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WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Overview of the global FFGS



WMO OMM


World Meteorological Organization

Organisation météorologique mondiale

Definition of the Problem

While there are several types of floods, **flash floods are the most dangerous.**

Flash Flood is:

- a flood of short duration with a relatively high peak discharge usually having less than 6 hours between the occurrence of the rainfall and the peak;
 - short fuse, hard to predict events;
 - causing annually an average of 5,000 deaths and inflict heavy economical losses worldwide;
- 
- lack of flash flood forecasting tools;
 - lack of flash flood warning capabilities and capacities of NHMSs;
 - lack of local expertise and regional cooperation; and
 - ineffectiveness of riverine flood warning systems for flash floods

Integrated Flood Management Tools Series No. 16, WMO, 2012



The Main Objective

The main objective of the Flash Flood Guidance System with global coverage is to:

- enhance NMHSs capacities to issue timely and accurate flash flood warnings to mitigate the adverse impacts of hydrometeorological hazards, by:
 - generating flash flood early warning products using state-of-the-art hydrometeorological forecasting models;
 - providing extensive training to the hydrometeorological forecasters; and
 - improving collaboration between NMHSs and Disaster Management Agencies (DMA).

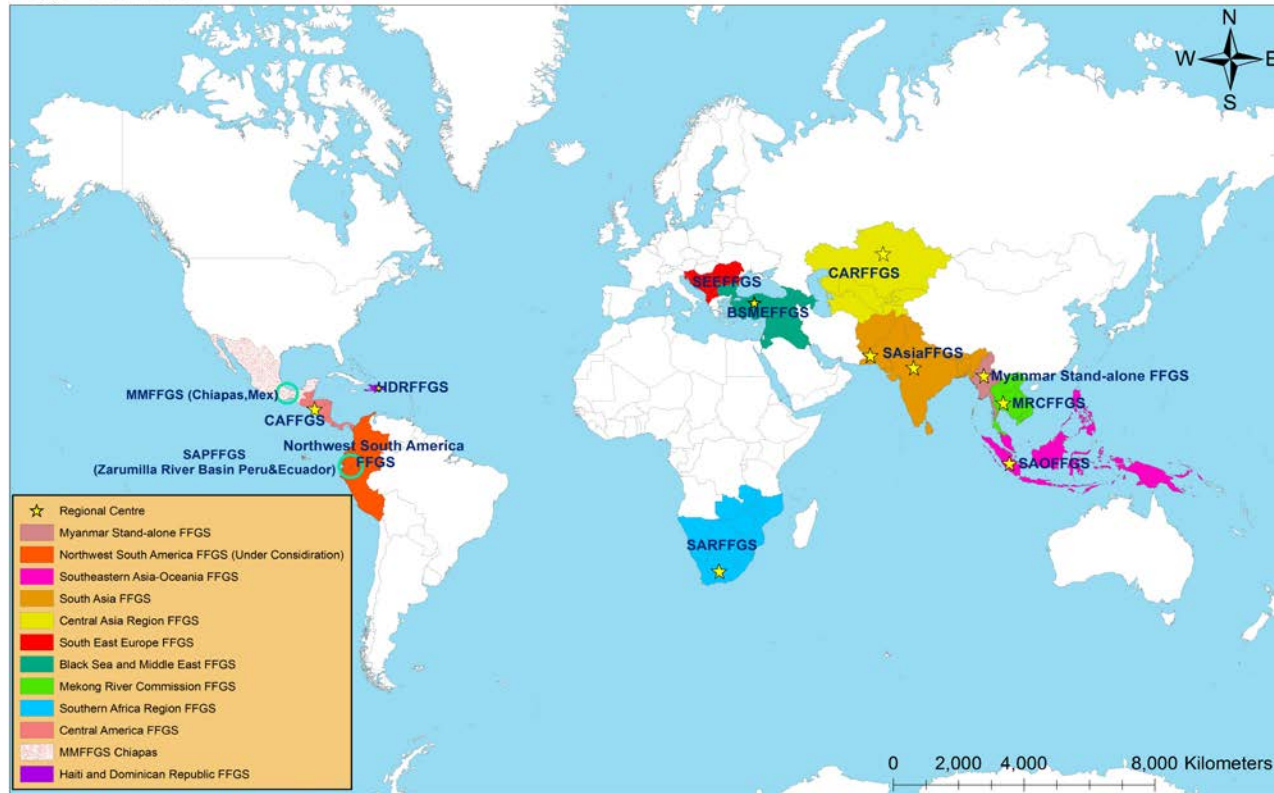


Global Coverage



WORLD
METEOROLOGICAL
ORGANIZATION

GLOBAL FLASH FLOOD GUIDANCE SYSTEM COVERAGE



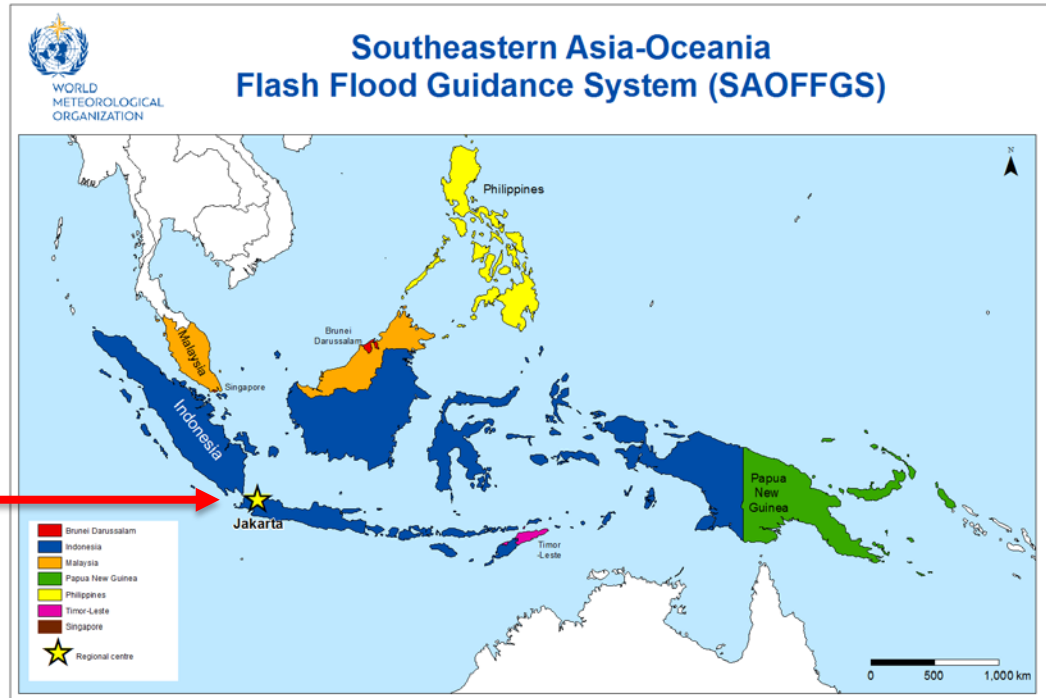
The Flash Flood Guidance System with Global Coverage currently covers fifty two countries and more than two billion people around the world, saving lives and reducing economic losses.



Regional Components

The Regional Centre is to:

- Provide FFGS forecast products and data to the participating countries,
- collaborate with WMO and its project partners to implement flash flood hydrometeorologist training programme,
- evaluate FFG products from the regional perspective and conduct verification study in collaboration with the participating NMHSs, and
- have good IT infrastructure for data exchange and internet connection.



The Participating NMHSs are to:

- Prepare and issue flash flood warnings and alerts to the public and national agencies including Disaster Management Agencies,
- provide historical and in-situ local data to the FFG system developer through the RC,
- participate in the Flash Flood Hydrometeorologist Training Programme (Steps 1-5), and
- conduct verification studies.



Regional FFGS Projects

The following regional Flash Flood Guidance (FFG) projects have been implemented or under implementation:

- **Central America FFG (CAFFG)** (Operational): Costa Rica (Regional Centre (RC), Belize, El Salvador, Guatemala, Honduras, Nicaragua, and Panama;
- **Southern Africa Region FFG (SARFFG)**: (Operational) Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa (RC), Swaziland, Zambia, and Zimbabwe;
- **Mekong River Commission FFG (MRCFFG)** (Operational): Cambodia (RC), Lao People's Democratic Republic, Thailand, and Viet Nam;
- **Black Sea and Middle East FFG (BSMEFFG)** (Operational): Armenia, Azerbaijan, Bulgaria, Georgia, Israel, Jordan, Lebanon, and Turkey (RC);
- **South East Europe FFG (SEEFFG)** (Operational): Albania, Bosnia-Herzegovina, Croatia, Moldova, Montenegro, Romania, Serbia, Slovenia, The Former Yugoslav Republic of Macedonia, and Turkey (RC);

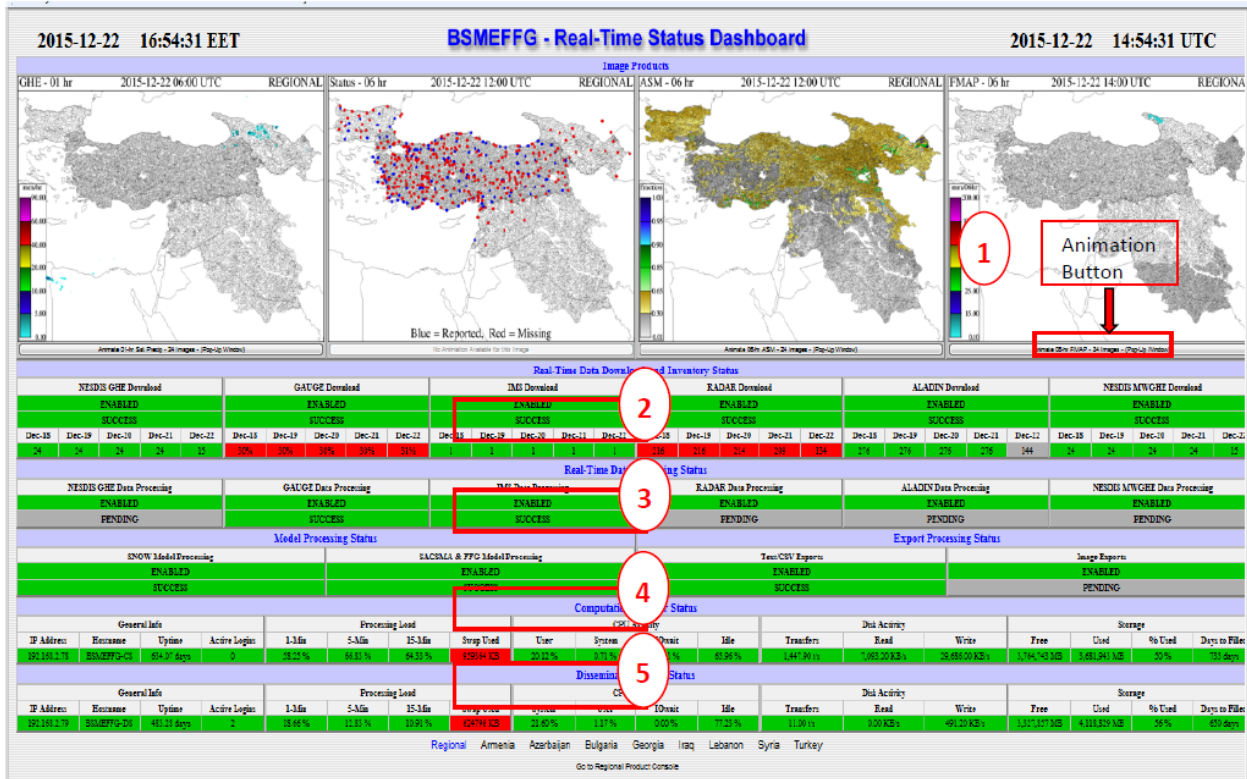


Regional FFGS Projects

- **Southeastern Asia-Oceania FFG (SAOFFG)** (under implementation): Brunei Darussalam, Indonesia, Malaysia, Papua New Guinea, Philippines, Singapore, and Timor-Leste;
- **South Asia FFG (SAsiaFFG)** (under implementation): Afghanistan, Bangladesh, Bhutan, India (RC), Nepal, Pakistan (RC), and Sri Lanka;
- **Central Asia Region FFG (CARFFG)** (under implementation): Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan;
- **South America Pilot FFG** (Completed): Zarumilla River Basin (Peru and Ecuador); and
- **Haiti and Dominican Republic FFG (HDRFFG)** (being upgraded): Dominican Republic and Haiti.



FFGS Dashboard



Dashboard is designed to monitor server processes:

- (1) Quick-look;
- (2) Real-Time data downloads and inventory status;
- (3) Real-Time Data processing status;
- (4) Computational server status; and
- (5) Dissemination server status.



FFGS Interface

CAFFG - Central America Flash Flood Guidance System

Current Date: 2017-04-23 21:54 UTC Nav Date: 2017-04-23 21:00 UTC

Year: 2017 Month: 04 Day: 23 Hour: 21 REGION: REGIONAL OPTION: MEDIAN

Time Interval: 1 Hour Refresh Interval: 15 UTC Next Refresh Interval: 00 UTC

Products, Date and Time Selection Toolbar

DT	MWGHE Precipitation	GHE Precipitation	Gauge MAP	Merged MAP	ASM	FFG	IFFT	PFFT	WRF Forecast	WRF FMAP	WRF FFFT
00-1r	Image Unavailable										
01-1r	Image Unavailable										
02-1r	Image Unavailable										
03-1r	Image Unavailable										

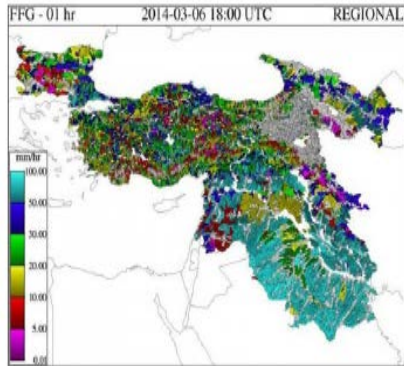
FFGS Products

Surface Met. Observations

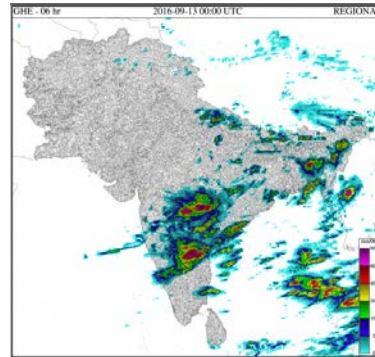
Station Identifier	Station Name	Interpolated Precipitation	Average Temperature (C)	Flags	Latitude	Longitude	Station	Enable Precipitation Flag	Enable Temperature Flag
08070	Ligle	0.00	19.79	OSTRICAL	10.07	-82.07	00	Enabled	Disabled
08072	Ligle La Femme San Carlos	0.00	19.79	OSTRICAL	10.07	-82.02	00	Enabled	Disabled
13110	San Jose Finca	0.00	19.79	OSTRICAL	10.03	-82.83	12	Enabled	Disabled
13112	Pajama	0.00	19.79	OSTRICAL	9.82	-82.82	10	Enabled	Disabled
20100	San Jose CCR	0.00	19.79	OSTRICAL	10.86	-82.82	10	Enabled	Disabled



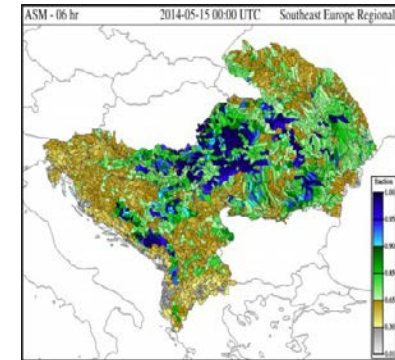
FFGS Products



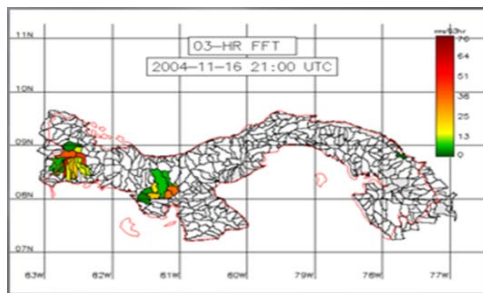
Flash Flood Guidance (FFG)
for the BSMEFFG System



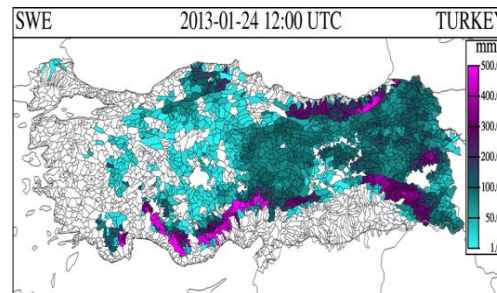
GHE Satellite precipitation
for the SAsiaFFG System



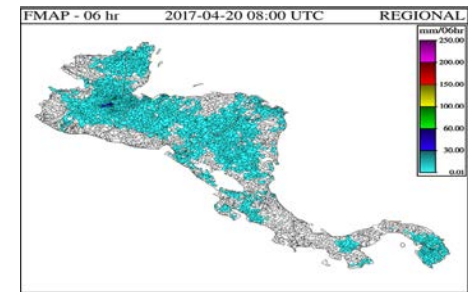
Average Soil Moisture (ASM)
for the SEEFFG System



Flash Flood Threat (FFT)
for the CAFFG System



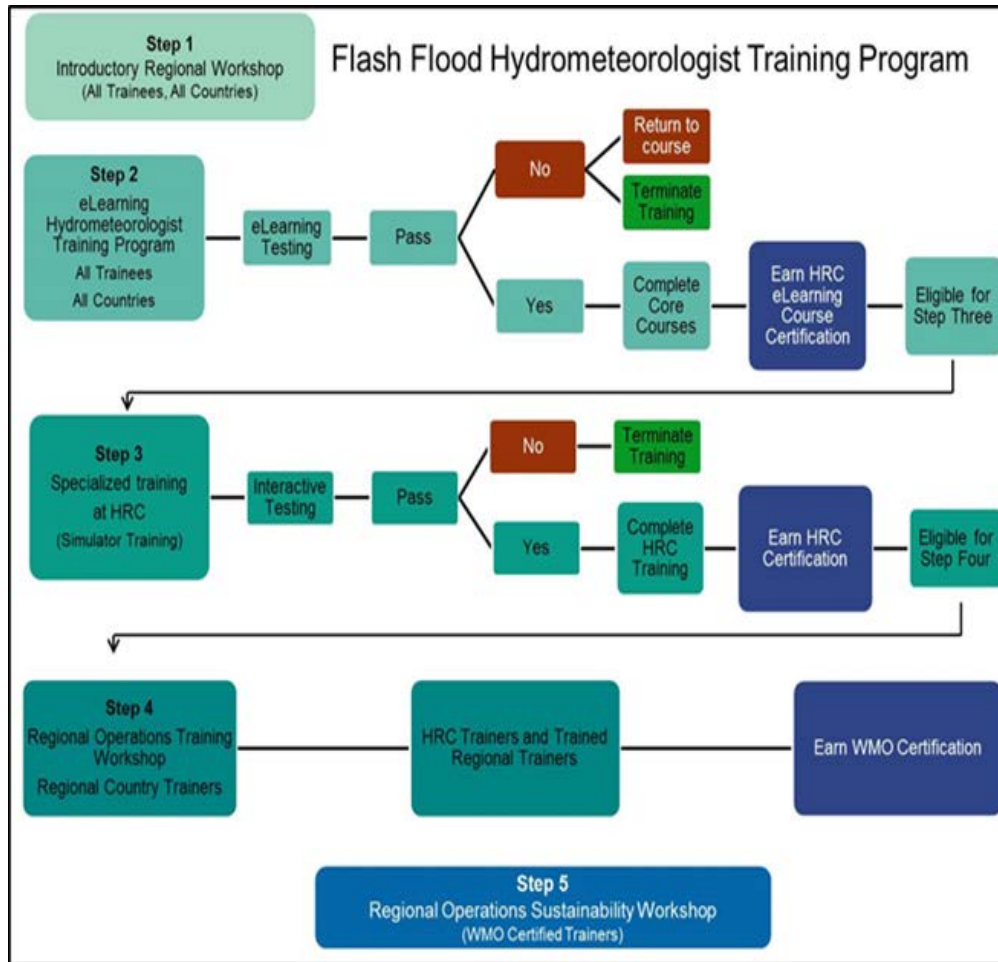
Snow Water Equivalent (SWE)
for the Turkey



Forecast Mean Areal
Precipitation (FMAP)
for the CAFFG



Flash Flood Hydrometeorologist Training Programme

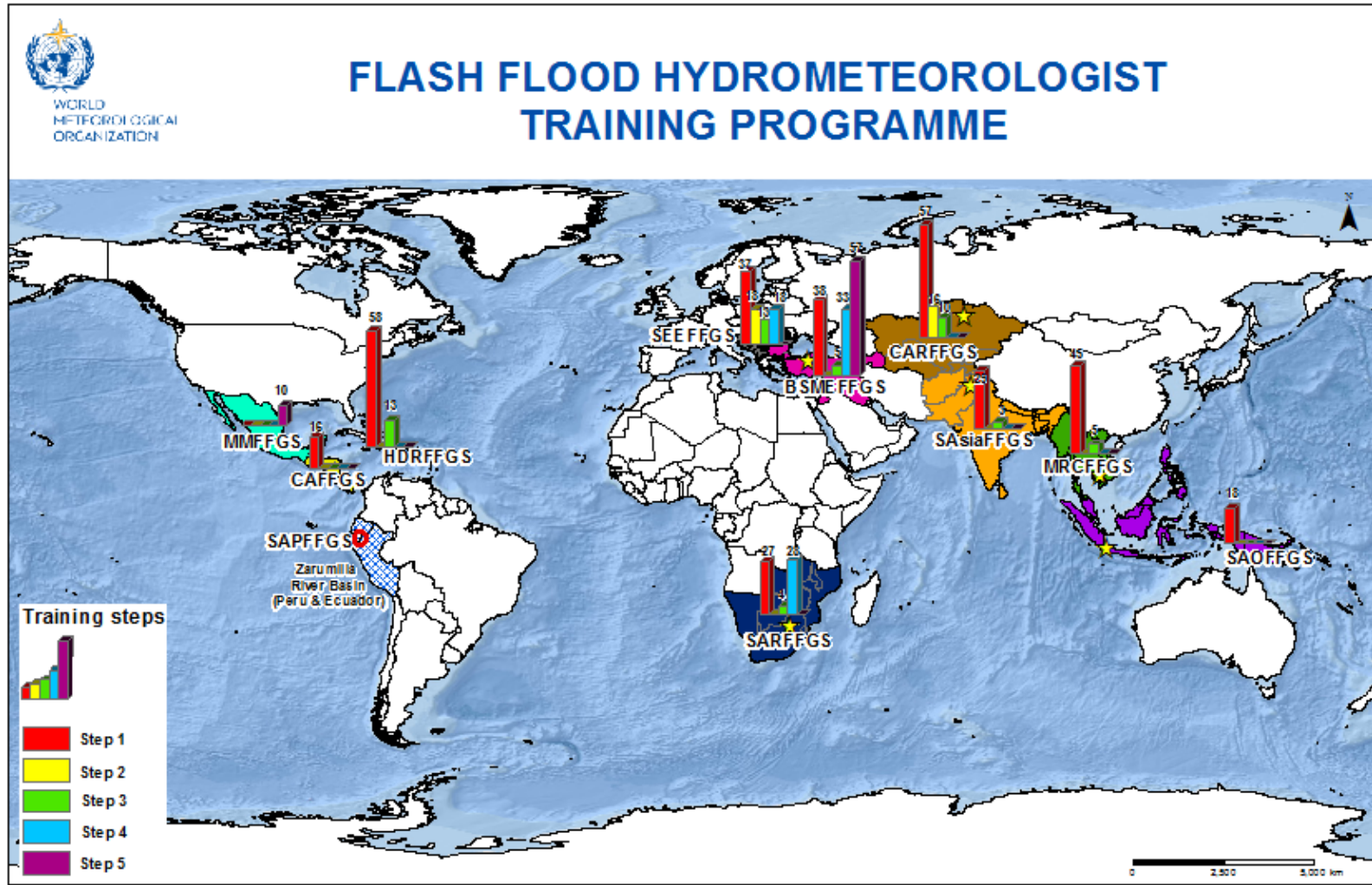


Training is an integral part of regional FFG Systems and consists of five steps:

- Step-1:** Introductory in-country workshops and meetings such as Steering Committee Meetings;
- Step-2:** On line eLearning comprises elements of meteorology, hydrology, flash flood guidance, GIS, and remote sensing;
- Step-3:** Advanced operations and interactive simulator training at the Hydrologic Research Center (HRC), USA;
- Step-4:** Regional operations training workshop toward qualification of WMO flash flood trainer certificate;
- Step-5:** Regional operation sustainability workshop provided by the WMO certified trainer.



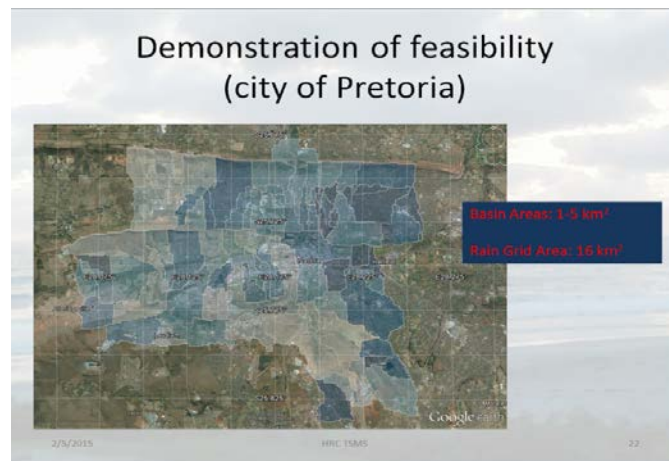
Flash Flood Hydrometeorologist Training Programme – Training Statistics



Advances

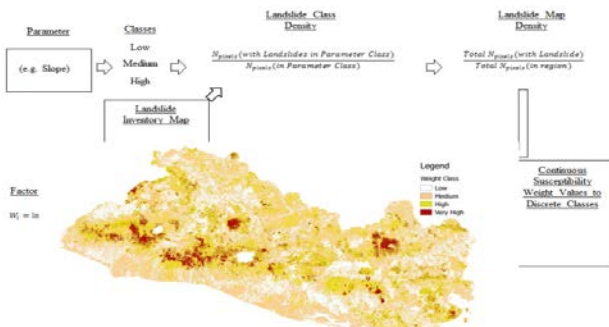
Forecast Products						
DT	WRF D01 Forecast	WRF D01 FMAP	WRF D01 FFFT	WRF D02 Forecast	WRF D02 FMAP	WRF D02 FFFT
01-hr						
03-hr						
	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view
06-hr						
	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view
24-hr						
	2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view		2016-10-02 00:00 UTC Text view	2016-10-02 00:00 UTC Text view	

Multi-NWP Model ingestion

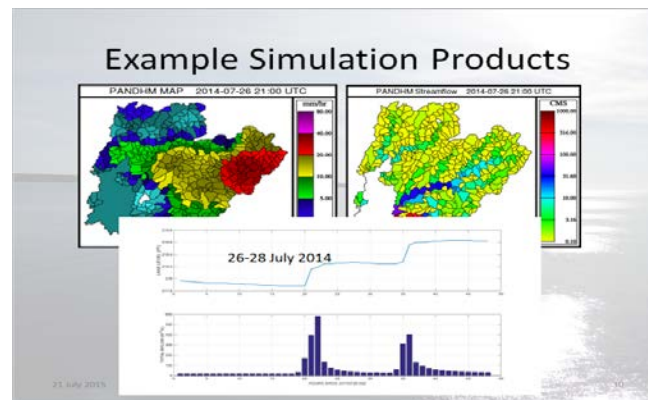


Urban Flash Flood Early Warning System

C.1 Susceptibility Mapping



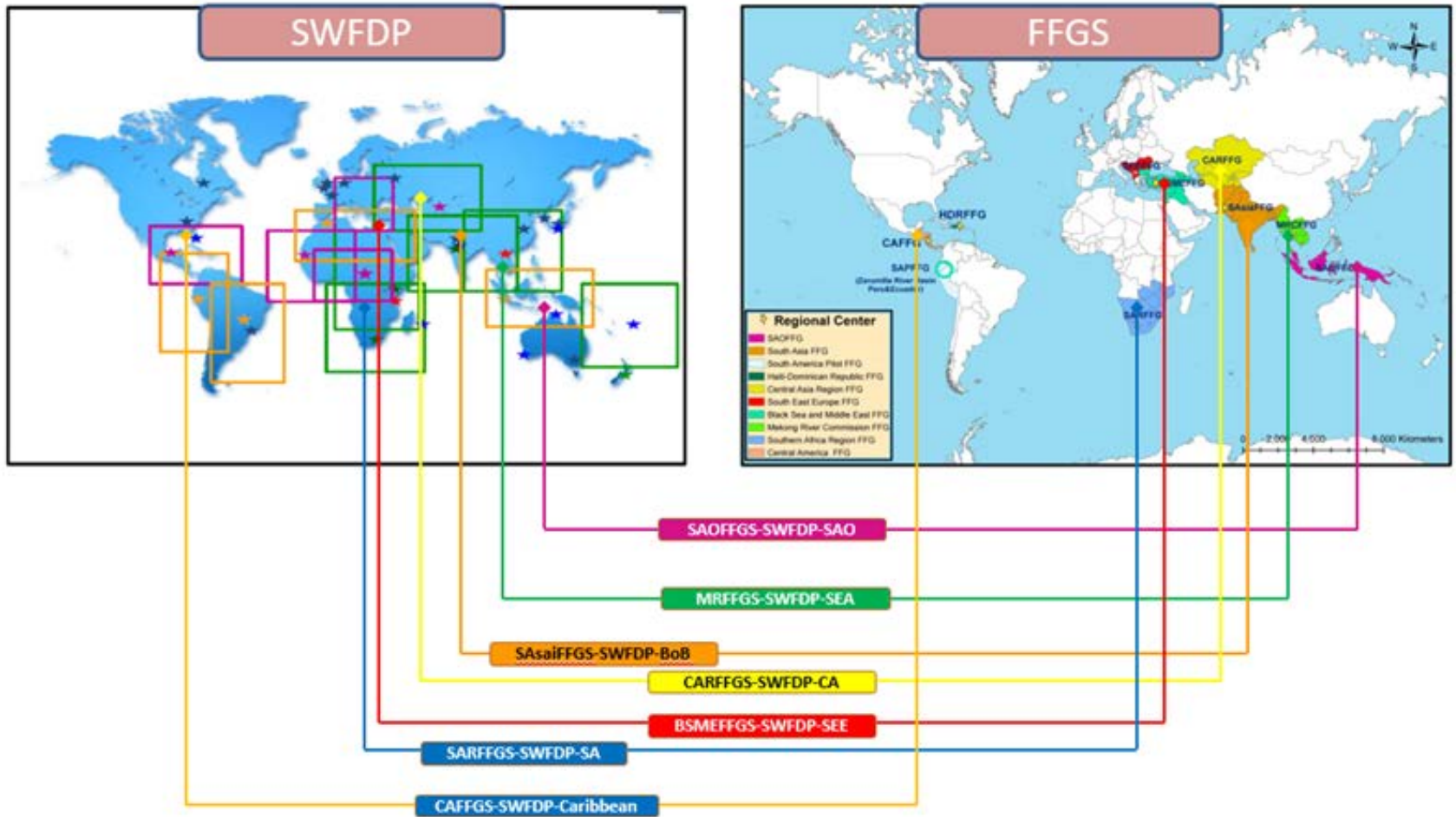
Landslide Susceptibility Mapping



Expandable and Scalable Riverine Routing (Riverine Forecasting)



Linkages between SWFDP and FFGS Regional Systems



Thank you

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WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

For more information pls visit:

<http://www.wmo.int/ffgs>

<http://www.hrcwater.org>