



WORLD  
METEOROLOGICAL  
ORGANIZATION



**USAID**  
FROM THE AMERICAN PEOPLE



# Myanmar Flash Flood Guidance Systems

Initial planning meeting, Nay Pyi Taw, Myanmar  
26-28 February, 2018



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Hydrologic Research Center  
San Diego, California



# Hydrologic Research Center [HRC] San Diego, California U.S.

## Development Team

**Dr. Konstantine Georgakakos, Director**  
**Mr. Robert Jubach, General Manager**  
**Dr. Eylon Shamir**  
**Dr. Theresa Modrick**  
**Dr. Rochelle Graham**  
**Dr. Zhengyang Chang**



## I.T.

**Mr. Jason Sperflage**  
**Mr. Cris Spencer**  
**Mr. Randall Banks**

The Hydrologic Research Center is a public benefit nonprofit organization.

HRC's goal is to help bridge the gap between scientific research and applications for the solution of important societal problems that involve water.

# Global Flash Flood Guidance Program

- The implementation of Flash Flood Guidance systems globally is a program to provide a [tool for National Meteorological and Hydrologic Services](#) to develop flash flood alerts, watches and warnings.
- The program addresses the need to provide early warnings for flash floods in the development of [regional approaches to flash flood issues](#).
- The program is a partnership between the Hydrologic Research Center, the World Meteorological Organization, the U.S. Agency for International Development/Office of U.S. Foreign Disaster Assistance, and the U.S. National Oceanic and Atmospheric Administration.

**Memorandum Of Understanding is in place**

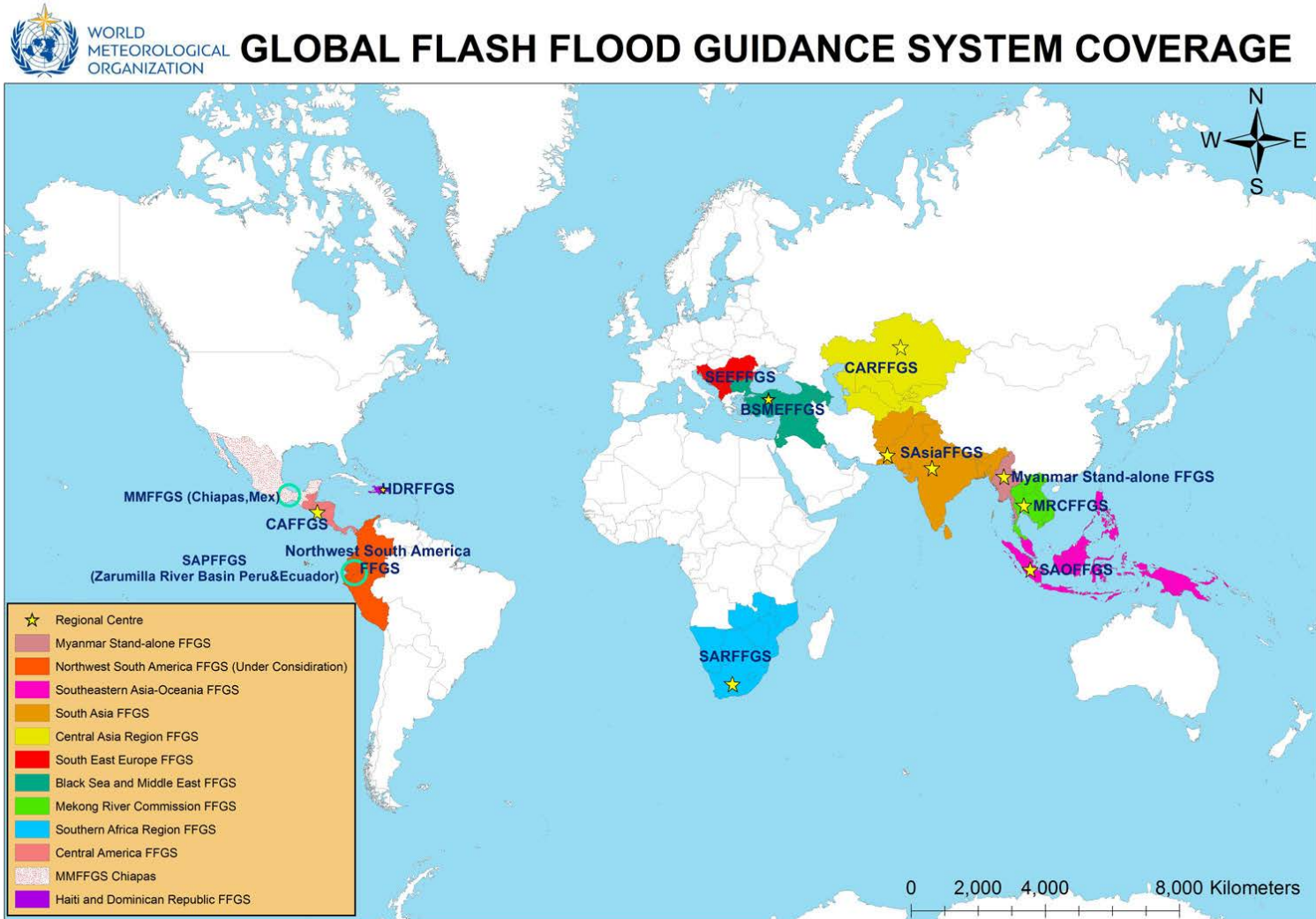


**HYDROLOGIC RESEARCH  
CENTER**

A Nonprofit Research Corporation



# Global Flash Flood Guidance



# The Role of the Hydrologic Research Center

- Developed the FFGS concept and system design
- Tailor the FFG systems for the specific of the region (data, geomorphology and hydrometeorology)
- Implement the systems at the selected regional center and provide technical support
- Train forecasters to use the FFGS and in order to produce prompt flash flood warnings.
- Maintain and enhance the FFG Systems



# Tailor the FFG systems for the specific of the region

## Product Console

**BSMEFFG - Black Sea Middle East Flash Flood Guidance System**

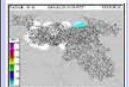
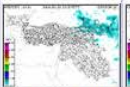
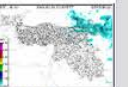

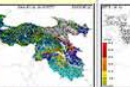
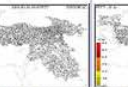
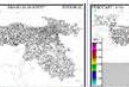
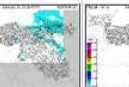
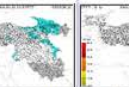

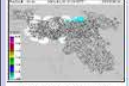
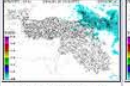

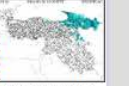
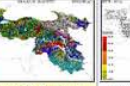
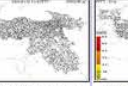
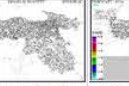
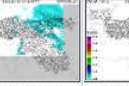
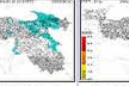

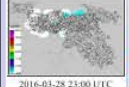
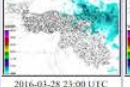

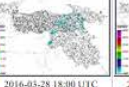
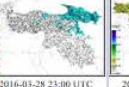
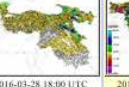
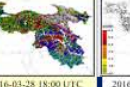
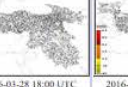
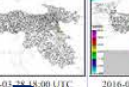
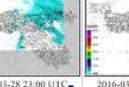
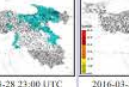

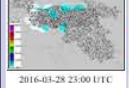

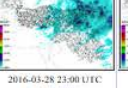
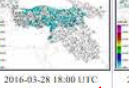
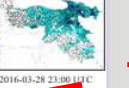
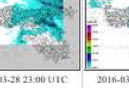

Current Date: **2016-06-21 13:04 UTC**      Nav Date: **2016-03-28 23:00 UTC**

Year: 2016   Month: 03   Day: 28   Hour: 23   REGION: REGIONAL   Submit

[-1 Month](#)   [-1 Day](#)   [-6 Hours](#)   [-1 Hour](#)   [+1 Hour](#)   [+6 Hours](#)   [+1 Day](#)   [+1 Month](#)  
[Prev 8-hr Interval \(18 UTC\)](#)   [Reset to Current](#)   [Next 8-hr Interval \(00 UTC\)](#)

Product Table

Navigation

DT	RADAR Precipitation	MWGHE Precipitation	GHE Precipitation	Gauge MAP	Merged MAP	ASM	FFG	IFFT	PFFT	ALADIN Forecast	FMAP	FFFT
01-hr	 <small>2016-03-28 23:00 UTC</small>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>		 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>		 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 19:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>
03-hr	 <small>2016-03-28 23:00 UTC</small>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>		 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>		 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 21:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>
06-hr	 <small>2016-03-28 23:00 UTC</small>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>
24-hr	 <small>2016-03-28 23:00 UTC</small>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 18:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>					 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	 <small>2016-03-28 23:00 UTC</small> <a href="#">Text view</a>	

Composite Product: [text](#), [CSV](#), [CSVt](#)      SFTP data transfer (requires SFTP Client): [EXPORTS/REGIONAL/2016/03/28](#)

Surfnet Gauge Observations at 2016-03-28 18:00 UTC

Station Identifier	Station Name	Accumulated Precipitation (mm/06hr)	Average Temperature (C)	Snow Depth (cm)	Snow Cover (Inches)	Region	Latitude	Longitude	Elevation	Enable Precipitation Flag	Enable Temperature Flag
15502	Vidin	0.00	13.80	No Report	No Report	BULGARIA	43.9942	22.8525	31	Enabled	Enabled
15524	Lovech	0.00	12.05	No Report	No Report	BULGARIA	43.1631	24.7066	220	Enabled	Enabled
15549	Razgrad	0.00	9.90	No Report	No Report	BULGARIA	43.5661	26.5078	346	Enabled	Enabled
15552	Varna	0.00	7.75	No Report	No Report	BULGARIA	43.2125	27.9522	39	Enabled	Enabled
15600	Murgash	0.00	1.30	No Report	No Report	BULGARIA	42.8333	23.6683	1687	Enabled	Enabled
15614	Sofia	0.00	11.80	No Report	No Report	BULGARIA	42.6553	23.3847	586	Enabled	Enabled
15615	Musala	0.00	-8.85	No Report	No Report	BULGARIA	42.1797	23.5866	2925	Enabled	Enabled

Text Downloads

# U.S. National Weather Service's FFGS Role



# Operational datasets provided by NOAA/NWS to support FFG systems

Variable	Product	NOAA/NWS Office
Operational QPE	Global Hydro-Estimator [GHE]	Office of Satellite and Product Operations [OSPO]
Operational QPE	CMORPH	Climate Prediction Center [CPC]
Operational Snow Areal Extent	Interactive Multisensor Snow and Ice Mapping System [IMS]	National Ice Center [NIC]
Operational Boundary Conditions for WRF and Surface Air Temperature	Global Forecast System (GFS)	National Centers for Environmental Prediction [NCEP]
Historical Gauge Rainfall Data. Data are used for the systems development and calibration		National Centers for Environmental Information (NCEI)



# Training and Expertise

- During Step–III training at HRC, trainees visit the NWS Forecast Office San Diego California





**THANK YOU**