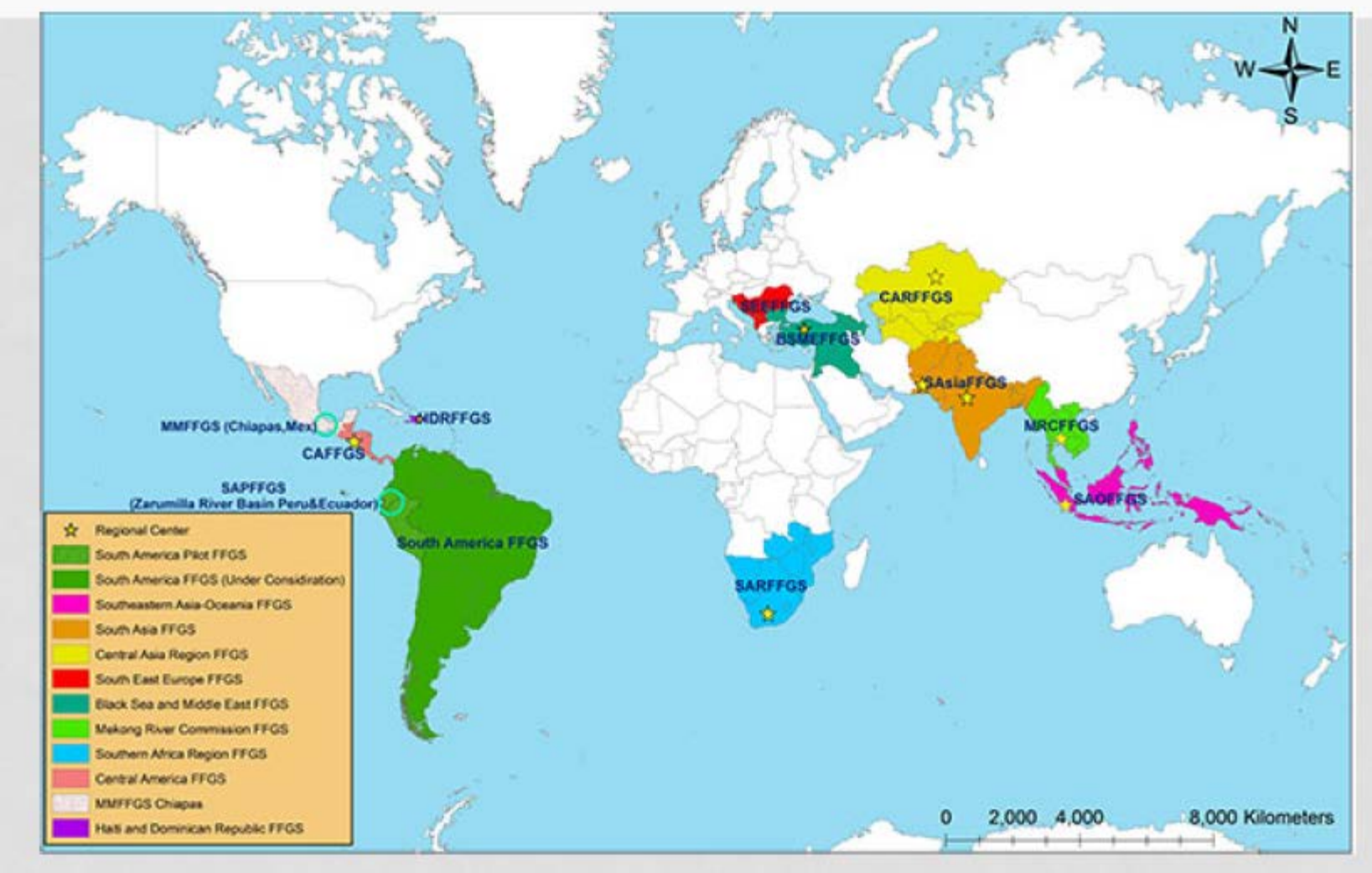
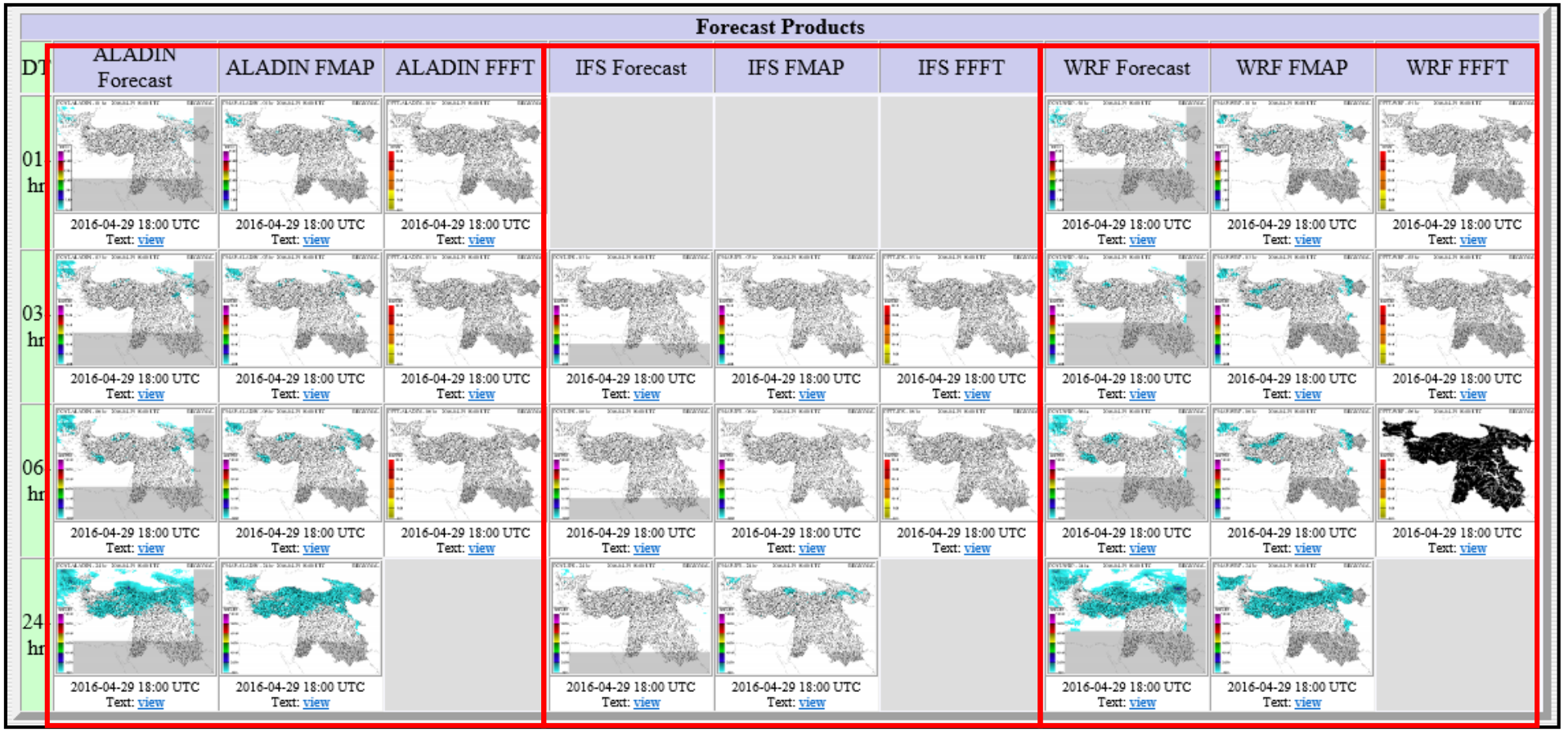
FFGS NEW AVAILABLE PRODUCTS



Future: Multi-model Forecast Precipitation

Currently under development, capability to ingest precipitation forecasts from multiple NWP models and generate FMAP and FFFT products (prototyped in BSMEFFGS).



Geostationary Operational Environmental Satellite - R Series (GOES-R) Launched in Nov 19, 2016

QPE:

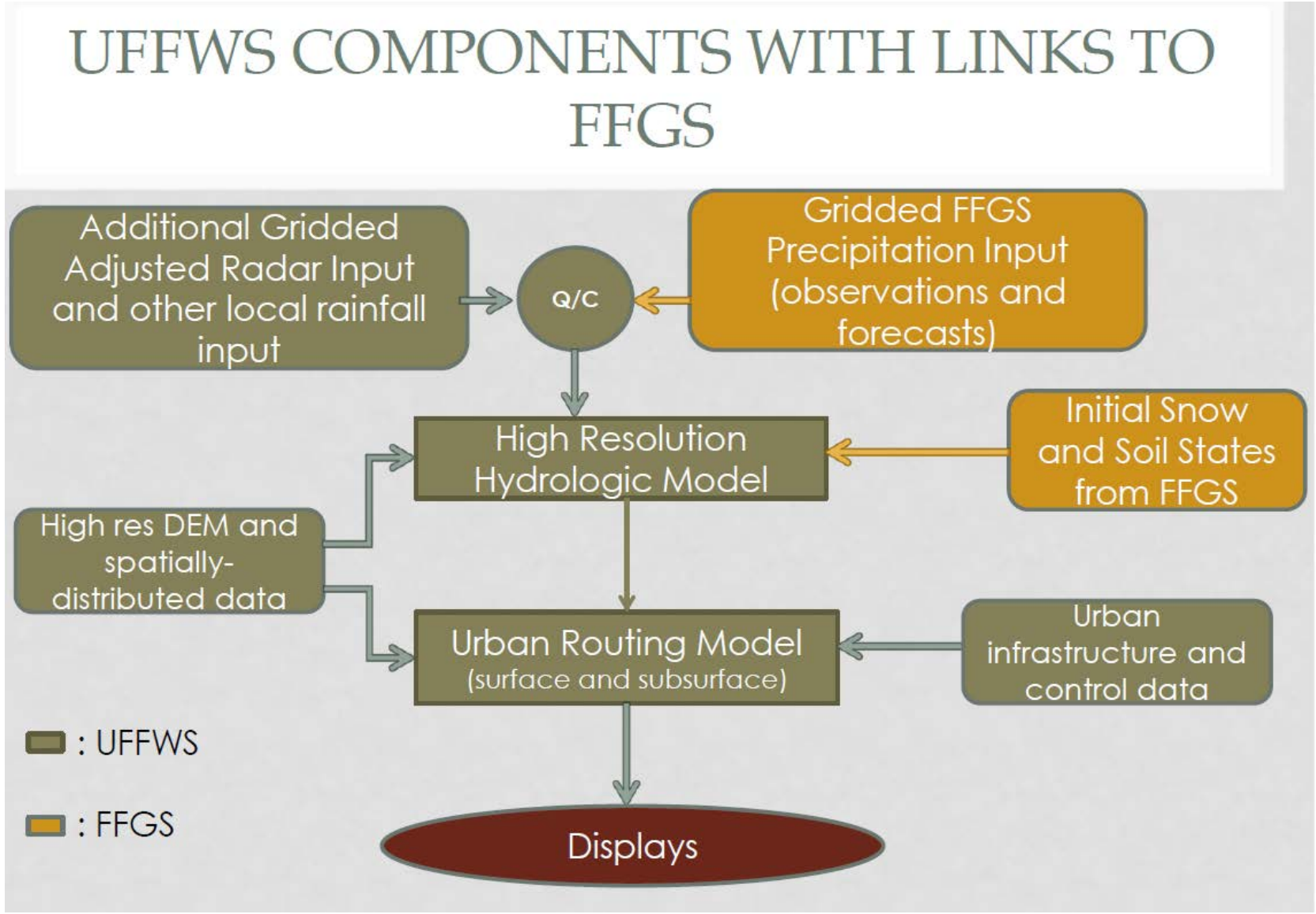
- 2km
- 4- time per hour
- Latency ~5min
- Using 5 IR bands
- Calibrated with MW

Channel Number	*Wavelength (μm)*	*Resolution (km)*	*Used in Rain Rate*
1	0.47	1.0	
2	0.64	0.5	
3	0.865	1.0	
4	1.378	2.0	
5	1.61	1.0	
6	2.25	2.0	
7	3.9	2.0	
8	6.19	2.0	✓
9	6.95	2.0	
10	7.34	2.0	✓
11	8.5	2.0	✓
12	9.61	2.0	
13	10.35	2.0	
14	11.2	2.0	✓
15	12.3	2.0	✓
16	13.3	2.0	

Table 2. Channel numbers, wavelengths, and footprint sizes of the ABI bands.

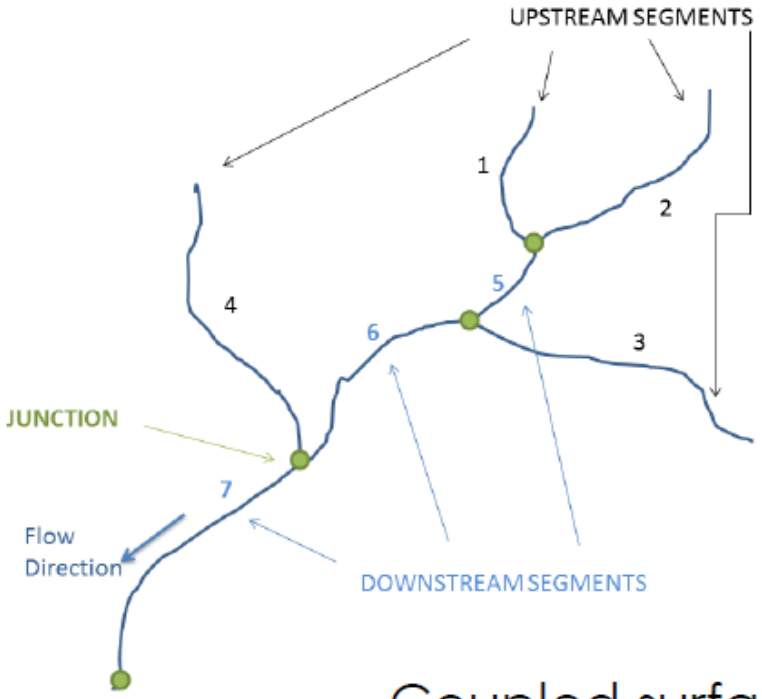
http://www.goes-r.gov/products/ATBDs/baseline/Hydro_RRQPE_v2.0_no_color.pdf

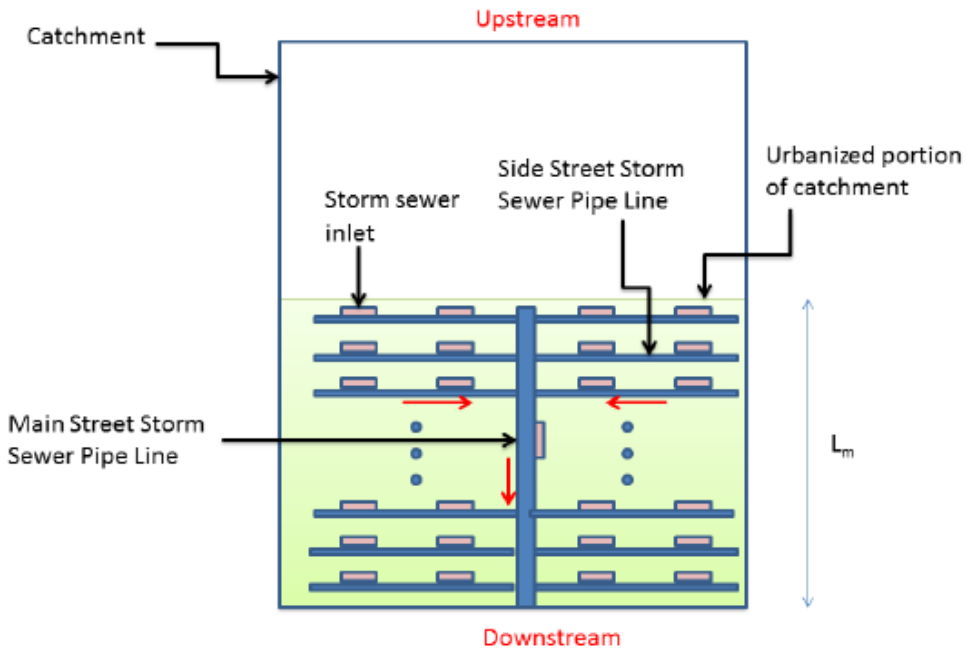
FFGS-Supported Urban Flash Flood Warning System [UFFWS]



HIGHER RESOLUTION FOR URBAN SECTOR

UFFWS BASIC TECHNICAL ELEMENTS

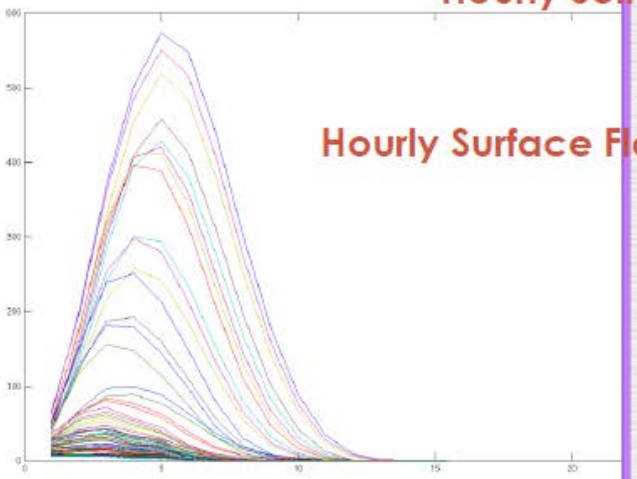




Coupled surface-subsurface routing of flows

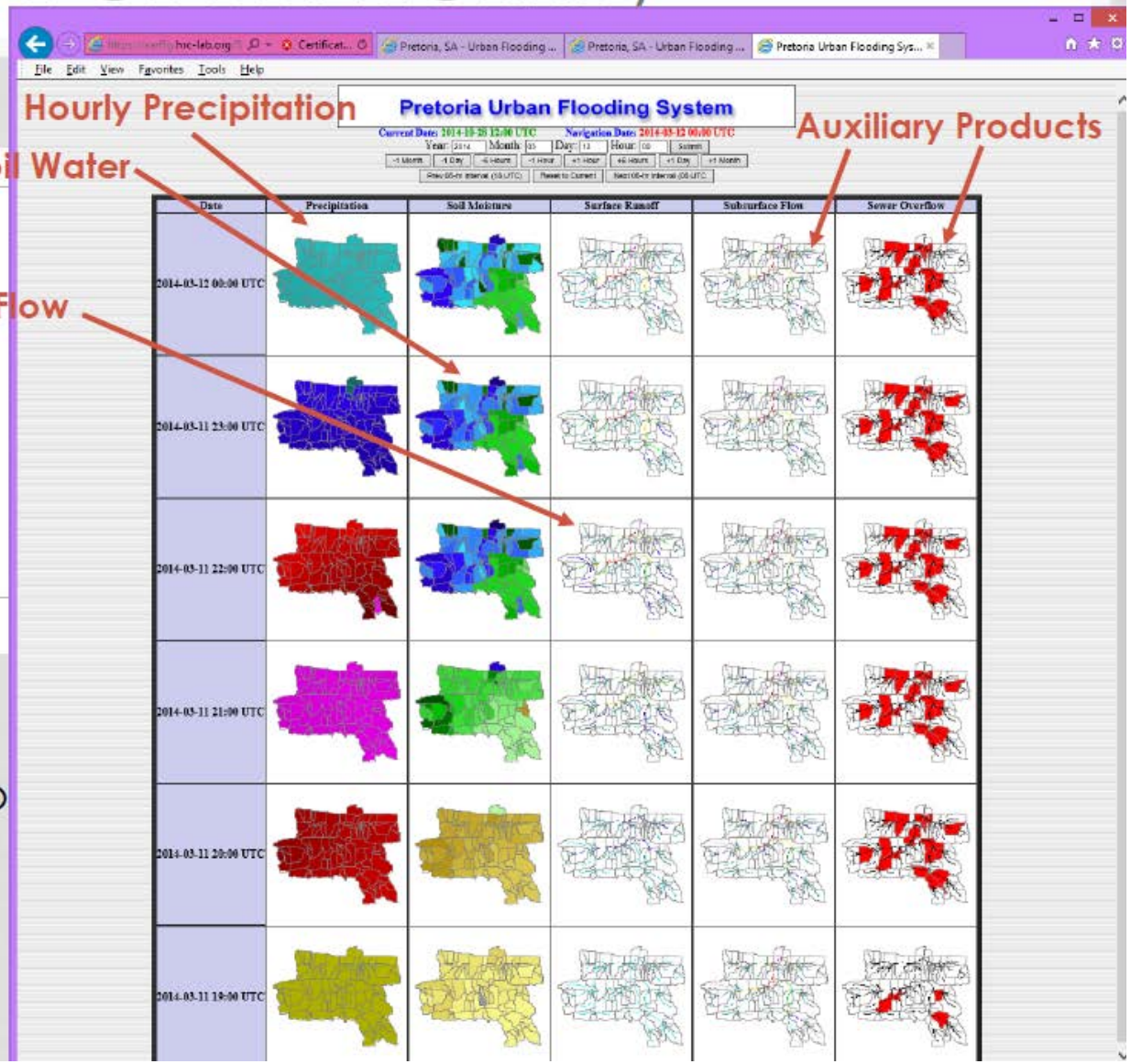
$$\partial y/\partial t + \partial(vy)/\partial x = 2q_L/B - f \qquad S_f = S_0 - \partial y/\partial x$$

DEMONSTRATION OF FEASIBILITY (CITY OF PRETORIA)



Hourly Soil Water

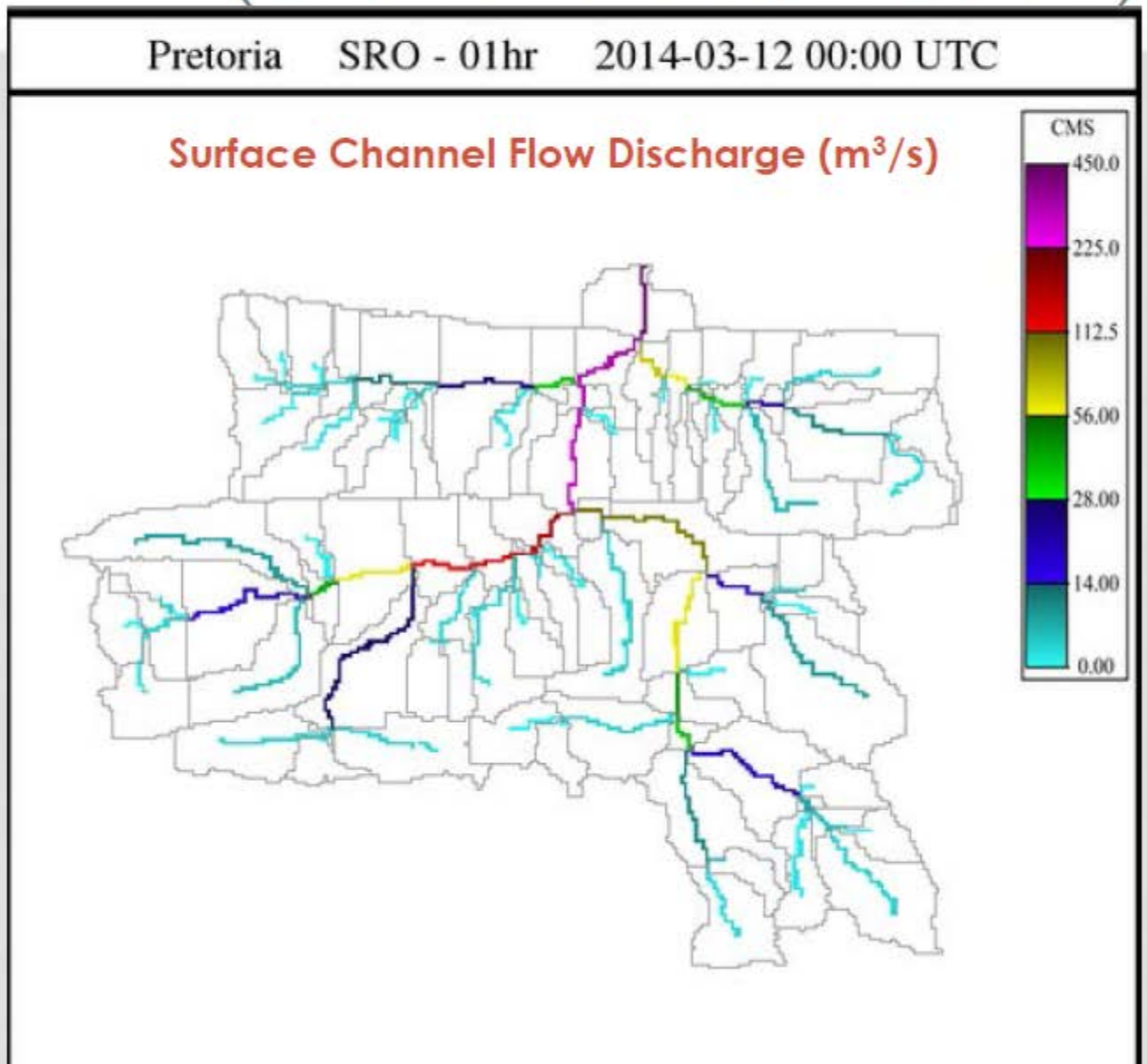
Hourly Surface Flow



Linux Implementation
Products through secure web

13 Oct 2016

DEMONSTRATION OF FEASIBILITY (CITY OF PRETORIA)



Colors based on exceedance of given alert thresholds for surface flows

Land Slides

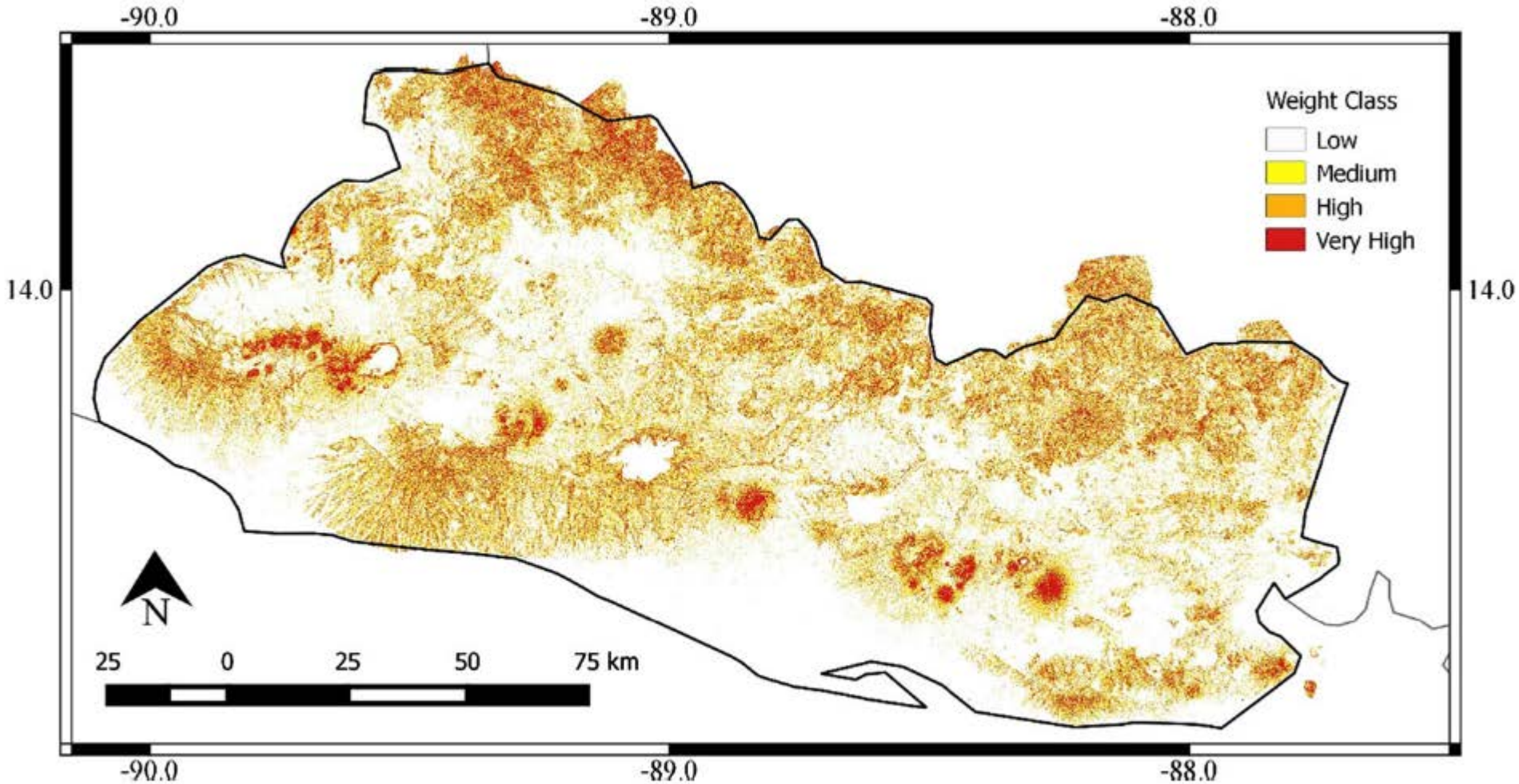
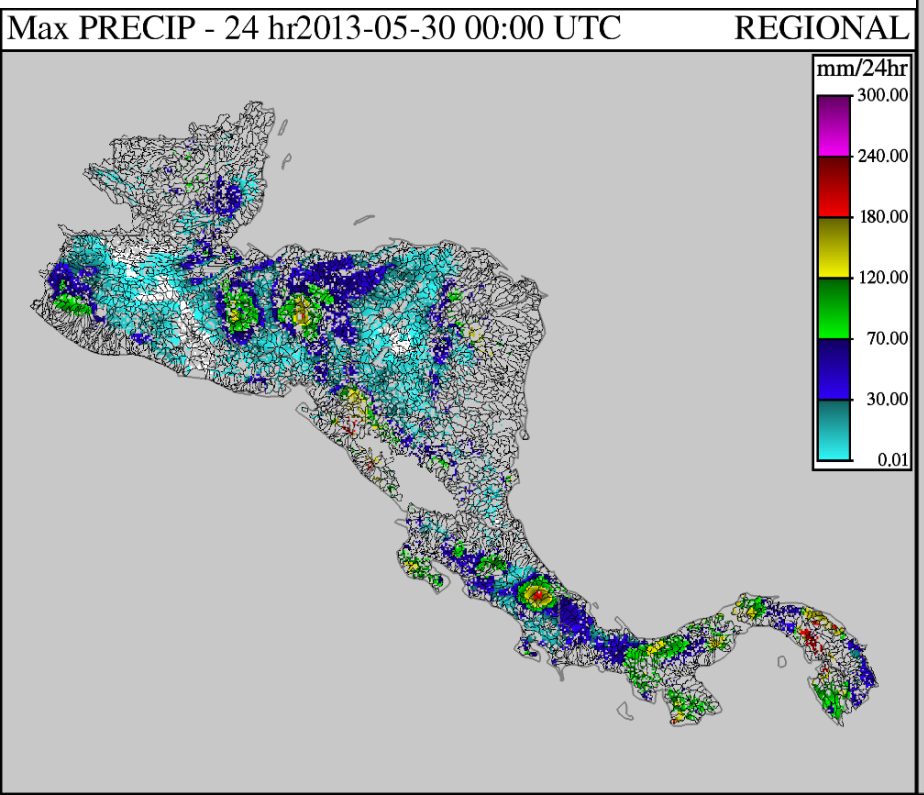
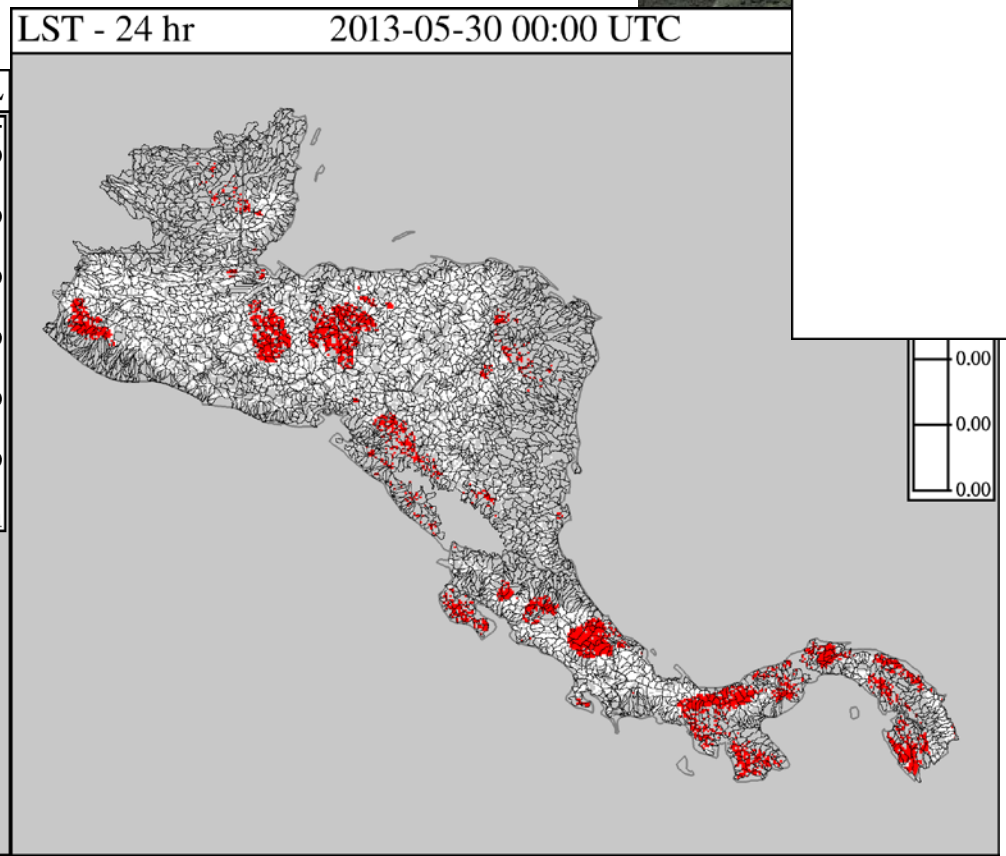
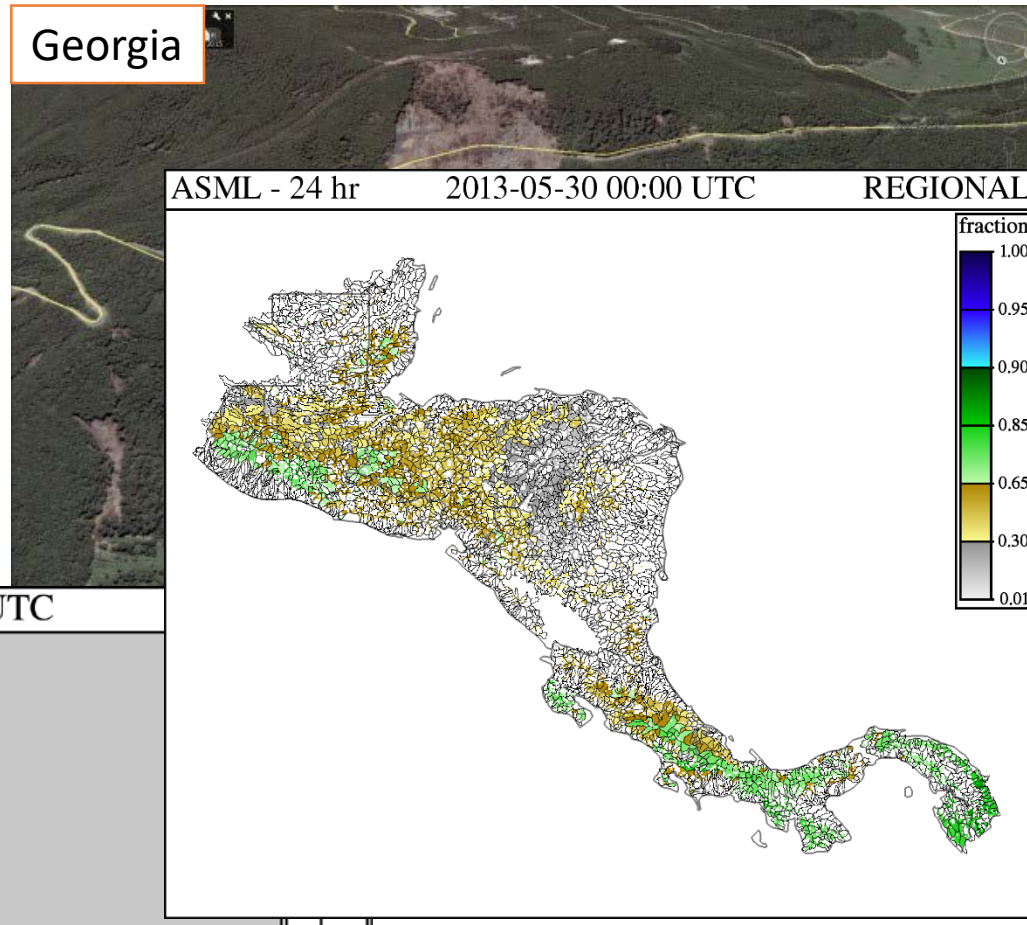


Fig. 8 Landslide susceptibility map for El Salvador from the Normalized Landslide Index Method

Upcoming FFGS new product:
Land Slide Threat [LST]

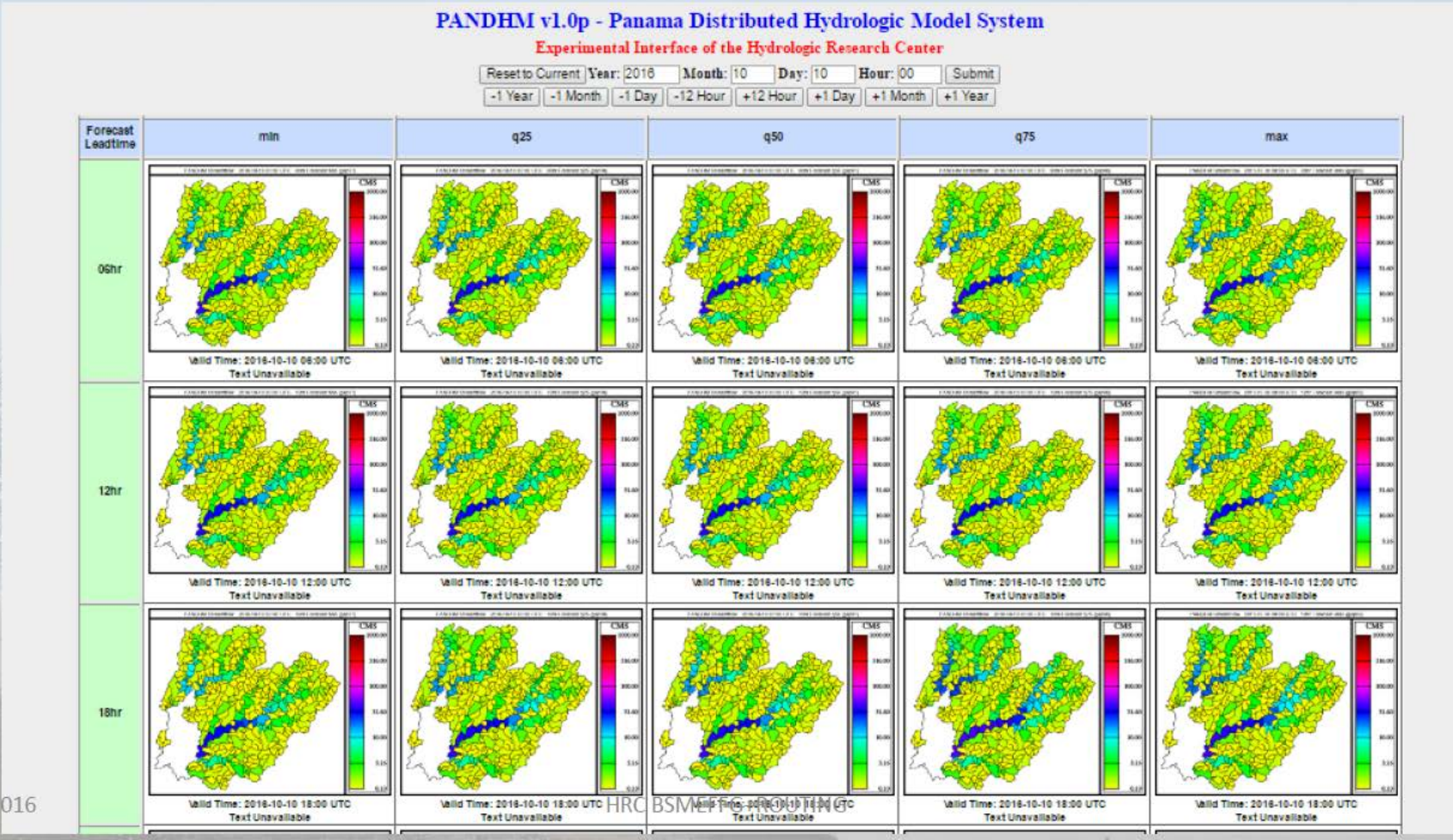






The Flash Flood Guidance System (FFGS) Channel Routing Component

Type of Interface: Forecast Maps



Type of Interface: Ensemble Traces and Table

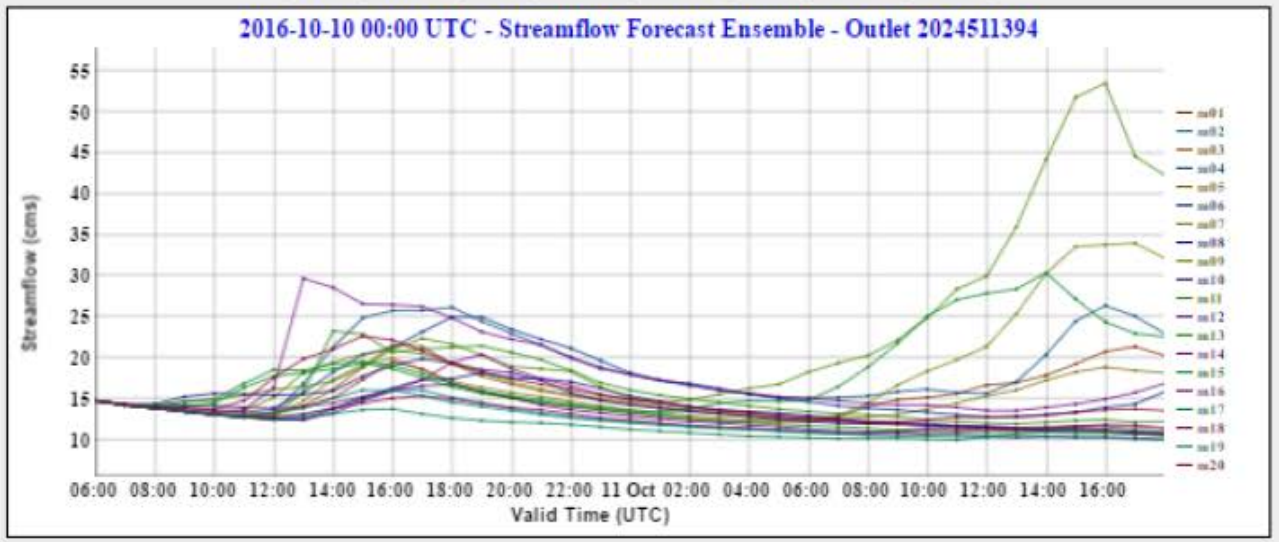
PANDHM v1.0p - Panama Distributed Hydrologic Model System

Experimental Interface of the Hydrologic Research Center

2024511394 - Candelaria

Reset to Current | Year: 2016 | Month: 10 | Day: 10 | Hour: 00 | Submit

-1 Year | -1 Month | -1 Day | -12 Hour | +12 Hour | +1 Day | +1 Month | +1 Year



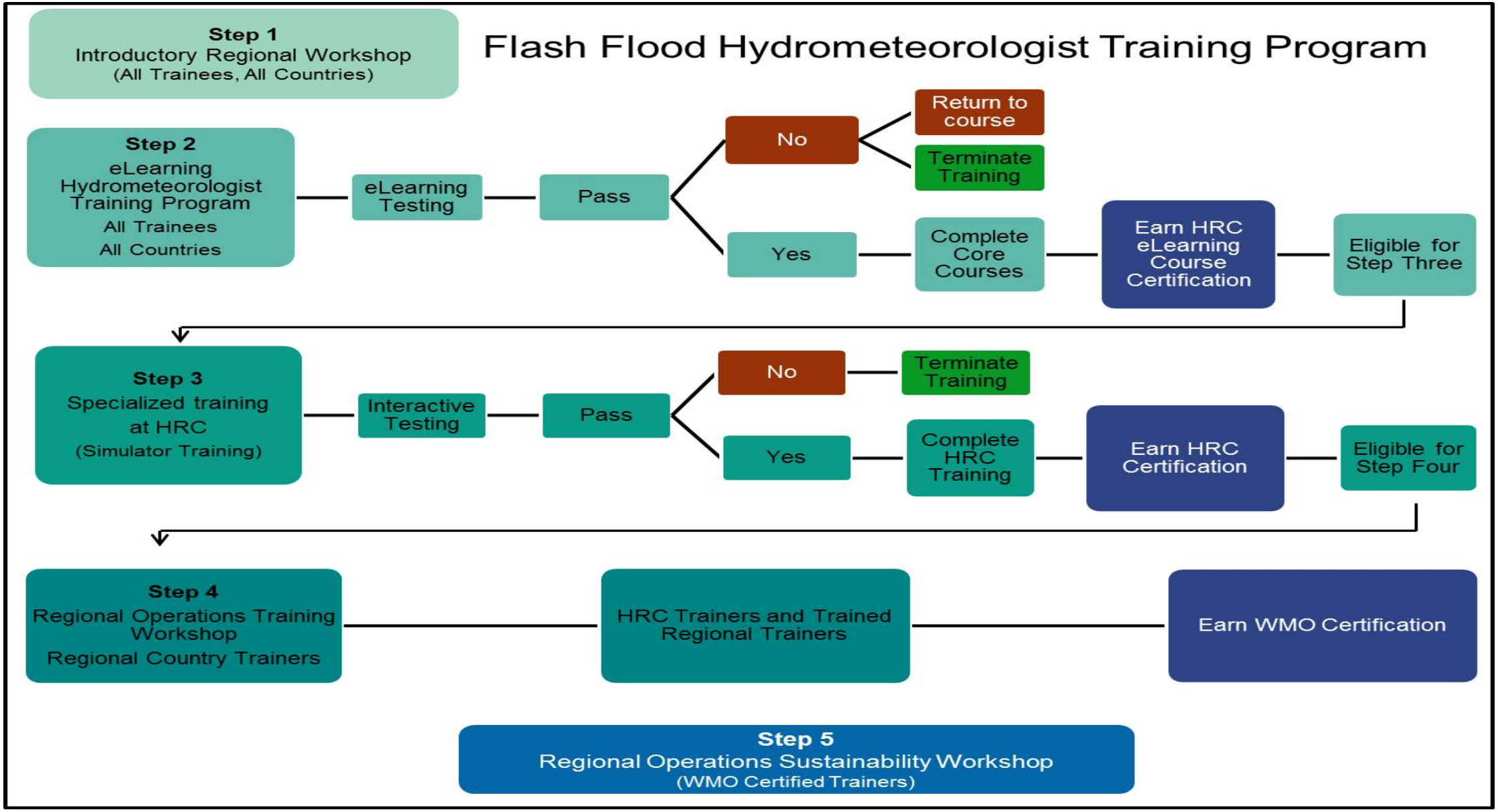
Download the CSV data file: 2016101000_2024511394_streamflow_forecast_basin_ensemble.csv

2016-10-10 00:00 UTC - Streamflow Forecast Ensemble - Outlet 2024511394

Units: cms

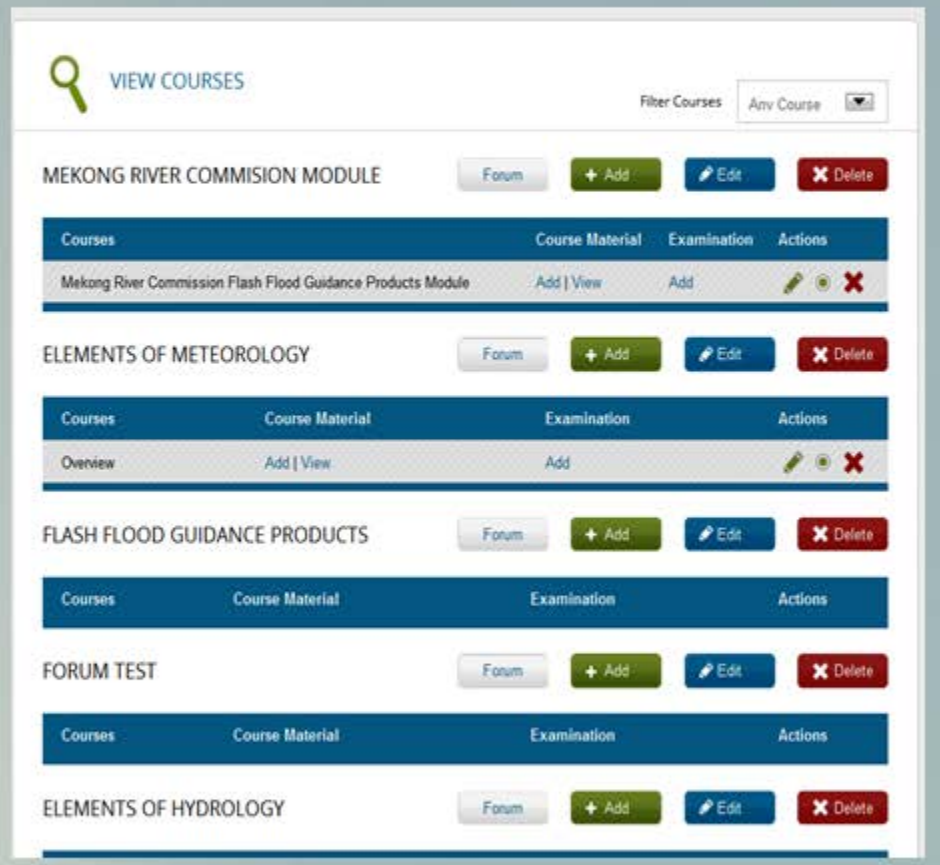
Valid Time	m01	m02	m03	m04	m05	m06	m07	m08	m09	m10	m11	m12	m13	m14	m15	m16	m17	m18	m19	m20
2016-10-10 06:00	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8
2016-10-10 07:00	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.4	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3
2016-10-10 08:00	13.9	13.9	13.9	13.9	13.9	14.2	13.9	13.9	14.2	14.4	13.9	13.9	13.9	13.9	14.2	13.9	13.9	13.9	13.9	14.0
2016-10-10 09:00	13.5	13.5	13.5	13.5	13.5	14.3	13.5	13.5	14.7	15.3	13.5	13.5	14.1	13.7	14.7	13.9	13.5	13.5	13.5	14.0
2016-10-10 10:00	13.1	13.1	13.3	13.1	13.1	14.2	13.2	13.1	14.9	15.7	13.1	13.1	14.5	13.5	15.0	13.7	13.1	13.1	13.1	13.8
2016-10-10 11:00	12.9	12.8	13.3	12.8	12.8	14.0	13.6	12.8	15.5	15.6	12.8	12.9	16.4	13.7	16.9	13.4	12.8	12.9	13.0	14.8
2016-10-10 12:00	13.2	12.7	13.3	13.3	12.9	13.9	15.2	12.5	16.2	15.5	12.9	12.5	17.8	16.4	18.6	13.8	12.6	12.8	13.4	17.6
2016-10-10 13:00	14.1	13.0	14.2	16.9	14.8	15.8	18.2	12.5	16.5	15.6	15.9	12.5	18.2	29.7	18.5	14.1	12.8	13.2	13.9	19.9
2016-10-10 14:00	15.1	13.9	16.2	21.3	17.4	18.3	19.5	13.8	17.2	16.0	23.3	13.3	18.7	28.6	19.3	14.5	13.2	13.9	15.1	21.1
2016-10-10 15:00	17.4	15.0	18.9	24.9	19.2	20.4	20.5	15.2	18.9	17.8	22.9	14.8	19.4	26.6	19.6	15.3	13.7	14.5	16.1	22.7
2016-10-10 16:00	19.6	16.2	21.6	25.8	20.0	21.3	21.0	16.3	21.1	19.1	20.7	16.0	18.7	26.5	19.1	16.1	13.8	15.1	16.1	22.2
2016-10-10 17:00	18.7	16.1	21.4	25.8	18.5	23.2	20.5	17.4	22.4	19.9	21.1	16.6	17.6	26.3	18.1	17.3	13.2	15.4	15.4	20.9
2016-10-10 18:00	16.9	15.2	19.3	26.2	17.2	25.0	19.3	17.6	21.7	19.4	21.3	16.8	16.5	24.9	16.9	19.5	12.7	15.0	14.6	19.4

Flash Flood Hydro-meteorologist Training Program



Coming soon Online Spanish Classes

Flash Flood Hydrometeorologist Training (FFHT) Program



Eight courses

Elements of Meteorology,
Elements of Hydrology,
Hydrometrological Statistics,
Fluvial geomorphology,
GIS basics,
Flash Flood Guidance Model Products,
Remote sensing and
Early warning systems.

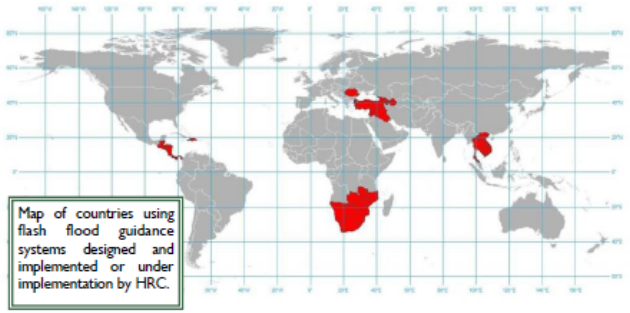
Hydrologic Research Center ~ Linking Science and Society

Quarterly Flash Flood Guidance Gazette [English & Spanish]

Over 400 people on the distribution list mostly from national meteorological and hydrological services

FLASH FLOOD GUIDANCE GAZETTE

Flash Flood Guidance systems around the World



Map of countries using flash flood guidance systems designed and implemented or under implementation by HRC.

Since 1993 the Hydrologic Research Center (HRC) has led the technical development and application of flash flood guidance systems in thirty different countries.

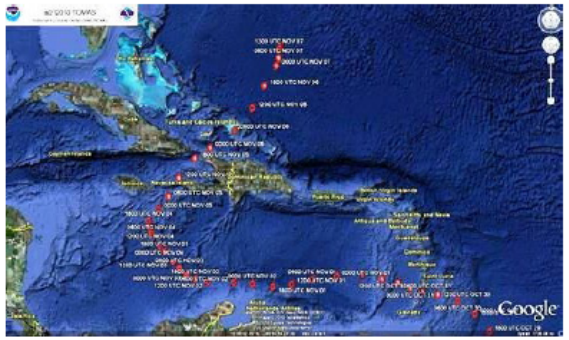
In collaboration with the national meteorological and hydrological services, HRC Flash Flood Guidance systems will serve more than half a billion people worldwide by the end of 2011.

The South Africa Regional Flash Flood Guidance System

The South Africa Regional Flash Flood Guidance (SARFFG) system will be the first fully automated real-time regional flash flood guidance system in the Southern Africa region, in operation in seven countries - South Africa, Botswana, Namibia, Malawi, Mozambique, , Zambia and Zimbabwe in 2011.

The SARFFG system is a diagnostic tool for analyzing weather-related events that can initiate flash floods and is designed to allow the forecaster to add his/her experience with local conditions, incorporate information and any last-minute local observations, to assess the threat of a local flash flood.

Haiti and Hurricane Tomas



On 4th and 5th of November 2010, Haiti was impacted by Hurricane Tomas, with heavy rains and winds over various areas of the country.

Tomas developed from a tropical wave east of the Windward Islands on 29th October and quickly intensified into a hurricane passing near Santa Lucia on 31st October.

During its closest passage to Haiti, Tomas was a Category I Hurricane per the U.S. National Weather Service, National Hurricane Center. See the following discussion to learn how the FFG system was used in Haiti.

Map illustrating the track of Tomas (October 30 to November 7, 2010). Source: U.S. National Weather Service/National Hurricane Center.

For more information on the HDRFFG system see - http://www.hrc-lab.org/right_nav_widgets/realtime_hdrffg/index.php

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Hydrologic Research Center
www.hrcwater.org

Flash Flood Guidance Gazette

Flash Flood Guidance (FFG) Gazette, a bi-annual newsletter bringing users of FFG products all the latest news – operational information, technical advances, case studies and a new e-learning environment for the flash flood community.

Special Issue: Disaster Risk Reduction

The International Day for Disaster Reduction (13th October, 2014) is a day to celebrate how people and communities are reducing their risk to disasters and raising awareness about the importance of Disaster Risk Reduction (DRR). For flash floods and floods community experience can provide the local knowledge and gender perspectives necessary for successful flash flood risk management strategies. Through DRR education it can also provide an understanding of the types, causes, and impacts of flash floods; flash flood hazards, and vulnerability to communities.

A community's DRR education can be the key to development and critical to broad-based economic growth, mitigation of the effects of fragility and conflict, and promoting country security. This is particularly true for areas heavily impacted by natural disasters such as droughts, floods, flash floods and earthquakes. As the sudden and emerging threats from natural disasters challenge individuals, families, communities and countries, educating affected populations becomes not only vital, but a requirement in the rebuilding process.

DRR education is not only a foundation of human development, in emergency situations; it provides physical and psychosocial protection, which can be both life-saving and life-sustaining. It is through education we can develop positive attitudes and responses, which are vital to confront crises, provide a channel for conveying survival messages, and promote personal development and preparedness for responsible citizenry.

Pakistan, Thailand, Haiti and the Philippines have been particularly hard hit in the past few years and the development of DRR programs that support literacy, numeracy and life skills training provide a logical focal point to aid in rebuilding communities. The development of DRR education programs for communities is a systematic approach to identifying, assessing and mitigating the hazards associated with extreme natural hazards. If we focus on floods and flash floods, in particular, an education program aimed at understanding the important characteristics of the physical processes associated with these natural disasters (such as short lead times) and with the potential impacts (such as the ability of as little as two feet of flowing water to carry away cars) allows the learner to pose and answer certain fundamental questions pertaining to the learners own situation. This practical approach where the learners understand their role and are given an opportunity to participate is one way to create an atmosphere of awareness with individuals, families and communities. It is by the knowledge the learner gains from understanding these and other natural disasters and their impact that can reduce the risk, empower the citizenry and advance approaches to mitigation and adaptive management strategies.

The following articles provide examples of educational programs that involve individuals, families and communities.

Contributor
Rochelle Graham
Hydrologic Research Center