

NOAA/National Weather Service
National Hurricane Center / Tropical Analysis and Forecast Branch
Experimental Satellite Rainfall Quantitative Precipitation Estimates (QPE)
Product Description Document

15 September 2011

Part I. Mission Connection

- a. Product Description** - The National Hurricane Center's Tropical Analysis and Forecast Branch (TAFB) is providing on **an experimental basis** event-driven Satellite Rainfall Quantitative Precipitation Estimates (QPE) and model-derived Quantitative Precipitation Forecasts (QPF) for tropical cyclones and tropical disturbances affecting areas within the National Hurricane Center and Central Pacific Hurricane Center areas of responsibility (AOR). The experimental product represents an improvement over the existing satellite precipitation estimate product which is based on the Griffith-Woodley technique developed in the 1970s. The experimental product provides more robust satellite-based precipitation estimates from the Naval Research Laboratory (NRL) Blended and the Climate Prediction Center (CPC) QMORPH techniques and a time-matched forecast from the Global Forecast System (GFS) in tabular text and storm centered graphical formats. In addition, the experimental product provides a graphical 24 hour QPF from the Princeton Geophysical Fluid Dynamics (GFDL), the NOAA Hurricane Weather Research and Forecast (HWRF), and the GFS.
- b. Purpose** – The experimental QPE and QPF page is intended to provide, on an event-driven basis, a text and graphical depiction of satellite rainfall QPE and graphical depiction of model based QPF for tropical cyclones and pre-tropical cyclone disturbances. The product is primarily intended to provide forecast centers in the Caribbean, Mexico, and Central America better satellite based estimates and forecast guidance for significant rainfall events. In addition, decision support service (DSS) entities would have access to targeted QPF guidance that may be of assistance for distributing and directing resources to areas impacted by heavy rainfall.
- c. Audience** – The target audience for this product primarily includes the forecast centers in the Caribbean, Mexico, Central America, and the Eastern and Central North Pacific. However, other potential users of the product include emergency managers and other decision support agencies as well as first responders to events both on land and at sea such as search and rescue and oil spill relief efforts. The centralized location of the Satellite QPE and QPF product on the National Hurricane Center's web page gives these products increased visibility makes it easy for these partners to view the product for specific storms.
- d. Presentation Format** – The product page is currently automatically generated when model guidance is initiated on a tropical disturbance or cyclone in the Atlantic, Eastern North Pacific or Central North Pacific basins. The product page consists of satellite-based precipitation estimates from the NRL Blended and QMORPH techniques and a previous

forecast from the Global Forecast System (GFS) in a text table text with accompanying graphics that are centered over the storm. In addition the experimental product provides a graphical 24 hour QPF from the Princeton Geophysical Fluid Dynamics (GFDL) and NOAA Hurricane Weather Research and Forecast (HWRF) models as well as the GFS.

The URL for the experimental page is noted below

Experimental Satellite QPE and QPF for a tropical cyclone:

<http://www.nhc.noaa.gov/experimental/rainfall>

e. Feedback Method - Feedback and Comments

The Tropical Analysis and Forecast Branch of the National Hurricane Center is requesting your comments and feedback about the experimental satellite QPE and QPF page. Please feel free to use the link below for submitting comments:

via E-mail: nhcwebmaster@noaa.gov

via electronic survey : <http://www.weather.gov/survey/nws-survey.php?code=srqpf>

Additionally comments may also be provided to:

National Hurricane Center/Tropical Analysis and Forecast Branch

11691 SW 17th St

Miami, FL 33165-2149

(305) 229-4454 or (305) 229-4476

Hugh.Cobb@noaa.gov or Jessica.Schauer@noaa.gov

Experimental Feedback Period: September 15, 2011 through November 30, 2012.

Part II. Technical Description

- a. Format and Science Basis** – The Satellite QPE represents an improvement over the Griffith-Woodley technique by incorporating precipitation estimates from NRL blended product and QMORPH techniques as well as a time-matched recent forecast from the GFS model. These estimates are provided in text and graphical formats. The page also provides a QPF forecast component out to 24 hours from the GFDL and HWRF hurricane models and from the GFS model.
- b. Product Availability** - The experimental satellite based QPE and model based QPF products are available four times a day when there are active tropical cyclones and pre-tropical cyclone disturbance areas and are posted to the web at approximately 0400, 1000 1600 and 2200 UTC.

- c. **Additional Information** - The following pages provide a sample of the proposed main web page for active tropical cyclones and a tabular text satellite QPE for tropical storm Katia generated 1200 UTC 31 August 2011.

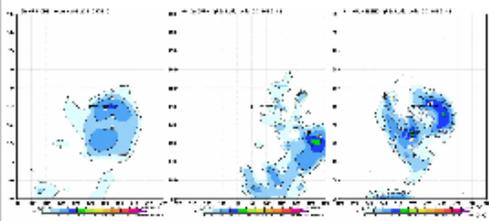
Experimental Tropical Rainfall Products

[Rainfall Graphics](#) | [Description](#) | [Rainfall Tools](#)

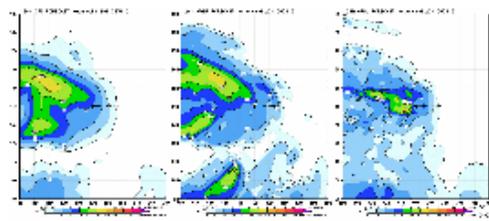
Current Operational Text Products
[Eastern Caribbean](#) | [Central Caribbean](#) | [Western Caribbean](#)

TROPICAL STORM KATIA - [Experimental Text Product](#)

6-hr Satellite Rainfall Estimates

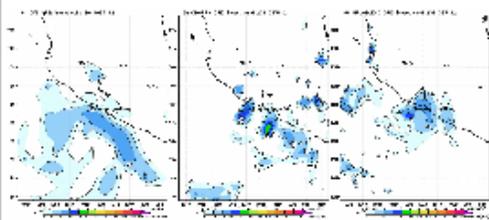


Model 24-hr Rainfall Forecasts

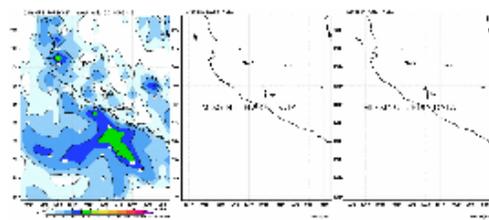


DISTURBANCE NEAR 103W - [Experimental Text Product](#)

6-hr Satellite Rainfall Estimates

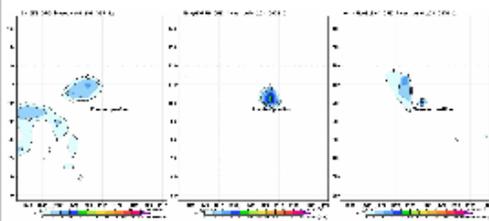


Model 24-hr Rainfall Forecasts

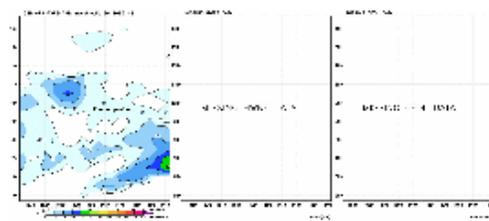


DISTURBANCE NEAR 149W - [Experimental Text Product](#)

6-hr Satellite Rainfall Estimates



Model 24-hr Rainfall Forecasts



About These Products

- [NHC Tropical Rainfall Graphics](#)
- [NHC Tropical Rainfall Text Products](#)
- [NRL-Blend Satellite Rainfall Estimates from the Naval Research Laboratory](#)
- [QMORPH Satellite Rainfall Estimates from the Climate Prediction Center](#)

Figure 1. Sample Web Page depicting active tropical cyclones and pre-tropical cyclone disturbances.

SATELLITE TROPICAL DISTURBANCE RAINFALL ESTIMATES
 NWS NATIONAL HURRICANE CENTER MIAMI FL
 1605 UTC WED AUG 31 2011

SYSTEM NAME	DATE/TIME	LOCATION
TROPICAL STORM KATIA	31/1200 UTC	14N 40W

RAINFALL ESTIMATED BY SATELLITE VIA QMORPH...
 24-HR RAINFALL MAXIMUM FROM 12-12 UTC- 30MM AT 12N 38W
 6-HR RAINFALL MAXIMUM FROM 06-12 UTC- 30MM AT 12N 38W
 RAINFALL DISTRIBUTION IN MM OVER THE LAST 6 HOURS FROM 06-12 UTC...

LATITUDE	LONGITUDE						
	43W- 42W	42W- 41W	41W- 40W	40W- 39W	39W- 38W	38W- 37W	
16N-17N	0- 0	0- 0	0- 0	0- 0	0- 0	0- 0	0- 0
15N-16N	0- 0	0- 0	0- 0	0- 0	0- 10	0- 10	0- 10
14N-15N	0- 0	0- 0	0- 0	0- 0	0- 10	0- 10	0- 10
13N-14N	0- 0	0- 0	0- 0	0- 10	0- 20	0- 20	0- 20
12N-13N	0- 0	0- 0	0- 0	0- 10	0- 20	0- 20	0- 20
11N-12N	0- 0	0- 0	0- 0	0- 10	0- 10	0- 30	

RAINFALL ESTIMATED BY SATELLITE VIA NRL-BLEND...
 24-HR RAINFALL MAXIMUM FROM 12-12 UTC- 110MM AT 12N 40W
 6-HR RAINFALL MAXIMUM FROM 06-12 UTC- 110MM AT 12N 40W
 RAINFALL DISTRIBUTION IN MM OVER THE LAST 6 HOURS FROM 06-12 UTC...

LATITUDE	LONGITUDE						
	43W- 42W	42W- 41W	41W- 40W	40W- 39W	39W- 38W	38W- 37W	
16N-17N	0- 0	0- 0	0- 0	0- 0	0- 0	0- 0	0- 0
15N-16N	0- 0	0- 10	0- 10	0- 10	0- 0	0- 0	0- 0
14N-15N	0- 10	0- 40	0- 10	0- 60	0- 70	0- 50	0- 50
13N-14N	0- 20	0- 40	0- 40	0- 40	10- 80	0- 80	0- 80
12N-13N	0- 10	0- 40	20-110	10-110	0- 60	0- 50	0- 50
11N-12N	0- 0	0- 20	0- 40	0- 20	0- 20	0- 10	0- 10

RAINFALL ESTIMATED FROM 12 UTC 30 AUG GFS MODEL RUN...
 24-HR RAINFALL MAXIMUM FROM 12-12 UTC- 70MM AT 13N 37W
 6-HR RAINFALL MAXIMUM FROM 06-12 UTC- 60MM AT 14N 39W
 RAINFALL DISTRIBUTION IN MM OVER THE LAST 6 HOURS FROM 06-12 UTC...

LATITUDE	LONGITUDE						
	43W- 42W	42W- 41W	41W- 40W	40W- 39W	39W- 38W	38W- 37W	
16N-17N	0- 0	0- 0	0- 0	0- 0	0- 10	0- 0	0- 0
15N-16N	0- 0	0- 0	0- 0	0- 0	0- 10	0- 10	0- 10
14N-15N	0- 0	0- 10	0- 10	0- 60	0- 60	0- 50	0- 50
13N-14N	0- 0	0- 10	0- 20	10- 60	20- 60	10- 50	10- 50
12N-13N	0- 10	0- 10	0- 30	20- 50	20- 50	10- 20	10- 20
11N-12N	0- 10	0- 10	0- 30	0- 50	0- 50	0- 20	0- 20

DIFFERENCES BETWEEN THE SATELLITE AND MODEL-DERIVED RAINFALL ESTIMATES INDICATE UNCERTAINTY IN THE AMOUNT OF RAIN RECEIVED

RAINFALL MAY BE UNDERESTIMATED ON THE WINDWARD SIDE OF TERRAIN

PLEASE SEE THE LATEST TROPICAL CYCLONE PUBLIC ADVISORY FOR THE OFFICIAL RAINFALL FORECAST FOR TROPICAL CYCLONES

FOR ADDITIONAL INFORMATION PLEASE VISIT
[HTTP://WWW.HURRICANES.GOV/RAINFALL](http://www.hurricanes.gov/rainfall)

Figure 2. Sample tabular text QPE for tropical storm Katia generated 1200 UTC 31 August 2011.