CARIBBEAN INSTITUTE FOR METEOROLOGY & HYDROLOGY CARIWIN 2nd. SENIOR ADMINISTRATIVE WORKSHOP 19-20 January,2009. Flood Disasters in the Caribbean & the Role of Monitoring I Forecasting. Bγ Kailas Narayan Chief Hydrologist, CIMH.



Floods are primarily natural events. Human activity influences the frequency & severity of floods.



Flooding worldwide accounts for hundreds of thousands of fatalities.



Some Headlines



Death toll in Caribbean floods soars past 1,400

Tropical storm Noel has wreaked havoc on several Caribbean islands killing as many as 59 people and causing countless others to evacuate.

Caribbean floods' dead, missing top 3,300

Ivan swirls through Caribbean At least 11 dead after hurricane passes Jamaica

What is a flood?

- An overflow of water from a river. - Water circulates in the hydrological cycle from clouds to soil to streams to oceans & back to clouds.... When this system backs up there is a flood. - A flood is an imbalance.

Overflow of streams onto the flood plains due to run-off from rainfall, where run-off is the excess water from rainfall after infiltration. Two basic types of floods: 1. A regular river flood, water gradually climbs over the edges of a river.



2. Flash Floods – occur when a wall of water quickly sweeps over an area.

Causes of floods? Over-saturated soil, when the ground cannot hold anymore water. heavy, intense rainfall. High river, stream or reservoir levels caused by unusually large amounts of rain.

Urbanization, or lots of buildings & parking lots.

Rainfall in the Caribbean. Systems which can produce significant rainfall:

 Inter-tropical Convergence Zone (ITCZ).
 Tropical Storms
 Tropical waves.
 Upper level troughs.
 Thunderstorm cells. Tropical Storms & Tropical Waves can be tracked through satellite imagery for days in advance. Warnings are possible days in advance. ITCZ – moves from $10^{\circ}N$ to $5^{\circ}S$. Seasonal movement well defined. Daily fluctuation more difficult to determine. Can be influenced by tropical waves & upper level troughs. Rainfall patterns from ITCZ, tropical waves & tropical storms can have wide variations in intensity, duration & areal extent.

Range from low to high intensity & long duration, greater than six hours.

Monitoring of floods. Nationally -Well-established systems in most of the larger territories. -Lacking in smaller islands.

Regionally. -Regional institutions – e.g. CIMJ. -Regional projects -CDBCIDAGCOS CADMCarib-Hycos

Methods of monitoring: 1. Manual 2. Recording 3. Loggers 4. Telemetric system 5. Doppler radar



Magnitude of a flood – classified in terms of its frequency – e.g. a 500-year flood is one that will occur, <u>on</u> <u>average over a long period of time</u>, once in 500 years.



Analysis of Floods.1. Hydraulic/hydrologic.2. Statistical.

Some of the products of analyses. 1. Propagation of a flood wave. 2. Probability of occurrence of a specified flood within a specified time period. <u>3. Flood plain maps – a base for flood</u> hazard maps.





Flood plain maps for Speightstown



Mitigation measures: 1. Structural. E.g. Dams, canals. 2. Non – structural. E.g. Zoning.

\$3B project moving apace... Private contractor to build Hope Canal The six-and-a-half miles long canal to be cut through Hope to ease pressure on the dam of the massive East Demerara Water Conservancy (EDWC) will be done by a private contractor, President Bharrat Jagdeo announced yesterday.



Even in danger, she still remembers to smile



Sometimes getting wet was unavoidable



Not only is it deep but you have to look out for crocodiles



Someone did not believe me when I mentioned that crocs were

around



Groundwater flood in Jamaica.



Overtopping of dam aback of Ogle



East Demerara Water Conservancy



East Demerara Water Conservancy



East Demerara Water Conservancy Canal



Overtopping of the EDWC dam



