**Model of Model Input Data Acquiring and Processing and Output**

**Input Data**

| **Data** | **Developed by** | **Resolution** | **Updated** | **Download Site** |
| --- | --- | --- | --- | --- |
| **Global Watershed** | **WRI** |  | **Every year** | <https://www.wri.org/resources/data-sets/aqueduct-global-maps-30-data> |
| **GFMS output**  **(Flood depth above threshold)** | **UMD & NASA** | **12km** | **Updated every 3 hours** | <http://eagle2.umd.edu/flood/download/> |
| **GloFas Output** | **EC & ECMWF** |  | **Updated every day** |  |
| **HWRF** | **NOAA** | **6km** | **Updated evey 6 hour for the forecasted tropical cyclone** | [**https://www.emc.ncep.noaa.gov/gc\_wmb/vxt/HWRF/about.php?branch=link**](https://www.emc.ncep.noaa.gov/gc_wmb/vxt/HWRF/about.php?branch=link) |
| **DFO** | **DFO** | **250m** | **Updated every day** | https://floodmap.modaps.eosdis.nasa.gov/index.php |
| **VIIRS** | **NOAA** | **375m** | **Updated every day** | [**https://www.ssec.wisc.edu/flood-map-demo/ftp-link**](https://www.ssec.wisc.edu/flood-map-demo/ftp-link) |

**Output:** https://js-157-200.jetstream-cloud.org/ModelofModels/

**Codes**: <https://github.com/Global-Flood-Assessment/ModelOfModels/tree/master/data>

1. **Global Watershed**
2. The global watershed developed by WRI is downloaded manually from <https://www.wri.org/resources/data-sets/aqueduct-global-maps-30-data>
3. The folder named “Y2019M07D12\_Aqueduct30\_V01” will be downloaded and the geodatabase the study used is within the subfolder: Y2019M07D12\_Aqueduct30\_V01\Y2019M07D12\_Aqueduct30\_V01\baseline\annual\arcmap\y2019m07d12\_aqueduct30\_v01.gdb
4. The shapefile within this geodatabase is dissolved using attribute “pfaf\_id” which will be used to integrate GFMS and GloFas output after projection.
5. Along with pfaf\_id, other attributes that are used and joined are :

gid\_0 : Three letter country code renamed as ISO

name\_0: Country name renamed as ADMIN0

name\_1: Major Administrative area name renamed as ADMIN1

rfr\_score: Riverine Flood Risk score

cfr\_score: Coastal Flood Risk score

1. The final attributes with Field Name: { pfaf\_id, ISO, Admin0, Admin1, rfr\_score, cfr\_score} is saved as “***Attributes.csv***” and uploaded in GitHub. <https://github.com/Global-Flood-Assessment/ModelOfModels/blob/master/Flood_Severity_Calculation/Attributes.csv>

\* Features with -9999 pfaf\_id is removed. For the features with missing gid\_0, name\_0 and name\_1, the shapefile is overlaid with global boundary map and name is given manually based on where the centroid of the watersheds resides on.

1. **GFMS output (Flood depth above threshold ) download and processing**

Output file: **Flood\_by\_storm\_*yyyymmddhh*.csv at** <https://js-169-84.jetstream-cloud.org/ModelofModels/gfms/>

File contains the GFMS output data integrated with global watershed with fieldname:

pfaf\_id: Global Watershed ID

GFMS\_TotalArea\_km: Area of flooded watershed in square kilometer unit

GFMS\_%Area: Percentage of flooded area

GFMS\_MeanDepth: mean depth of flood above threshold within the watershed

GFMS\_MaxDepth: Max depth of flood above threshold within the watershed

GFMS\_Duration: Cumulative Duration in hours if watershed (more than 100 sqkm) is flooded

1. **GloFas output download and Processing**

Output file: **threspoints\_*yyyymmdd*00.csv/geojson/xlsx. at** <https://js-169-84.jetstream-cloud.org/ModelofModels/glofas/>

File contains the GloFas output data integrated with global watershed with field name:

Point\_No: The point no of the station

Station: Station name

Basin: the name of the river basin where station is placed

Country: The name of country wherestation resides

Lat: Latitudinal position of the station

Lon: Longitudinal position of the station

Upstream\_area: The upstream area of the basin from station

Forecast\_Date: The flood forecasted date and time

max\_EPS: ensemble predictions (EPS) of flood event with return period (2/5/20)years

GloFAS\_2yr: EPS of 2 year return period

GloFAS\_5yr: EPS of 5 year return period

GloFAS\_20y: EPS of 20 year return period

Alert\_level: Alert level of the flood (1-3)

Days\_until\_peak:

pfaf\_id: Global Watershed ID

Note: Within watershed features (pfaf\_id) more than one station may reside.

1. **HWRF ouput download and Processing**

The python programming for the download of all rainfall data and integration of it to the WRI Watershed is uploaded in GitHub and can be found here: <https://github.com/Global-Flood-Assessment/ModelOfModels/tree/master/HWRF_Rainfall_Processing>.

Output file: 1. **hwrf.*yyyymmddhh*rainfall.csv at** <https://js-169-84.jetstream-cloud.org/ModelofModels/HWRF/HWRF_summary>

2. **hwrf.*yyyymmddhh*rainfall.csv at** https://js-169-84.jetstream-cloud.org/ModelofModels/HWRF/HWRF\_image/

The csv file contains the attributes with field name:

pfaf\_id: Global watershed ID

Rain\_TotalArea\_km: Area of watershed in square kilometer unit that gets the precipitation

perc\_Area: Percentage area of the watershed that gets the precipitation

MeanRain: Mean Rainfall in unit inches within the watershed

MaxRain: MaximumRainfall in unit inches within the watershed

1. **Flood Severity Calculation**

Python File: **Flood\_Severity\_Calculation.py** uploaded at <https://github.com/Global-Flood-Assessment/ModelOfModels/blob/master/Flood_Severity_Calculation/Flood_Severity_Calculation.py>

1. Read the CSV files from GFMS output (step 2) as ***GFMS\_Table.csv***
2. Assign score and to each flood attribute based on the weightage provided in ***weightage.csv*** and add the score together.
3. Read the GloFas output (step 3) as ***GloFas\_Table.csv***.
4. Assign score for each flood attribute (GloFAS\_2yr, GloFAS\_5yr, GloFAS\_20y, Alert\_level, Days\_until\_peak) output based on the weightage provided in ***weightage.csv*** and add the score together.
5. The hazard score form GloFas for each watershed (pfaf\_id) is the average of the score of all station within same watershed.
6. Read the CSV file with attributes from Global Watershed i.e. ***Attributes.csv.*** (from Step 1)
7. Join all three CSV files based on pfaf\_id. The total hazard score is summation of hazard score from both model. Double the hazard score from the respective model if any event is missed by any model.
8. Calculate **Severity** using a Cumulative Distribution Function (CDF) such that the total dynamic hazard score from both models are fitted with a logarithmic value of scaled RFR score or scaled CFR score whichever maximum as mean and unit standard deviation
9. Use severity to derive **Alert** message as: “Information” when 0% < Severity < 35%; “Advisory” when 35% ≤ Severity < 60%; “Watch” when 60% ≤ Severity < 80% and; “Warning” when Severity ≥ 80%.
10. Write the output ***Final\_Attributes\_yyyymmdd.csv*** and ***Attributes\_clean\_yyyymmdd.csv*** file.
11. Write the output file ***GloFas\_error.csv*** if any attributes of station from the GloFas have error in it. That data of that particular station data will be skipped and then, the number, the name of station, associated watershed id and the first encountered error will be listed row wise.

***weightage.csv***

This is the csv file provided with limit criteria/ initial weightage for attribute from GFMS and GloFas and, minimum and maximum score assigned to calculated the hazard score and is uploaded at <https://github.com/Global-Flood-Assessment/ModelOfModels/blob/master/Flood_Severity_Calculation/Weightage.csv>. The table have following fieldname: { GFMS\_Area\_wt, GFMS\_Area\_Min\_pt, GFMS\_Area\_max\_pt, GFMS\_Meandepth\_wt, GFMS\_Meandepth\_Minpt, GFMS\_Meandepth\_Maxpt, GFMS\_Maxdepth\_wt, GFMS\_Maxdepth\_Minpt, GFMS\_Maxdepth\_Maxpt, GFMS\_Duration\_wt, GFMS\_Duration\_Minpt, GFMS\_Duration\_Maxpt, EPS\_Twoyear\_wt, EPS\_Fiveyear\_wt, EPS\_Twtyyear\_wt, Alert\_score}**.** The values for these field name is provided based on the Weighting criteria below

| Product Description | Initial Weighting |
| --- | --- |
| The total area of watershed impacted by flood | 1 pt for every 1000sqkm, Max =10 |
| Percentage of watershed area impacted from flood | 1 pt for every 5%, Max = 10 (eg. 66% = 10) |
| The mean depth of flood above the threshold in a watershed in mm | 1 pt for every 10 mm, Max = 10 (eg. 56 mm = 5.6) |
| Max depth of flood above threshold in a watershed in mm | 1 pt for every 10 mm, Max =10 (eg. 890 mm = 8.9) |
| Number of 3-hr intervals a specific area has been flooded (at least 100 square km overlap in each interval) | Continuous days of at least 100 sqkm overlap, 1 per day, Max= 10 (eg. 66 hrs = 2.75) |
| EPS greater than threshold exceedance for 2, 5 and 20 year return period flood event (%) | 10 pt for 100% Max = 10 (eg. 66% = 6.6) |
| Alert Level 1 2 and 3 with 3 greatest value | 1, 2 and 3 = 3, 7 and 10 respectively |
| Number of days until the peak forecast arrives at an observation point | Weight in days where 1 =10, 2=9, … 10 or greater = 1 |

1. **Flood Severity Calculation including HWRF and GFMS and GloFas**

Python File: MoM+HWRF\_severity.ipynb at <https://github.com/Global-Flood-Assessment/ModelOfModels/tree/master/MOM_and_HWRF_Integration_and_Flood_Severity>

1. Repeat all the steps from Flood Severity Calculation from (i) to (vii) and (xi). The hazard Score is replace by the name **MOM\_Score**.
2. Read the CSV files from HWRF output (step 4) as ***HWRF\_Table.csv***
3. Assign score and to each rainfall attribute based on the weightage provided in HRRF\_***Weightage.csv*** and add the score together and name the field as “**HWRFTot\_Score**”
4. Join this HWRF\_table with score to the csv file from step i.
5. Compare the **MOM\_Score** and **HWRFTot\_Score** and assign the field “**Hazard\_Score**” with maximum among them.
6. If the **HWRFTot\_Score > MOM\_Score** assign the field “**Flag**”=1.
7. Calculate **Severity** using a Cumulative Distribution Function (CDF) such that the Hazard\_Score are fitted with a logarithmic value of scaled RFR score or scaled CFR score whichever maximum as mean and unit standard deviation
8. Use severity to derive **Alert** message as: “Information” when 0% < Severity < 35%; “Advisory” when 35% ≤ Severity < 60%; “Watch” when 60% ≤ Severity < 80% and; “Warning” when Severity ≥ 80%.
9. Write the output ***Final\_Attributes\_yyyymmddhhHWRFUpdated.csv*** and ***Attributes\_clean\_yyyymmddhhHWRFUpdated.csv*** file.

***HWRF\_Weightage.csv***

This is the csv file provided with limit criteria/ initial weightage for attribute from HWRF and, minimum and maximum score assigned to calculated the h **HWRFTot\_Score** and is uploaded at <https://github.com/Global-Flood-Assessment/ModelOfModels/blob/master/MOM_and_HWRF_Integration_and_Flood_Severity/HWRF_Weightage.csv>. The table have following fieldname: { HWRF\_Area\_wt, HWRF\_Area\_Min\_pt, HWRF\_Area\_max\_pt, HWRF\_percArea\_wt, HWRF\_percArea\_Min\_pt, HWRF\_percArea\_max\_pt, HWRF\_MeanRain\_minwt, HWRF\_MeanRain\_increment, HWRF\_MeanRain\_Minpt, HWRF\_MeanRain\_Maxpt, HWRF\_MaxRain\_minwt, HWRF\_MaxRain\_increment, HWRF\_MaxRain\_Minpt, HWRF\_MaxRain\_Maxpt }**.** The values for these field name is provided based on the Weighting criteria below.

| Product Description | Weighting and Score |
| --- | --- |
| The total area of watershed impacted by the rain (Rain\_TotalArea\_km) | 1 pt for every 1000 sqkm, Max=10 |
| Percentage of watershed area impacted by rain (perc\_Area) | 1 pt for 5% are aflooded, Max=10 |
| The mean rainfall in a watershed, inches (MeanRain) | 1pt for 2 in rain and add 1 pt for every 0.5 inch rain increment, Max=10 (e.g. 4.5in =6) |
| The maximum rainfall in a watershed, inches  (MaxRain) | 1pt for 4 in rain and add 1 pt for every 1 inch rain increment, Max=10 (e.g. 4.5in =1.5) |

The GFMS GloFAS and HWRF Integration approach is also shown in the flowchart below.

Diagram

Description automatically generated

1. **DFO Data download and processing**

The python programming for the download of global flood observed data and integration of it to the WRI Watershed is uploaded in GitHub and can be found here:

https://github.com/Global-Flood-Assessment/ModelOfModels/tree/master/DFO\_Processing.

Output file: 1. **DFO\_*yyyymmdd*.csv at** <https://js-169-84.jetstream-cloud.org/ModelofModels/DFO/DFO_summary>

2. **DFO\_*yyyymmdd*.csv at** https://js-169-84.jetstream-cloud.org/ModelofModels/DFO/DFO\_image

The csv file contains the attributes with field name:

pfaf\_id: Global watershed ID

1-Day\_TotalArea\_km2: Area of watershed in square kilometer unit that is flooded based on one day observed data

1-Day\_perc\_Area: Percentage area of the watershed that gets flooded based on one day observed data

1-Day\_CS\_TotalArea\_km2: Area of watershed in square kilometer unit that is flooded based on one day observed data with cloud shadow masking applied

1-Day\_CS\_perc\_Area: Percentage area of the watershed that gets flooded based on one day observed data with cloud shadow masking applied

2-Day\_TotalArea\_km2: Area of watershed in square kilometer unit that is flooded based on two day observed data and cloud shadow masking is also applied

2-Day\_perc\_Area: Percentage area of the watershed that gets flooded based on two day observed data and cloud shadow masking is also applied

3-Day\_TotalArea\_km2: Area of watershed in square kilometer unit that is flooded based on three day observed data and cloud shadow masking is also applied

3-Day\_perc\_Area: Percentage area of the watershed that gets flooded based on three day observed data and cloud shadow masking is also applied

1. **Flood Severity Calculation including MOM output (HWRF, GFMS, and GloFas) and DFO**

Python File: MoM+DFO.ipynb at:

https://github.com/Global-Flood-Assessment/ModelOfModels/blob/master/DFO\_Integration\_with\_MOM

1. Read ***Final\_Attributes\_yyyymmddhhHWRFUpdated.csv* as MOM File** and **DFO\_*yyyymmdd*.csv as DFO File**.
2. On the DFO file assign score to each DFO attribute (excluding 1-Day\_TotalArea\_km2 and 1-Day\_perc\_Area) based on the weightage provided in **DFO**\_***Weightage.csv*** and add the score together and name the field as “**DFOTotal\_Score**”
3. Join this DFO file with score to the MOM file via pfaf\_id.
4. Compare the **DFOTotal\_Score** and **Hazard\_Score** and update the field “**Hazard\_Score**” with maximum among them.
5. If the **DFOTotal\_Score > Hazard\_Score** update the field “**Flag**”=2.
6. Calculate **Severity** using a Cumulative Distribution Function (CDF) such that the Hazard\_Score are fitted with a logarithmic value of scaled RFR score or scaled CFR score whichever maximum as mean and unit standard deviation
7. Use severity to derive **Alert** message as: “Information” when 0% < Severity < 35%; “Advisory” when 35% ≤ Severity < 60%; “Watch” when 60% ≤ Severity < 80% and; “Warning” when Severity ≥ 80%.
8. Write the output ***Final\_Attributes\_yyyymmddhhMOM+DFOUpdated.csv*** and ***Attributes\_clean\_yyyymmddhhMOM+DFOUpdated.csv*** file.

***Weightage\_DFO.csv***

This is the csv file provided with limit criteria/ initial weightage for attribute from DFO and, minimum and maximum score assigned to calculate the **DFOTotal\_Score** and is uploaded at:

<https://github.com/Global-Flood-Assessment/ModelOfModels/blob/master/DFO_Integration_with_MOM/Weightage_DFO.csv>.

The table have following fieldname: { DFO\_Area\_wt, DFO\_Area\_Min\_pt, DFO\_Area\_max\_pt, DFO\_percArea\_wt, DFO\_percArea\_Minpt, DFO\_percArea\_Maxpt, one\_Day\_Multiplier, two\_Day\_Multiplier, three\_Day\_Multiplier}**.** The values for these field name is provided based on the Weighting criteria below.

| Product Description | Weighting and Score |
| --- | --- |
| 1-Day\_CS\_TotalArea\_km2 | 1 pt for every 100 sqkm, Max=10 |
| 1-Day\_CS\_perc\_Area | 1 pt for 1% area flooded, Max=10 |
| 2-Day\_TotalArea\_km2 | 1.5 pt for every 100 sqkm, Max=15 |
| 2-Day\_perc\_Area | 1.5 pt for every 1% area, Max=15 |
| 3-Day\_TotalArea\_km2 | 2.5 pt for every 100 sqkm, Max=25 |
| 3-Day\_perc\_Area | 2.5 pt for every 1% area, Max=25 |

1. **VIIRS Data download and processing**

The python programming for the download of global flood observed data and integration of it to the WRI Watershed is uploaded in GitHub and can be found here:

https://github.com/Global-Flood-Assessment/ModelOfModels/tree/master/VIIRS\_Processing.

Output file: 1. **VIIRS\_Flood\_*yyyymmdd*.csv at** <https://js-169-84.jetstream-cloud.org/ModelofModels/VIIRS/VIIRS_summary>

2. **VIIRS\_1day\_composite*yyyymmdd\_flood*.tiff at** <https://js-169-84.jetstream-cloud.org/ModelofModels/VIIRS/VIIRS_image>

3. **VIIRS\_5day\_composite*yyyymmdd\_flood*.tiff at** <https://js-169-84.jetstream-cloud.org/ModelofModels/VIIRS/VIIRS_image>

The csv file contains the attributes with field name:

pfaf\_id: Global watershed ID

onedayFlood\_Area\_km: Area of watershed in square kilometer unit that is flooded based on one day observed data

onedayperc\_Area: Percentage area of the watershed that gets flooded based on one day observed data

fivedayFlood\_Area\_km: Area of watershed in square kilometer unit that is flooded based on five day composite observed data with cloud shadow masking applied

fivedayperc\_Area: Percentage area of the watershed that gets flooded based on five day composite observed data with cloud shadow masking applied

1. **Flood Severity Calculation including MOM output (HWRF, GFMS, and GloFas), DFO and VIIRS**

Python File: MoM+VIIRS.ipynb at:

https://github.com/Global-Flood-Assessment/ModelOfModels/blob/master/VIIRS+MOM

1. Read ***Final\_Attributes\_yyyymmddhh\_MOM+DFOUpdated.csv* as MOM+DFO File** and **VIIRS\_Flood\_*yyyymmdd*.csv as VIIRS File**.
2. On the VIIRS file assign score to each VIIRS attribute based on the weightage provided in **VIIRS**\_***Weightage.csv*** and add the score together and name the field as “**VIIRSTotal\_Score**”
3. Join thisVIIRS file with score to the MOM+DFO file via pfaf\_id.
4. Compare the **VIIRSTotal\_Score** and **Hazard\_Score** and update the field “**Hazard\_Score**” with maximum among them.
5. If the **VIIRSTotal\_Score > Hazard\_Score** update the field “**Flag**”=3.
6. Calculate **Severity** using a Cumulative Distribution Function (CDF) such that the Hazard\_Score are fitted with a logarithmic value of scaled RFR score or scaled CFR score whichever maximum as mean and unit standard deviation
7. Use severity to derive **Alert** message as: “Information” when 0% < Severity < 35%; “Advisory” when 35% ≤ Severity < 60%; “Watch” when 60% ≤ Severity < 80% and; “Warning” when Severity ≥ 80%.
8. Write the output ***Final\_Attributes\_yyyymmddhhMOM+DFO+VIIRSUpdated.csv*** and ***Attributes\_clean\_yyyymmddhhMOM+DFO+VIIRSUpdated.csv*** file.

***VIIRS\_Weightage.csv***

This is the csv file provided with limit criteria/ initial weightage for attribute from VIIRS Flood and, minimum and maximum score assigned to calculate the **VIIRSTotal\_Score** and is uploaded at:

<https://github.com/Global-Flood-Assessment/ModelOfModels/tree/master/VIIRS%2BMOM/VIIRS_Weightages.csv>.

The table have following fieldname: { VIIRS\_Area\_wt, VIIRS\_Area\_Min\_pt, VIIRS\_Area\_max\_pt, VIIRS\_percArea\_wt, VIIRS\_percArea\_Minpt, VIIRS\_percArea\_Maxpt, one\_Day\_Multiplier, five\_Day\_Multiplier}**.** The values for these field names are provided based on the Weighting criteria below.

| Product Description | Weighting and Score |
| --- | --- |
| onedayFlood\_Area\_km | 1.5 pt for every 100 sqkm, Max=15 |
| onedayperc\_Area | 1.5 pt for 1% area flooded, Max=15 |
| fivedayFlood\_Area\_km | 3.5 pt for every 100 sqkm, Max=35 |
| fivedayperc\_Area | 3.5 pt for every 1% area, Max=35 |

The summary of field name and description that are present in the “***Final\_Attributes\_yyyymmddhhMOM+DFO+VIIRSUpdated.csv”***

| Field Name | Description |
| --- | --- |
| pfaf\_id | Global Watershed ID |
| FID | ID generated by GIS |
| area\_km2 | Area of the watershed in sqkm |
| ISO | Three letter country code |
| Admin0 | Name of the country where the centroid of the watershed lies |
| Admin1 | Name of the major administration boundary of the country |
| rfr\_score | Riverine Flood risk of the watershed |
| cfr\_score | Coastal Flood risk of the watershed |
| Resilience\_Index | Lack of Resilience Index of the country from PDC |
| NormalizedLackofResilience | Normalized value of Resilience Index |
| Alert\_level | Alert level of the observing points from GloFas |
| Days\_until\_peak | Days until peak of the flood reach to the observing point from GloFas |
| GloFAS\_2yr | Probability that flood of return period 2 year will reach from GloFas |
| GloFAS\_5yr | Probability that flood of return period 5 year will reach from GloFas |
| GloFAS\_20yr | Probability that flood of return period 20 year will reach from GloFas |
| Alert\_Score | Score for the Alert\_level from GloFas |
| PeakArrivalScore | Score for the Days\_until\_peak from GloFas |
| TwoYScore | Score for the GloFAS\_2yr flood probability |
| FiveYScore | Score for the GloFAS\_5yr flood probability |
| TwtyYScore | Score for the GloFAS\_20yr flood probability |
| Sum\_Score\_x | Summation of all scores from the GloFAs\* |
| GFMS\_TotalArea\_km | Area of flooded watershed in square kilometer unit due to flood depth above threshold from GFMS |
| GFMS\_perc\_Area | Percentage area of the flooded watershed due to flood depth above threshold from GFMS |
| GFMS\_MeanDepth | Mean Depth of flood above threshold from GFMS within the watershed |
| GFMS\_MaxDepth | Max Depth of flood above threshold from GFMS within the watershed |
| GFMS\_Duration | Cumulative Duration in hours if watershed (more than 100 sqkm) is flooded from flood above threshold from GFMS |
| GFMS\_area\_score | Score for the GFMS\_TotalArea\_km |
| GFMS\_perc\_area\_score | Score for the GFMS\_perc\_Area |
| MeanD\_Score | Score for the GFMS\_MeanDepth |
| MaxD\_Score | Score for the GFMS\_MaxDepth |
| Duration\_Score | Score for the GFMS\_Duration |
| Sum\_Score\_y | Summation of all the scores from GFMS\* |
| MOM\_Score | Summation of Sum\_Score\_x and Sum\_Score\_y |
| Hazard\_Score | Maximum of MOM\_Score, HWRFTot\_Score, DFOTotal\_Score or VIIRSTotal\_Score |
| Rain\_TotalArea\_km | Area of the watershed impacted by the rainfall from HWRF |
| perc\_Area | Percantage of the area of the watershed impacted by the rainfall from HWRF |
| MeanRain | Mean Rainfall within the watershed in inches |
| MaxRain | Maximum Rainfall within the watershed in inches |
| HWRF\_area\_score | Score for the Rain\_TotalArea\_km from HWRF |
| HWRF\_percarea\_score | Score for the perc\_Area from HWRF |
| MeanRain\_Score | Score for the MeanRain from HWRF |
| MaxRain\_Score | Score for the MaxRain from HWRF |
| HWRFTot\_Score | Summation of all the scores from HWRF |
| Flag | Tag (1, 2 and 3) for the updated hazard score due to HWRF, DFO and VIIRS respectively |
| 1-Day\_TotalArea\_km2 | Area of watershed in square kilometer unit that is flooded based on one day observed data |
| 1-Day\_perc\_Area | Percentage area of watershed that is flooded based on one day observed data from DFO |
| 1-Day\_CS\_TotalArea\_km2 | Area of watershed in square kilometer unit that is flooded based on one day observed data with cloud shadow masking applied from DFO |
| 1-Day\_CS\_perc\_Area | Percentage area of watershed that is flooded based on one day observed data with cloud shadow masking applied from DFO |
| 2-Day\_TotalArea\_km2 | Area of watershed in square kilometer unit that is flooded based on two day observed data and cloud shadow masking is applied from DFO |
| 2-Day\_perc\_Area | Percentage area of watershed that is flooded based on two day observed data and cloud shadow masking is applied from DFO |
| 3-Day\_TotalArea\_km2 | Area of watershed in square kilometer unit that is flooded based on three day observed data and cloud shadow masking is applied from DFO |
| 3-Day\_perc\_Area | Percentage area of watershed that is flooded based on two day observed data and cloud shadow masking is applied from DFO |
| DFO\_area\_1day\_score | Score for 1-Day\_CS\_TotalArea\_km2 from DFO |
| DFO\_percarea\_1day\_score | Score for 1-Day\_CS\_perc\_Area from DFO |
| DFO\_area\_2day\_score | Score for 2-Day\_TotalArea\_km2 from DFO |
| DFO\_percarea\_2day\_score | Score for 2-Day\_perc Area from DFO |
| DFO\_area\_3day\_score | Score for 3-Day\_TotalArea\_km2 from DFO |
| DFO\_percarea\_3day\_score | Score for 3-Day\_perc Area from DFO |
| DFOTotal\_Score | Summation of the scores from DFO |
| onedayFlood\_Area\_km | Area of watershed in square kilometer unit that is flooded based on one day observed data of VIIRS |
| onedayperc\_Area | Percentage area of watershed that is flooded based on one day observed data of VIIRS |
| fivedayFlood\_Area\_km | Area of watershed in square kilometer unit that is flooded based on five day composite observed data of VIIRS |
| fivedayperc\_Area | Percentage area of watershed that is flooded based on five day composite observed data of VIIRS |
| VIIRS\_area\_1day\_score | Score for onedayFlood\_Area\_km from VIIRS |
| VIIRS\_percarea\_1day\_score | Score for onedayperc\_Area from VIIRS |
| VIIRS\_area\_5day\_score | Score for fivedayFlood\_Area\_km from VIIRS |
| VIIRS\_percarea\_5day\_score | Score for fivedayperc\_Area from VIIRS |
| VIIRSTotal\_Score | Summation of all the scores from VIIRS |
| Scaled\_Riverine\_Risk | Scaled rfr\_score |
| Scaled\_Coastal\_Risk | Scaled cfr\_score |
| Severity | Severity value of the watershed based on Hazard\_Score, and maximum of Scaled\_Riverine\_Risk and Scaled\_Coastal\_Risk |
| Alert | Flood alert generated for the watershed based on the Severity |

### Github Repos:

MoM development at IU: <https://github.com/Global-Flood-Assessment/ModelOfModels>

MoM Production at PDC: <https://github.com/Global-Flood-Assessment/MoMProduction>

**Notes:**

In IU server: MoM runs with two different watershed shape files

* GloFAS, GFMS, GFO: wastershed\_prj\_latlon.shp – 2020-04-23
* HWRF, VIIRS: Watershed\_pfaf\_id.shp – 2021-02-18

In PDC server: MoM runs with Watershed\_pfaf\_id.shp for all the procedures

We are currently working on updating the IU server, <https://github.com/Global-Flood-Assessment/ModelOfModels/issues/23>