

# South America Flash Flood Guidance System

**Flash Flood Issues: Forecasting & Warnings – Use  
in Disaster Management**



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# Background

Ninety percent (90%) of Guyana's population resides along the (Atlantic) Coast, which is below mean sea level and accounts for 10% of the country's land space.

The population centers along the coast is locked between the Atlantic Ocean (north) and a series of storage reservoirs (conservancies) to the south.

Flood waters are drained via a complex drainage system either by pumping, or at low tide; when the sea level is low enough to allow for gravity-based release through a number of sluices.

Guyana, has two rainfall seasons, both triggered by the north-south movement of the ITCZ:

- primary rainfall season April to July
- secondary season November - February

# Nature & Impacts of Flash Floods

- Flooding is the main natural hazard in Guyana.
- In January 2005, Guyana experienced its most devastating flood event. Thirty-four (34) lives were lost (7 were caused by drowning and the remainder were attributed to illness arising from the flood), properties were damaged and crops and livestock were affected. *However this was NOT a flash flood event.*
- ***Flash floods occur primarily as a result of severe thunderstorms and other related weather conditions. These flood events are primarily pluvial in nature.***
- The most recent flash flood event occurred in July, 2016. However, in November 2013, there was a flash flood which took less than 6 hrs to inundate parts of Georgetown, the capital city. No lives were lost, however there was significant damages to properties and economic losses.



# Nature & Impacts of Flash Floods

- In Guyana, flooding generally causes damage to property and infrastructure, and agricultural losses.
- Flooding also increases the risk of waterborne diseases with little loss of human life. However, the worst recorded flood event in Guyana in January, 2005 resulted in several deaths due to Leptospirosis January, 2005
- Lost of livestock due to drowning
- Water is often contaminated during flooding making it difficult to get potable water
- The agricultural sector is most affected since there is damages to crops and loss of livestock. This has a direct impact on the country's economy which is Agri-based.
- The issue of Flash Floods is exacerbated along coastal Guyana due to a poorly maintained drainage system and the indiscriminate disposal of solid waste into the drainage system.

# Weather Forecasting Tools

Forecasting and early warning tools used:

- Doppler Weather Radar
- WRF/Numerical Model
- Satellite Data
- GFS model Guidance/SmartMet

The NHMS is the sole authority for dissemination of forecasts /advisories/warnings and this is primarily distributed via:

- e-mail
- Website
- Radio
- Television
- Weather Bulletins/Advisories



# Flood Forecasting in Guyana

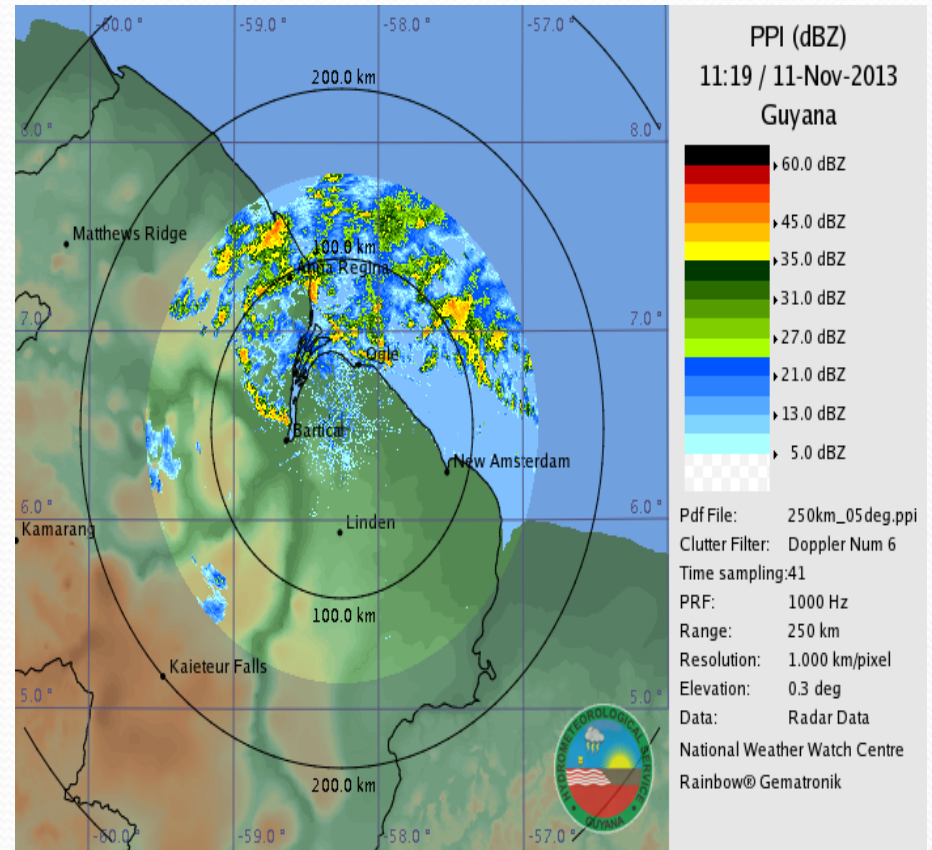
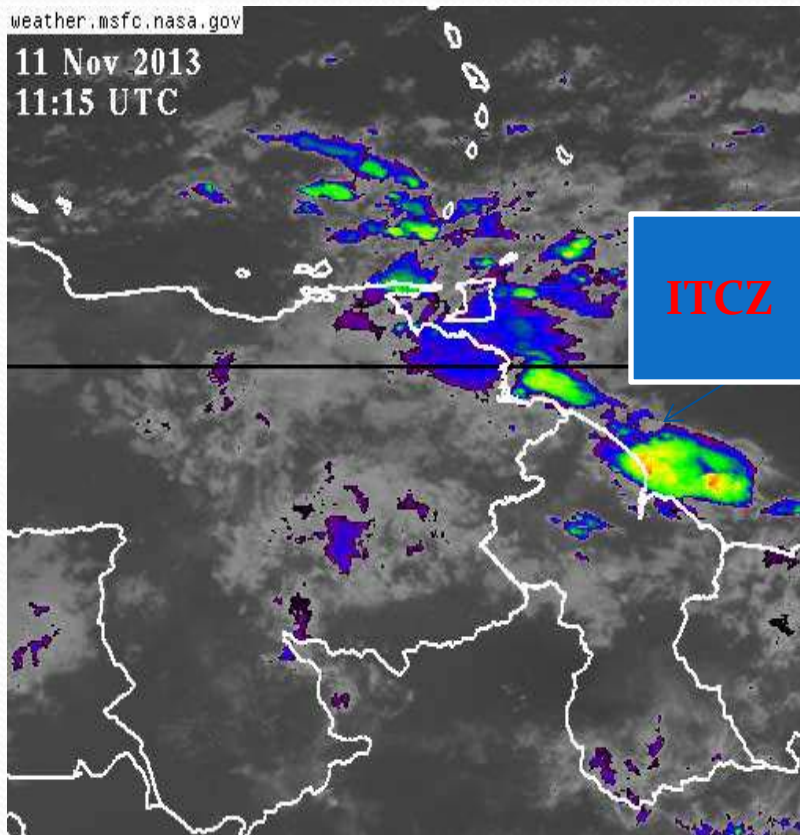
- Currently there is no flood forecasting model used by the Hydrometeorological Service for flood forecasting
- Flood waters are primarily removed by a complex man made drainage system, the design capacity of this system is known. That is, it is designed to remove 2 inches/50mm of rainfall in 24 hours.
- If the weather forecast indicates rainfall amounts in excess of 50 mm in 24 hour, then a flood advisory is issued for Coastal Guyana. This method has worked to some degree, however, it is very broad based and does not address flash floods at the basin level.
- However, in the recent past there has been an increase in reports of flash flooding; the lack of information on the hydrology of many coastal river basins has made the existing methodology insufficient.
- There is therefore a need to improve flood forecasting capabilities in Guyana.

# Relationship with DMA

- The local Disaster Management Agency is the Civil Defence Commission (CDC)
- The NHMS is a member of the National Disaster Risk Reduction Platform (NDRRP) chaired by the National Disaster Coordinator (Minister of State) and hosted by the CDC
- The NMHS chairs the National Early Warning Sub-committee which is a sub-committee of the NDRRP
- Before or during a major event, the National Emergency Operation Centre (NEOC) is activated at the CDC. The NMHS is also present at the NEOC.
- There is exist a good working relationship between the DMA and the NMHS.



# Examples of forecasting tools





# Flooding in Guyana



# Flooding in Guyana





# Coastal Flooding

