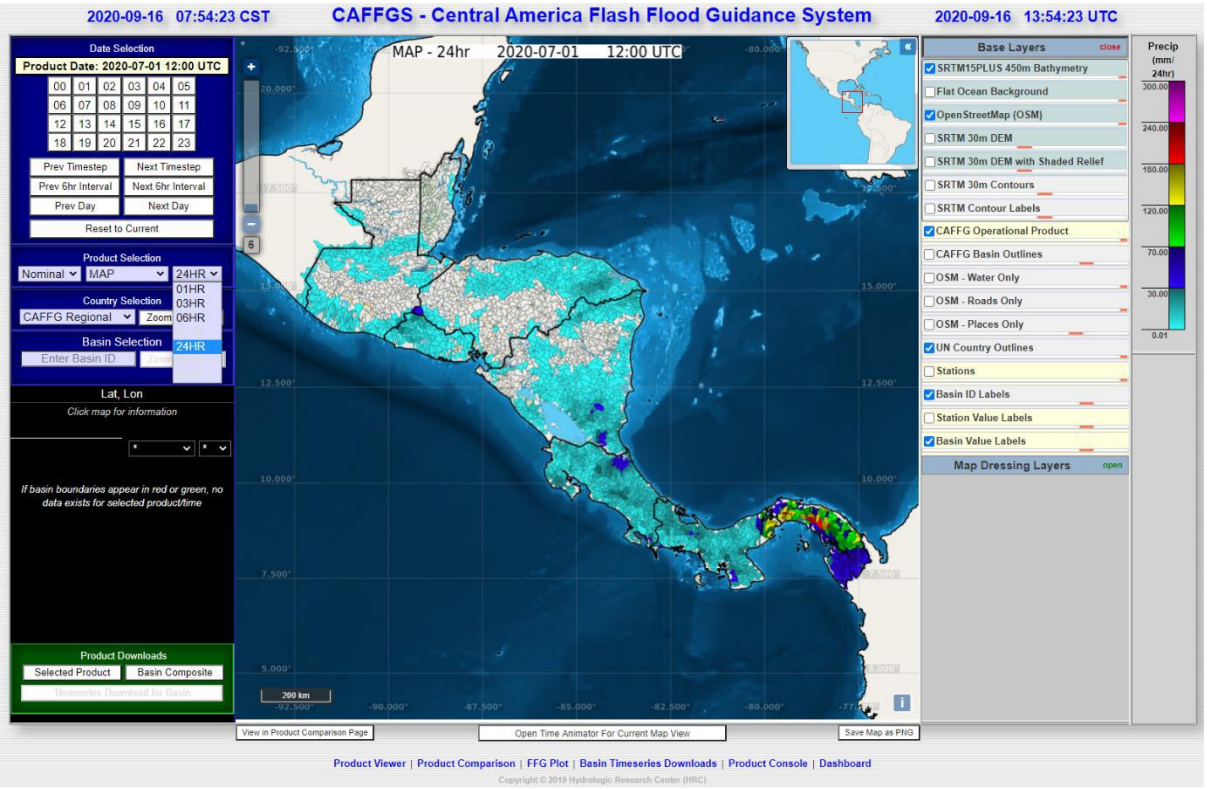
Merged Mean Areal Precipitation (Map)

Due to the complexity of the problem, the design of on-site networks has received considerable attention, both in the operational hydrologic environment (WMO 1994) and in the hydrologic research environment (Bras 1990). Hydrologists have developed several methods for estimating merged mean areal precipitation (MAP) over watersheds from rain gauge data. In most cases, the MAP estimation is based on a weighted average method, and because of the lack of ‘‘ground truth’’ data in most cases, the reliable estimation of precipitation estimate errors is an important issue studied using synthetic data generation (Tsintikidis et al., 2002).

Merged MAP in FFGS provides bias-corrected, best estimates of 1-, 3-, 6- and 24-hour precipitation accumulations over each of FFGS basins. This product is derived by selecting the best-available 1-hour precipitation input product for each basin from the bias-adjusted Radar precipitation estimates, MWGHE or bias-adjusted GHE or the gauge-interpolations, with preference for selection in that order.

The Merged MAP data products are updated every hour and reflect accumulations of basin-average precipitation of a given duration ending on the current navigation hour. Figure below shows the 24-hour accumulated MAP product for the Central America valid from 30 June 2020 at 12 UTC until 1 July 2020 at 12 UTC.



Example of Central America FFGS 24-hr Merged Mean Areal Precipitation product

The Merged MAP 6-hour accumulation product is applied during model processing as the precipitation input to the Snow-17 Model, the Sacramento Soil Moisture Accounting Model and flash flood threat model.

For more information please read:

Bras, R.L., 1990: Hydrology, Addison-Wesley, Reading, Mass.

World Meteorological Organization 1994: Guide to hydrologic practices (WMO-No. 168)., Geneva.

Tsintikidis, D., K.P. Georgakakos, J.A. Sperfslage, D.E. Smith, M.T. Carpenter, 2002: Precipitation Uncertainty and Raingauge Network Design within Folsom Lake Watershed. Journal of Hydraulic Engineering 7(2), 175-184

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

[1] https://www.wmo.int/pages/prog/hwrp/flood/ffgs/documents/SEEFFGS_Forecaster_Guide-Final_ES_TM-AS-PM.pdf