

## Forecast Flash Flood Threat (FFFT)

Forecasters should note that unlike IFFT and PFFT that use merged Mean Areal Precipitation generated from bias adjusted satellite (or radar) measurements (Merged MAP) or gauge surface measurements (Gauge MAP), Forecast Flash Flood Threat (FFFT) estimation uses forecasts mean areal precipitation generated from ALADIN (FMAP). These two quite different kinds of source of quantitative precipitation. Therefore, forecasters must analyse both types of products carefully.

In the images, an approximate measure of uncertainty in the FFFT estimates is indicated by the ranges in the color scale (with yellow indicating the range of values that are less likely to be of concern for flash flooding and with orange and red indicating progressively higher risk of flooding for the sub-basin of interest). FFFT carries significant uncertainty and it is offered as a baseline product that must be carefully evaluated by the forecaster in real-time.

Descriptions of the products can be accessed by clicking on the “Product Description” button at the bottom of the FFGS Products Console.

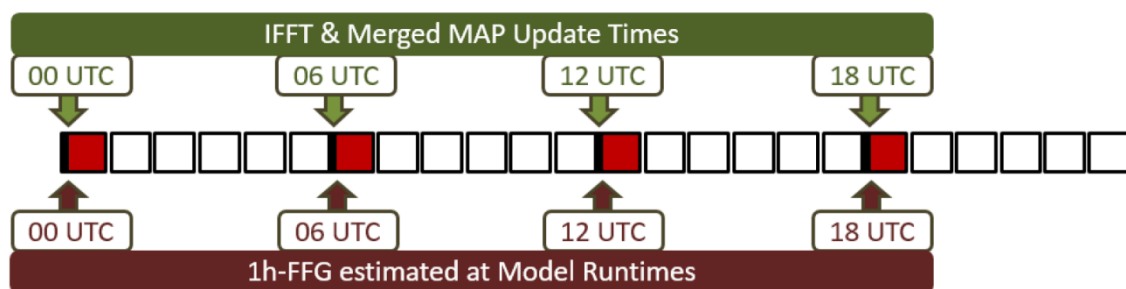
Values of FFFT (3-, and 6-hour) are not displayed in the graphical products or provided in the data text files for basins with an accumulated drainage area greater than 2,000 km<sup>2</sup>.

Basins meeting these criteria are shown in grey coloured shading in the system products and as -999.00 in the text files.

FFFT provides the forecaster with an idea of regions forecasted to be of concern for flash flooding based on the difference of FMAP forecasters of mean areal rainfall and the corresponding current FFG. In the computation of FFFT products, the 1-, 3-, and 6-hour FMAP products are all considered with current corresponding FFG products. These products are updated at 00-hr, 06-hr, 12-hr and 18-hr UTC.

### 1.1. 1-Hour Forecast Flash Flood Threat (1 hr-FFFT)

As it shown in figure below, 1-Hour FFFT is estimated and updated at 00 UTC, 06 UTC, 12 UTC and 18 UTC. FFFT 01-hr: Difference of 01-hr FMAP for current model processing hour and current 01-hr FFG (mm/hr).



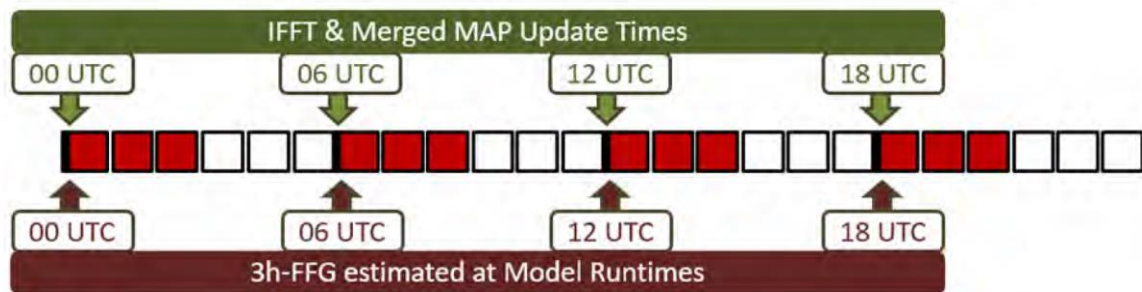
1-hr FFFT estimation scheme

$$1h\ FFFT_t = 1h\ FMAP_t - 1h\ FFG_t, \text{ where } t = 00, 06, 12 \text{ and } 18\ \text{UTC}$$

The 01-hr FFFT at 00:00 UTC = the difference between the 01-hr Forecasted MAP from 00:00 UTC and the 01-hr FFG from 00:00 UTC, valid at 01:00 UTC. The 01-hr FFFT at 06:00 UTC = the difference between the 01-hr Forecasted MAP from 06:00 UTC and the 01-hr FFG from 06:00 UTC, valid at 07:00 UTC. The 01-hr FFFT at 12:00 UTC = the difference between the 01-hr Forecasted MAP from 12:00 UTC and the 01-hr FFG from 12:00 UTC, valid at 13:00 UTC. The 01-hr FFFT at 18:00 UTC = the difference between the 01-hr Forecasted MAP from 18:00 UTC and the 01-hr FFG from 18:00 UTC, valid at 19:00 UTC.

### 1.2. 3-Hour Forecast Flash Flood Threat (3 hr-FFFT)

As it is shown in figure below, 3-Hour FFFT is estimated and updated at 00 UTC, 06 UTC, 12 UTC and 18 UTC. FFFT 03-hr: Difference of 03-hr FMAP for current model processing hour and current 03-hr FFG (mm/3hr).

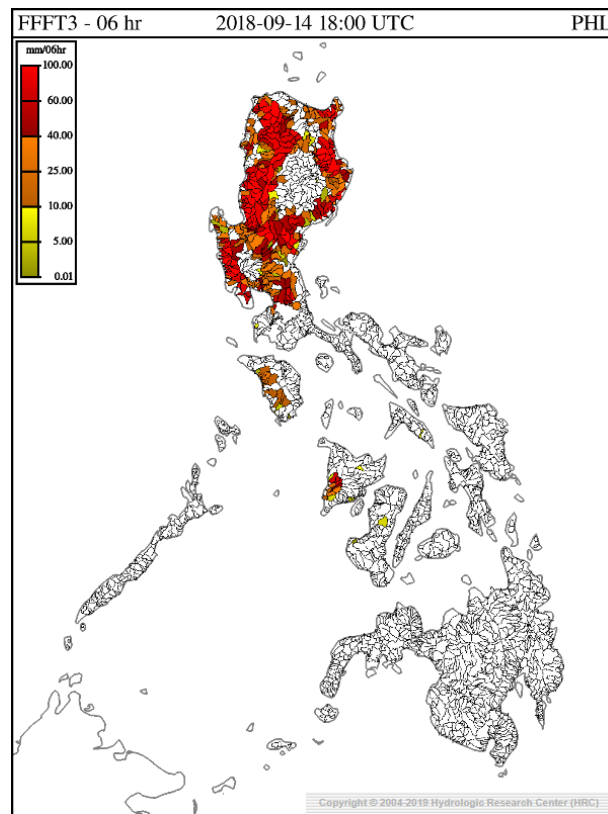


3-hr FFFT estimation scheme

$$3h\ FFFT_t = 3h\ FMAP_t - 3h\ FFG_t, \text{ where } t = 00, 06, 12 \text{ and } 18\ \text{UTC}$$

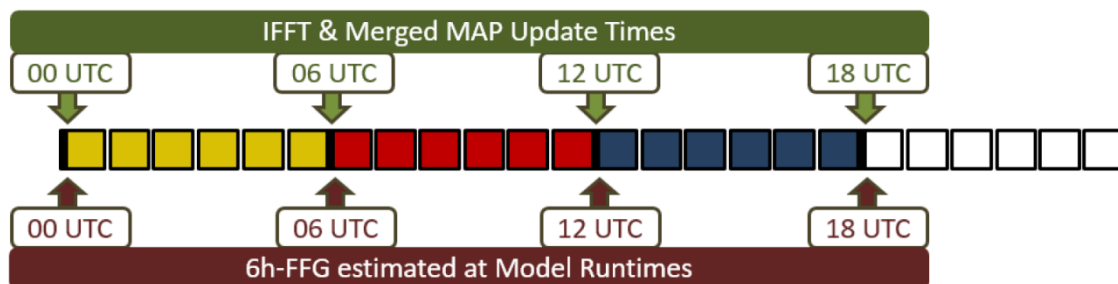
The 03-hr FFFT at 00:00 UTC = the difference between the 03-hr Forecasted MAP from 00:00 UTC and the 03-hr FFG from 00:00 UTC, valid at 03:00 UTC. The 03-hr FFFT at 06:00 UTC = the difference between the 03-hr Forecasted MAP from 06:00 UTC and the 03-hr FFG from 06:00 UTC, valid at 09:00 UTC. The 03-hr FFFT at 12:00 UTC = the difference between the 03-hr Forecasted MAP from 12:00 UTC and the 03-hr FFG from 12:00 UTC, valid at 15:00 UTC. The 03-hr FFFT at 18:00 UTC = the difference between the 03-hr Forecasted MAP from 18:00 UTC and the 03-hr FFG from 18:00 UTC, valid at 21:00 UTC.

Figure below is showing 03-h FFFT on 14 September 2018 at 18 UTC for the north part of Philippines.



### 1.3. 6-Hour Forecast Flash Flood Threat (6 hr-FFFT)

As it is shown in figure below, 6-Hour FFFT is estimated and updated at 00 UTC, 06 UTC, 12 UTC and 18 UTC. FFFT 06-hr: Difference of 06-hr FMAP for current model processing hour and current 06-hr FFG (mm/6hr).

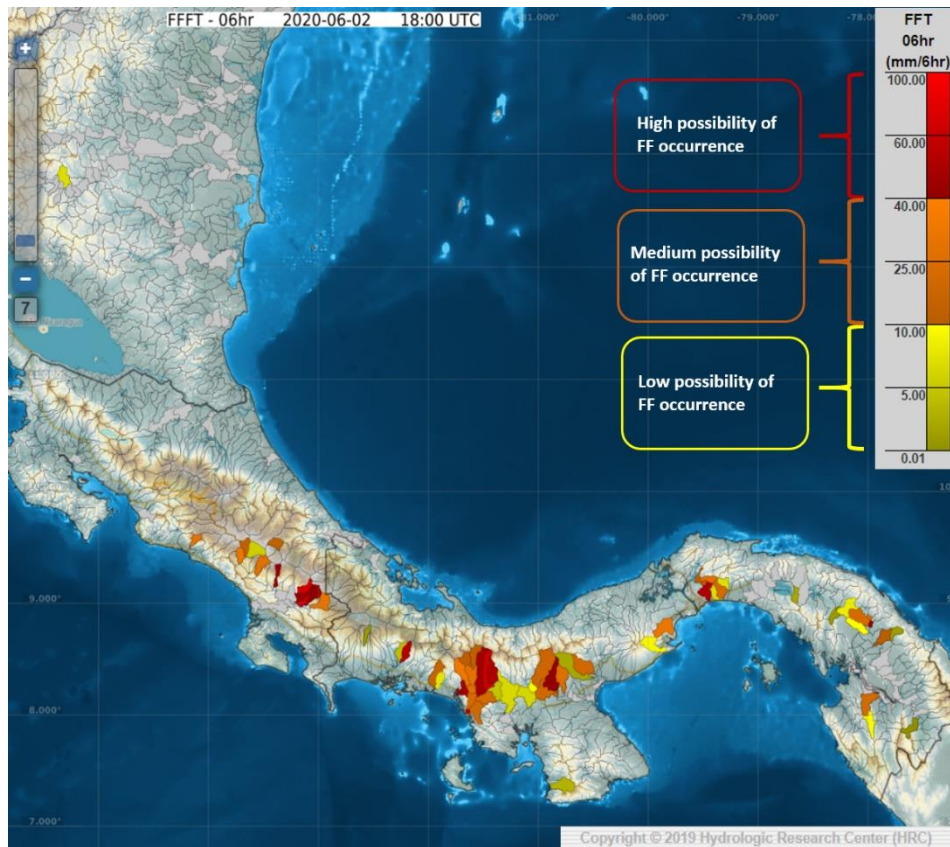


6-hr FFFT estimation scheme

$$6h \text{ FFFT}_t = 6h \text{ FMAP}_t - 6h \text{ FFG}_t, \text{ where } t = 00, 06, 12 \text{ and } 18 \text{ UTC}$$

The 06-hr FFFT at 00:00 UTC = the difference between the 06-hr Forecasted MAP from 00:00 UTC and the 06-hr FFG from 00:00 UTC, valid at 06:00 UTC. The 06-hr FFFT at 06:00 UTC = the difference between the 06-hr Forecasted MAP from 06:00 UTC and the 06-hr FFG from 06:00 UTC, valid at 12:00 UTC. The 06-hr FFFT at 12:00 UTC = the difference between the 06-hr Forecasted MAP from 12:00 UTC and the 06-hr FFG from 12:00 UTC, valid at 18:00 UTC. The 06-hr FFFT at 18:00 UTC = the difference between the 06-hr Forecasted MAP from 18:00 UTC and the 06-hr FFG from 18:00 UTC, valid at 00:00 UTC.

In example below 06-h FFFT for Panama and Costa Rica is shown low, medium and high values of FFFT.



06-hr FFFT at 18 UTC, 2 June 2020

This document was prepared by WMO-FFGS team using South East Europe Flash Flood Guidance System Forecaster Guide<sup>1</sup> and FFGS Operational Output Product Descriptions available in the FFGS Real-Time Product Console developed by Hydrologic Research Center.

<sup>1</sup> [https://www.wmo.int/pages/prog/hwrf/flood/ffgs/documents/SEEFFGS\\_Forecaster\\_Guide-Final\\_ES\\_TM-AS-PM.pdf](https://www.wmo.int/pages/prog/hwrf/flood/ffgs/documents/SEEFFGS_Forecaster_Guide-Final_ES_TM-AS-PM.pdf)