CAFFG Project Overview

HYDROLOGIC RESEARCH CENTER

3-5 May 2017
First Design circa 2003/2004
CAFFG History Highlights

• First installation in Summer 2004
• First Operational Validation in Fall of 2004
• Upgraded hardware and software, added high and low precipitation sensitivity options in 2006
• Upgraded software, parametric reanalysis, added long-range probability of flash flood occurrence, and added WRF 2011
• Upgraded software, added microwave satellite observations, enhanced CAFFG with landslide capability in 2016
Recent CAFFG New Project Elements

- Microwave satellite data ingest ad bias adjustment with raingauge data
- Landslide assessment capability
- Updating User’s Guide
Microwave Satellite Data

Table 1: Central America Regions for Satellite Rainfall Bias Analysis
Region 01: Costa Rica West – coastal/low elevation
Region 10: Costa Rica West – high elevation (732 – 3630m)
Region 20: Nicaragua, Honduras, Costa Rica East – coastal/low elevation
Region 30: Honduras, Nicaragua – higher elevation (580 – 1500m)
Region 40: Nicaragua, Costa Rica East
Region 50: El Salvador
Region 60: Honduras, East – lower elevation
Region 70: Guatemala, El Salvador, Honduras – higher elevation (702 – 1854m)
Region 80: Panama Canal

Table 2: Bias Adjustment Factors by Range of Precipitation Rate for the MWGHE and for the Wet Season (identified as MJJAS) – Region 20

<table>
<thead>
<tr>
<th>LOW RATE, HIGH RATE, BIAS FACTOR</th>
<th></th>
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<tbody>
<tr>
<td>0.00, 0.11, 0.4262395</td>
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<tr>
<td>0.11, 0.23, 0.3921866</td>
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<td>0.23, 0.42, 0.4732263</td>
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<td>1.69, 2.75, 0.6990052</td>
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<tr>
<td>2.75, 4.30, 0.7033168</td>
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<tr>
<td>4.30, 7.57, 0.6856780</td>
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</tr>
<tr>
<td>7.57, &gt;7.57, 0.6532284</td>
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</tbody>
</table>

BIAS REDUCTION
1 May 2012 – 1 August 2016
FROM 0.92 MM/DAY
TO 0.007 MM/DAY
Multi-Spectral Satellite Rainfall for FFG Systems

Window of 3 days

CMORPH Latency

IRA(t-n-1) B(t-2) B(t-1)

IRA(t-n)
Evaluation from SARFFG

UM Adjusted HE

MWGHE

Low Level stratiform rain

2013/1 - 2014/3

CSI(>0)=0.12

CSI(>0)=0.18
CAFFG Landslide Capability

Susceptibility

Real Time

Database Template

AGU and Scientific American

An Early Warning System for Landslide Danger

Advances in satellite imaging, mapping, and rainfall estimations have made it possible to implement a regional real-time assessment of landslide hazard threats across Central America.
Central America Flash Flood Guidance System (CAFFG)
User’s Guide

Cristopher R. Spencer, Jason A. Sperkslage, and Konstantine P. Georgakakos

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