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

**30 January 2013**

## 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**

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: May 15, 2013 through November 30, 2013.

## 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.

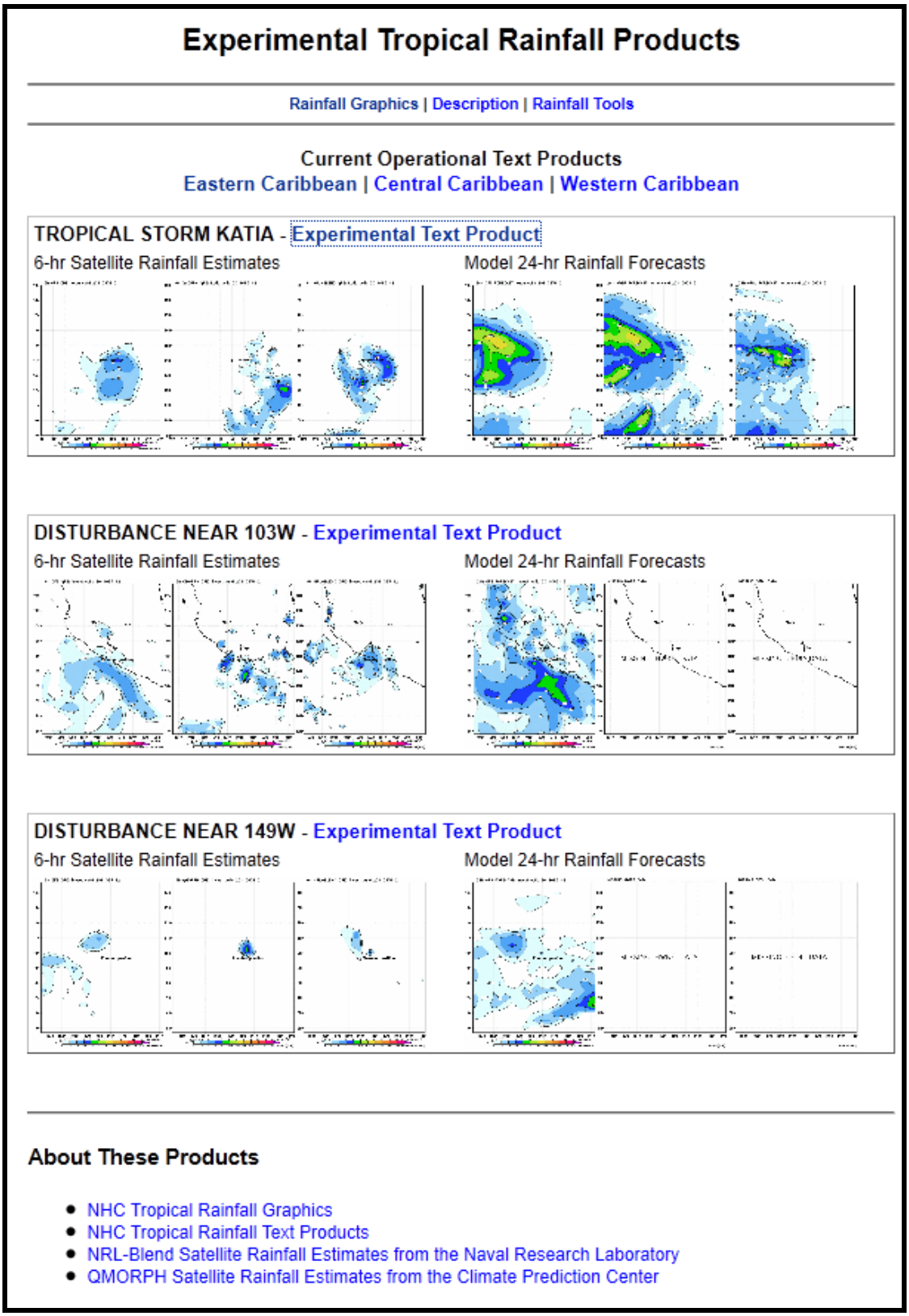


**Figure 1.** Sample Web Page depicting active tropical cyclones and pre-tropical cyclone disturbances.

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

SYSTEM NAME                      DATE/TIME          LOCATION
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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
15N-16N   0-  0     0-  0     0-  0     0-  0     0- 10     0- 10
14N-15N   0-  0     0-  0     0-  0     0-  0     0- 10     0- 10
13N-14N   0-  0     0-  0     0-  0     0- 10     0- 20     0- 20
12N-13N   0-  0     0-  0     0-  0     0- 10     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
15N-16N   0-  0     0- 10     0- 10     0- 10     0-  0     0-  0
14N-15N   0- 10     0- 40     0- 10     0- 60     0- 70     0- 50
13N-14N   0- 20     0- 40     0- 40     0- 40    10- 80     0- 80
12N-13N   0- 10     0- 40    20-110    10-110     0- 60     0- 50
11N-12N   0-  0     0- 20     0- 40     0- 20     0- 20     0- 10
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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
15N-16N   0-  0     0-  0     0-  0     0-  0     0- 10     0- 10
14N-15N   0-  0     0- 10     0- 10     0- 60     0- 60     0- 50
13N-14N   0-  0     0- 10     0- 20    10- 60    20- 60    10- 50
12N-13N   0- 10     0- 10     0- 30    20- 50    20- 50    10- 20
11N-12N   0- 10     0- 10     0- 30     0- 50     0- 50     0- 20
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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
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**Figure 2.** Sample tabular text QPE for tropical storm Katia generated 1200 UTC 31 August 2011.