - RFE for ... | Sep 6 |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | fews.logs | Inbox | FEWS NET/.../INCOMPLETE | [EXTERNAL] Iraq PPG DEV - Iraq Daily GFS Prec for Sep 06 2019 - mi... | Sep 6 |

INFO: Process to create BIL Daily GFS data for 09 06 2019... COMPLETE

INFO: 2019-09-06 14:30:57

INFO: Processing time (HH:MM:SS): 0:00:07.063000

2019-09-06 14:30:58

----- Processing 6 place graphics Iraq GFS -----

INFO: Creat6 6 days graph for Daily GFS Iraq (2019-9-6)

INFO: Getting Iraq Daily GFS data and extracting for graphics.

INFO: Publishing Iraq Daily GFS Grids Data to map template.

INFO: Unzipping geobil file D:\FEWS\DataPortal_iraq_cyoung\data\MiddleEast\Iraq\Daily\GFS\geobil\2019\gfsiraq190906.tar.gz

INFO: ArcMap template: D:\FEWS\DataPortal_iraq_cyoung\templates\iraq_6_v3.mxd

INFO: LYR input: D:\FEWS\DataPortal_iraq_cyoung\templates\sym\daily_gfs_v3.lyr

INFO: D:\FEWS\DataPortal_iraq_cyoung\data\MiddleEast\Iraq\Daily\GFS\graphics\gfsiraq190906.png created

INFO: gfsiraq190906.png copied to web at D:\Stornext\scienceweb\development\fews\web\asia\middleeast\iraq\daily\gfs-prec\graphics

INFO: gfsiraq190906.png copied to web at D:\NetApp\sharedwebfs1\development\fews\web\asia\middleeast\iraq\daily\gfs-prec\graphics

ERROR: Arc GP Error Msg: Executing: Delete D:\FEWS\DataPortal_iraq_cyoung\data\MiddleEast\Iraq\Daily\GFS\temp\gfsiraq190906.gil RasterDataset

Start Time: Fri Sep 06 14:30:57 2019

Succeeded at Fri Sep 06 14:30:57 2019 (Elapsed Time: 0.04 seconds)

PYTHON ERRORS:

Traceback Info:

File "D:\FEWS\DataPortal_iraq_cyoung\lib\daily_gfs_process.py", line 1065, in makeSix
if os.path.exists(pdf_file_name):

Error Info:

<type 'exceptions.NameError': global name 'pdf_file_name' is not defined

ERROR: Process for Daily GFS ... INCOMPLETE

- Scheduled tasks could be defined the folder “Iraq Tasks” in the Windows Task Scheduler.
 - A backup of all the scheduled tasks as XML files for “Iraq NET Tasks” could be created for easy migration from one system to another. They can be created under an Iraq PPG folder called “sch_tasks”
- Since ArcGIS version 10.x, Python can be run using the 64-bit or 32-bit program. By default, the 64-bit version is used by ArcGIS when running the scripts from the command prompt or the Windows task scheduler. Some issues have been found when running the 64-bit program with scripts using ArcMap templates with customized labels and horizontal legend styles. To solve this issue, the python scripts needs to be run using the 32-bit program.
- Each process has an associated configuration python script (*_config.py) file. This file contains information related to the region may include location of files, GIS data used during the process, filenames and extensions needed, notification list to email the log file information, and additional information that is used in the /lib/ python scripts.

Operational Processes

- Rainfall Estimate (RFE)
- Global Forecast System (GFS) Precipitation
- GFS climate parameters (GFSPars)
- Temperature Averages and Anomalies using GFSPars
- Snow Water Equivalent
- Snow Depth
- MODIS Snow Cover Extent