Haiti Dominican Republic Flash Flood Guidance System HDRFFG

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HDRFFG Steering Committee #2
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Hydrologic Research Center

- HRC is a prototype Non-profit, public-benefit research and training corporation in the USA, 501(c)(3), established in 1993 in San Diego, California.

- Staff of professional scientists and engineers, university professors, post-doctoral associates, graduates, and visiting scholars.

- Currently 10 employees
  - Hydrologists
  - Meteorologists
  - Climate Scientists
  - Wave modeler
  - Computer specialists
  - Disaster Risk Reduction Specialist

Objective: to Advance the science and engineering in Hydrology, Hydrometeorology, and Hydroclimatology through Research, Science Cooperation, Technology Transfer and Training.
Flood - occurrence of a flow event that overtops the natural or artificial banks in a reach of river channel.

Flash Flood – a flood that follows shortly after rainfall event.

Bankfull Flow - a flow in which the water level is at the top of its banks and further rise would result in inundation of the flood plain.

Flash Flood Guidance (FFG) – the volume of spatially uniform precipitation of a given duration (1-6 hours) over a certain small catchment that is required to cause minor flooding in the draining outlet of the catchment.

Threshold Runoff – rainfall depth in a given duration that is needed for the flow at the basin outlet to exceed bankfull flow when the basin is in near saturation conditions.

Flash Flood Threat – rainfall of a given duration in excess of the corresponding Flash Flood Guidance value.
Haiti Flash Flood Guidance System

**DATA**
- Precipitation: NESDIS Geostationary Satellite Hydroestimator (Hourly totals; 4x4 km²)
  - Haiti and DR hourly raingauge data
  - NCEP High Res Mesoscale Model Forecast (0-48hrs)
- Reference ET: Climatological estimates using historical temperature
- Digital elevation data (90m)
- Digital soils and land-use/land-cover data (FAO and DR)

**MODELS**
- Satellite Rainfall Bias Adjustment
- Adaptation of NWS Soil Water Accounting Model
- Geomorphologic Unit Hydrograph Model
- Modern Flash Flood Guidance Estimation Theory

**PRODUCTS (catchment based – median area=72 km² [25-2000]; hourly updates)**
- Mean Areal Precipitation Totals (1, 3, 6 hr duration)
- Soil Water Estimates over Two Soil Zones
- Flash Flood Guidance/Flash Flood Threat Volumes (1, 3, 6 hr duration)
Volume of rainfall of a given duration over a small catchment that is just enough to cause bankfull flow at the outlet of the draining stream.
System is Operational - Running at HRC

Forecasters should be able to access the system
HDRFFG Project Implementation Status

• BASINS DELINEATION
• FEEDBACK ON DELINEATION BY COUNTRIES
• HISTORICAL DATA BY COUNTRIES
• PARAMETRIC DEVELOPMENT AND PRECIPITATION BIAS ADJUSTMENT USING HISTORICAL DATA
• INGEST REAL TIME LOCAL DATA BY COUNTRIES
• SYSTEM IMPLEMENTED AT HRC
• HANDS-ON TRAINING

• LOCAL INSTALLATION AND OPERATIONAL TRAINING
Data Requirements

**Real Time Data:**
- Real time rainfall data
- Gauge data from Haiti
- Potential ET maps

GIS Layers to be added to the map server

Numerical Weather Prediction
Numerical Weather Prediction

http://www.emc.ncep.noaa.gov/mmb/mpyle/haiti_prod/
secured site: Other forecasted variables may provide additional valuable information

- WRF models from NCEP
- Model output interpolated to a common 0.045 degrees grid
- Warm season precip. is difficult to forecast
Flash Flood Risk Assessment
Entire Haiti (Average Basin Area: 72 km²)
Hurricane Tomas
Affected Haiti November 5-6, 2010