WEATHER CLIMATE WATER
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# 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;

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

**The problems are:**

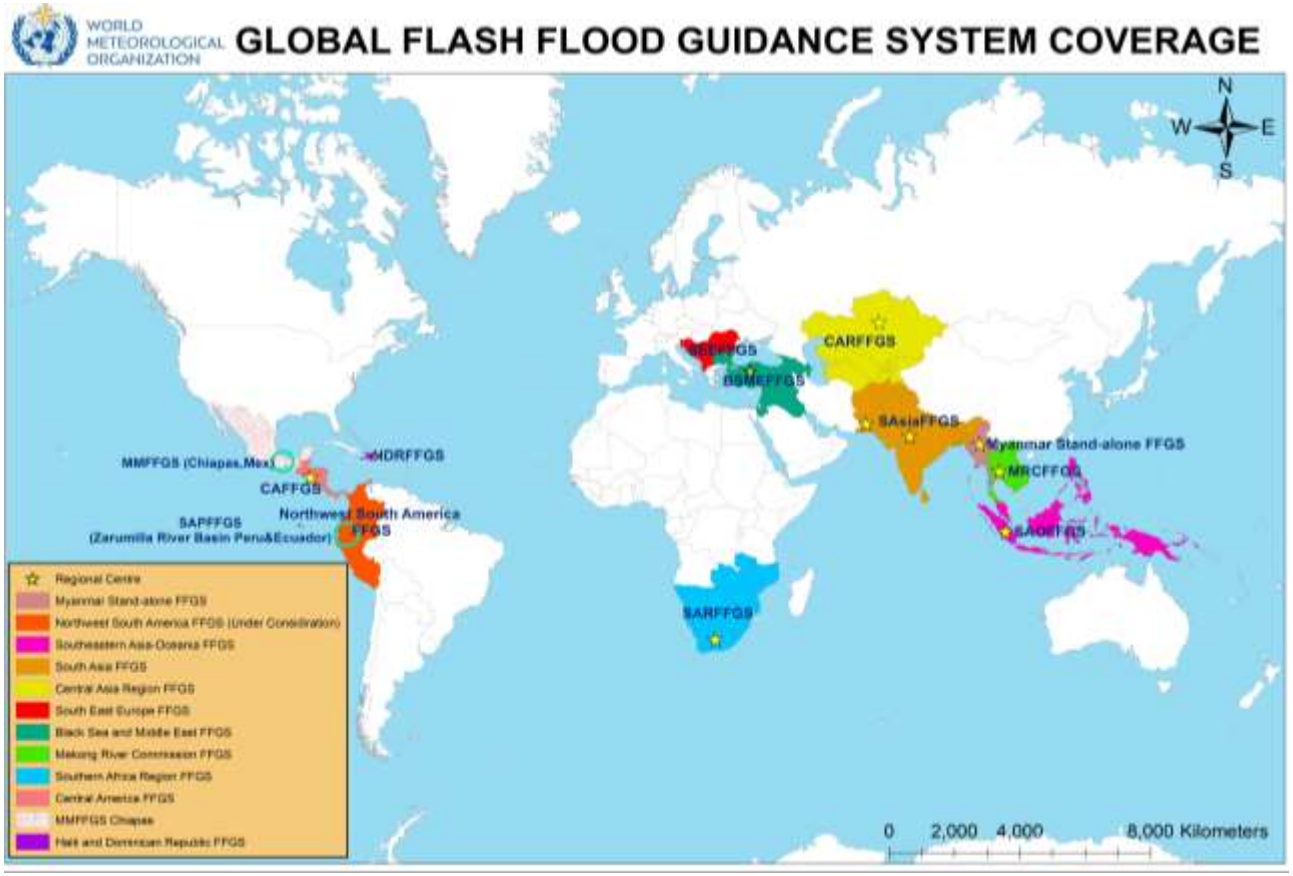
- lack of flash flood forecasting tools;
- lack of flash flood warning capabilities and capacities of NHMSs;
- lack of local expertise and regional cooperation; and
- ineffectiveness of riverine flood warning systems for flash floods

# Objectives of the FFGS with Global Coverage

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

- Enhance NMHSs capacity to issue flash flood warnings and alerts;
- Mitigate adverse impacts of hydrometeorological hazards;
- Enhance collaborations between NMHSs and Emergency Management Agencies;
- Generate flash flood early warning products by using state-of-the-art hydrometerological forecasting models;
- Provide extensive training including on-line training to the hydrometeorological forecasters;
- Foster regional developments and collaborations; and
- Support WMO Flood Forecasting Initiative.

# Global Coverage




The Flash Flood Guidance System with Global Coverage currently covers more than **sixty 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

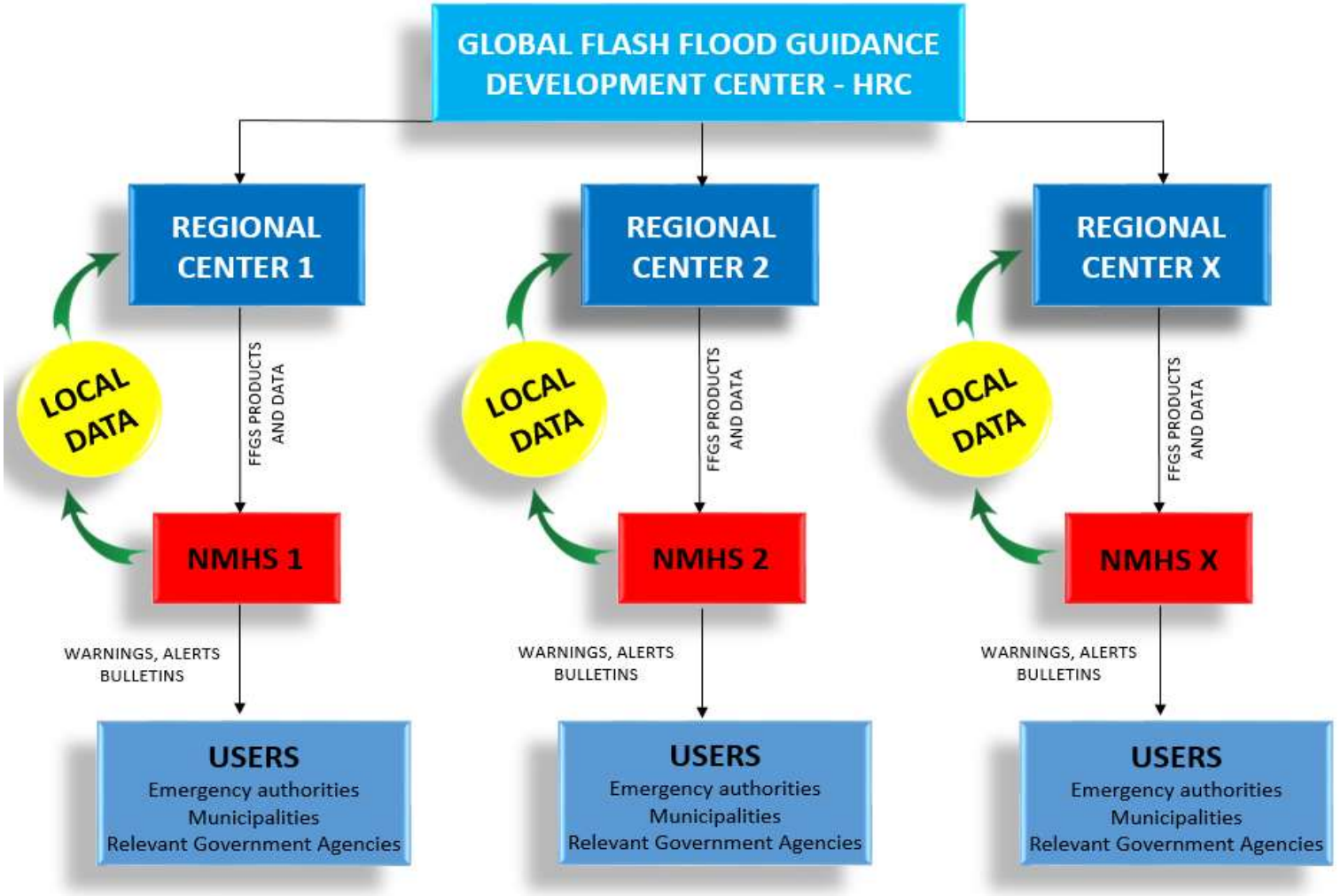
**The following regional Flash Flood Guidance (FFG) projects have been implemented or under implementation:**

- **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);

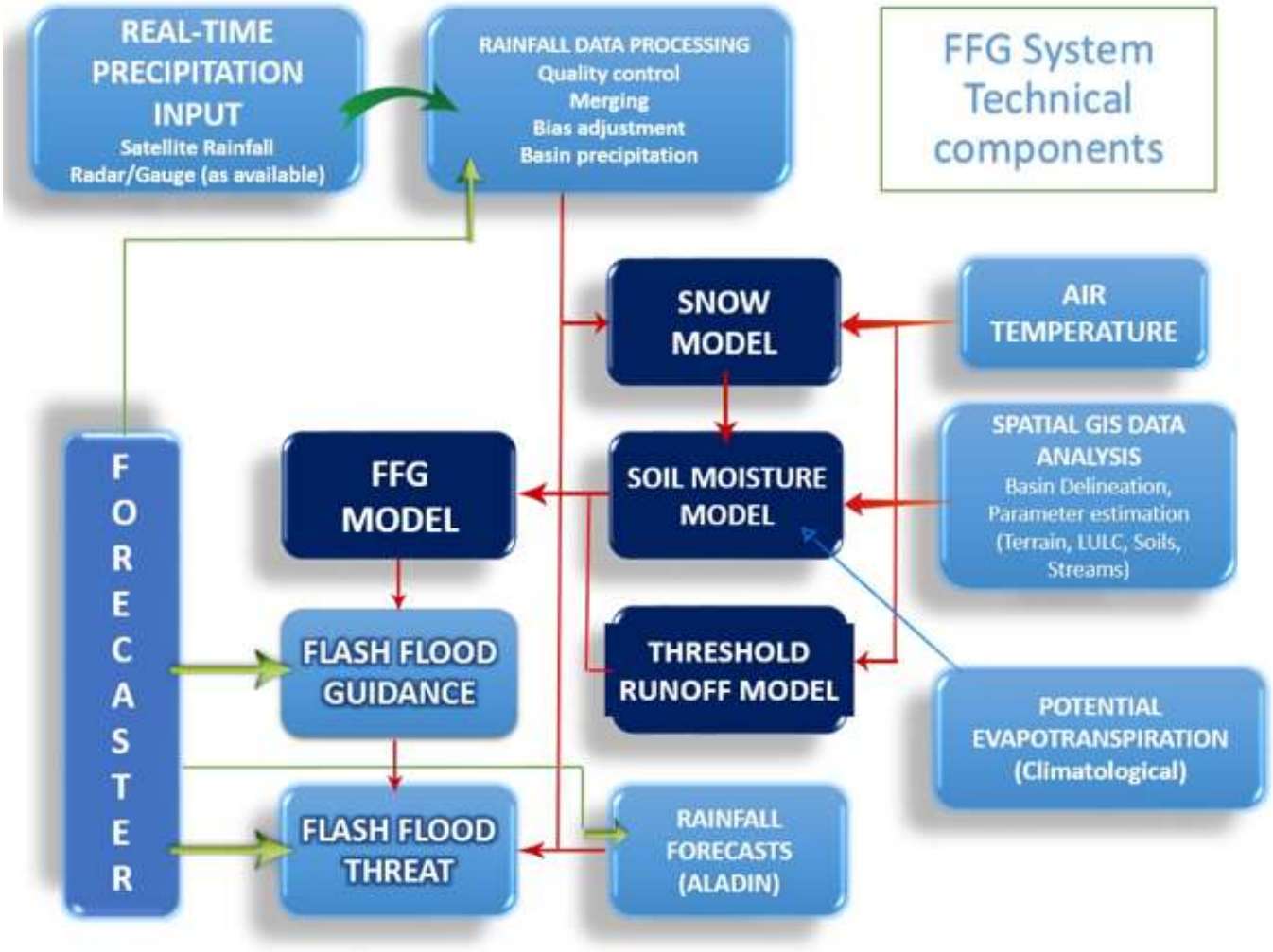
# Regional FFGS Projects

- **Southeastern Asia-Oceania FFG (SAOFFG)** (under implementation): Brunei Darussalam, Indonesia (RC), 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;
- **South East Asia FFG (SEAFFG)** (under implementation): Cambodia, Lao PDR, Thailand, and Viet Nam;
- **Central Asia Region FFG (CARFFG)** (under implementation): Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan;
- **South America Pilot FFG** (Completed): Zarumilla River Basin (Peru and Ecuador);
- **Haiti and Dominican Republic FFG** (**HDRFFG**) (being upgraded): Dominican Republic and Haiti;
- **Myanmar stand-alone FFG System** (under implementation**).**

# Global FFGS Programme Concept



# FFGS Modeling Components



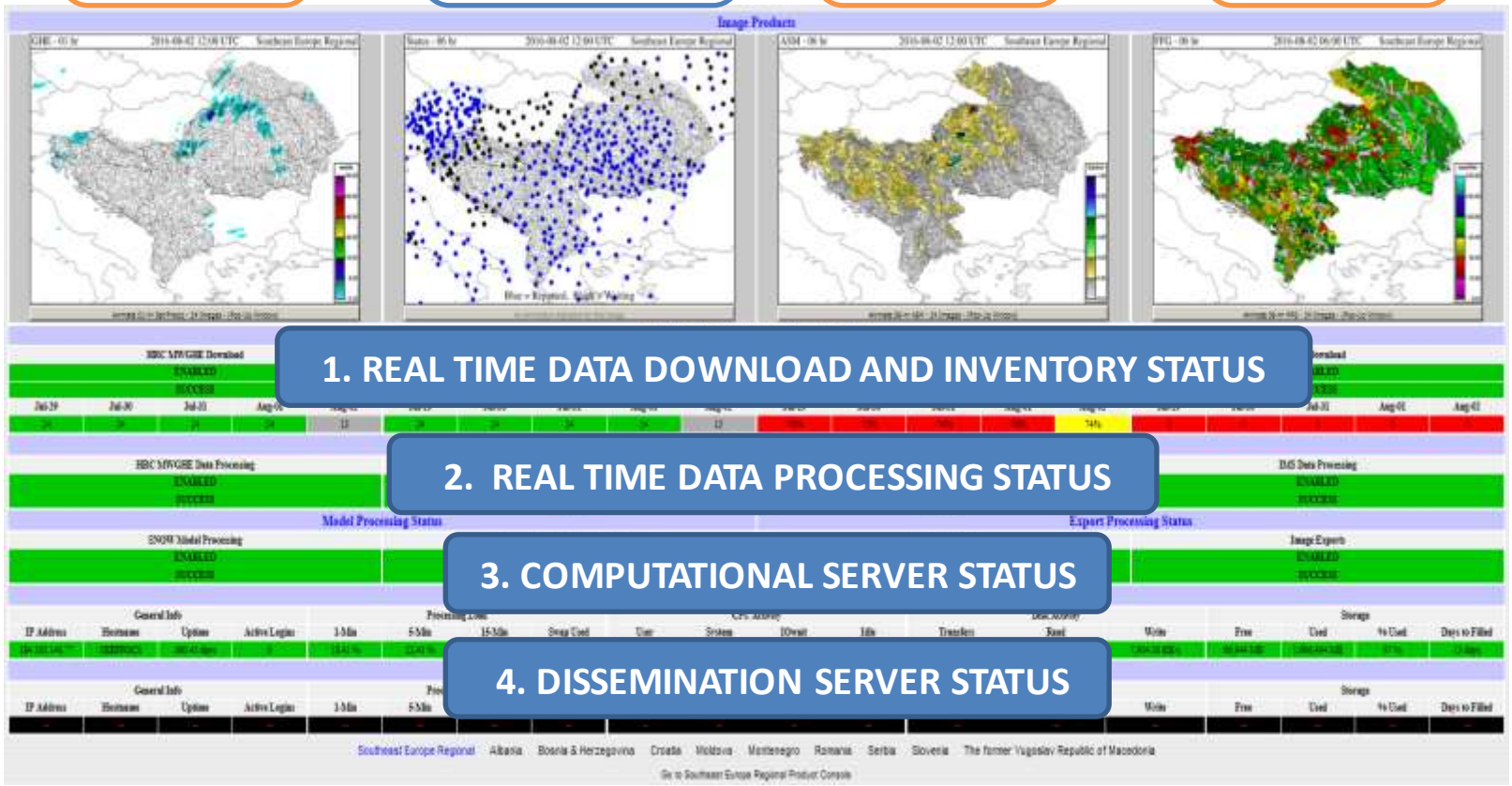
# FFGS Dashboard

**Global Hydro Estimator**

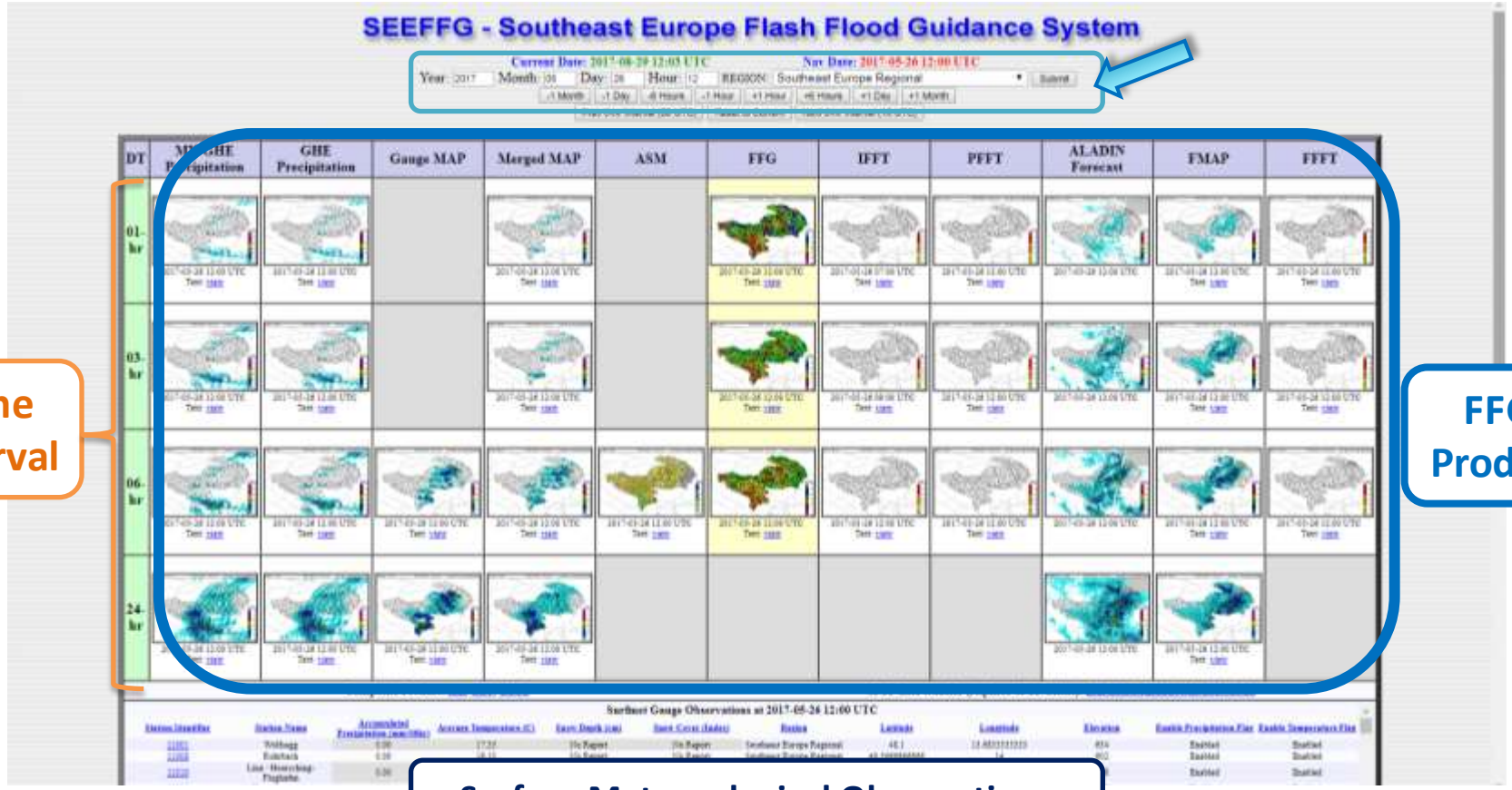
**Meteorological Stations Data Reception**

**Average Soil Moisture**

**Flash Flood Guidance**



# FFGS Interface

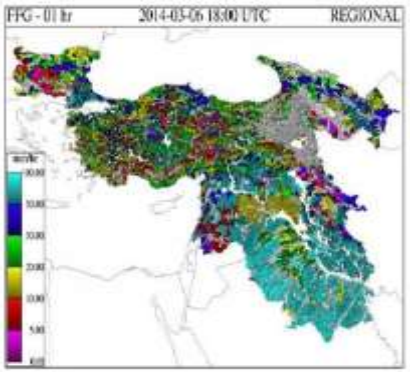



Time Interval

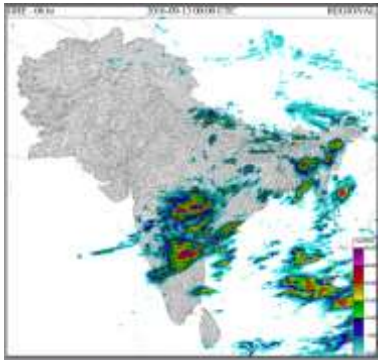
FFGS Products

Surface Meteorological Observations

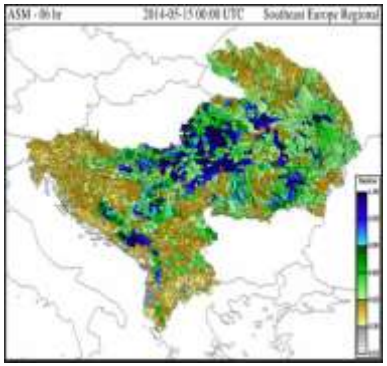
# FFGS Products



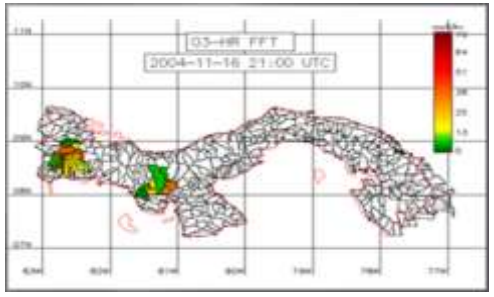

Flash Flood Guidance (FFG) for the BSMEFFG System



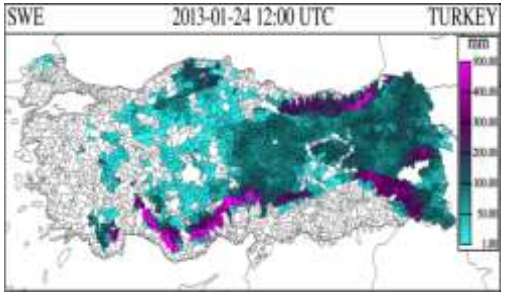
GHE Satellite precipitation for the SAsiaFFG System



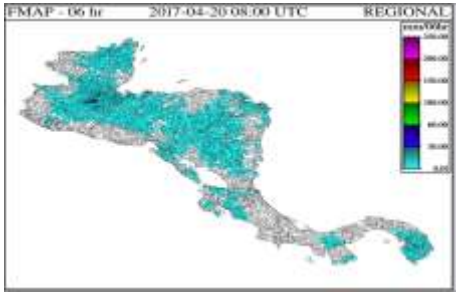

Average Soil Moisture (ASM) for the SEEFFG System




Flash Flood Threat (FFT) for the CAFFG System

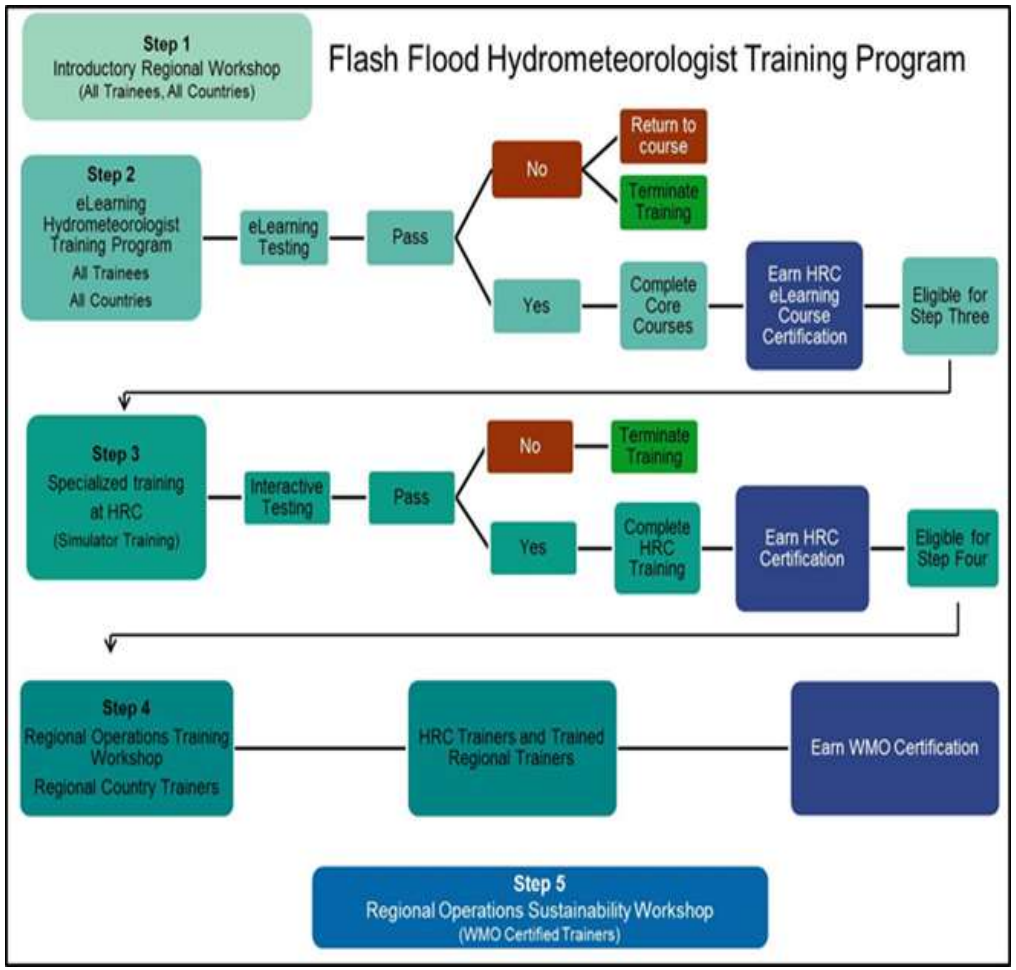



Snow Water Equivalent (SWE) for the Turkey




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;

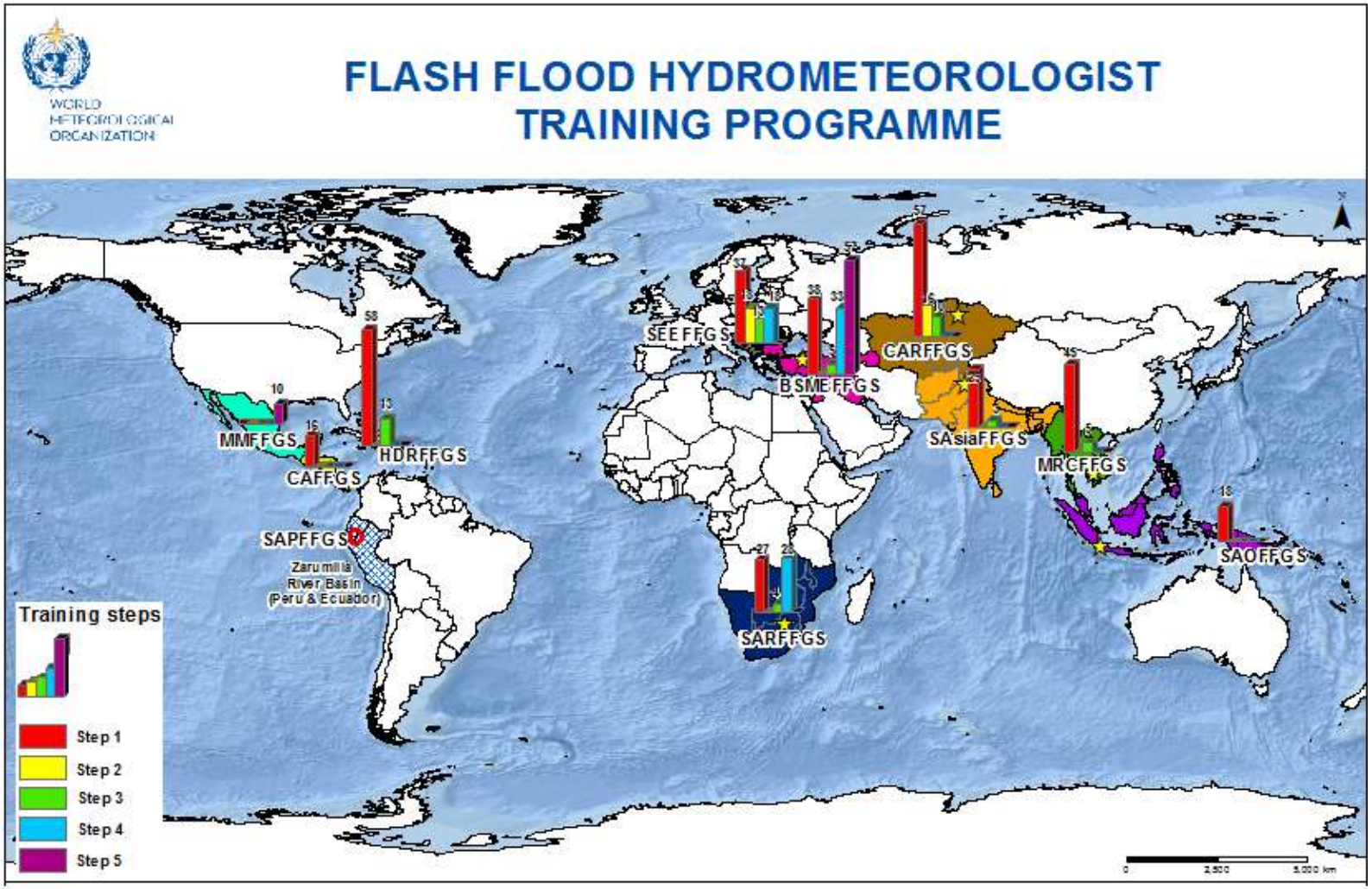
**Step-2:** On line eLearning comprises elements of meteorology, hydrology, flash flood guidance, GIS, and remote sensing;

**Step-3:** Advanced operations and interactive simulator training at the Hydrologic Research Center (HRC), USA;

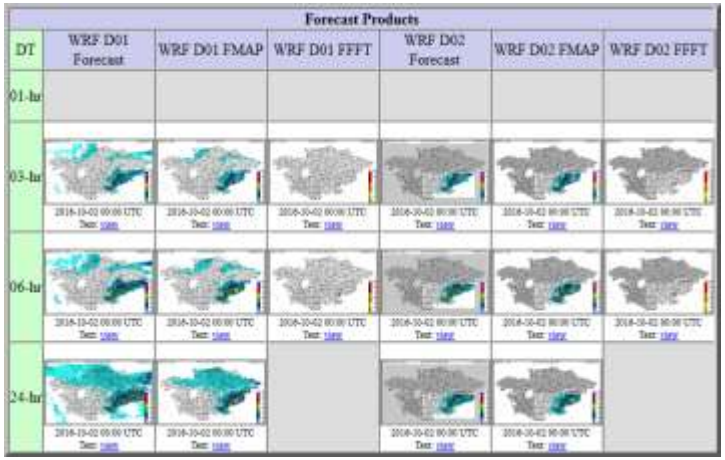
**Step-4:** Regional operations training workshop toward qualification of WMO flash flood trainer certificate;

**Step-5:** Regional operation sustainability workshop provided by the WMO certified trainer.

# Flash Flood Hydrometeorologist Training Programme – Training Statistics

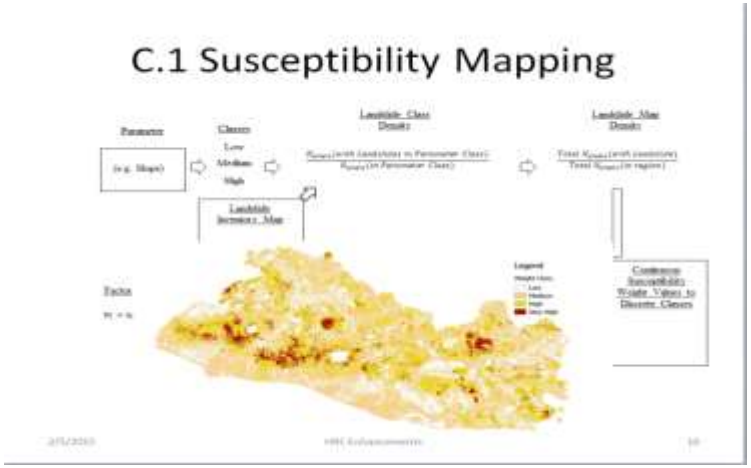


# Advances

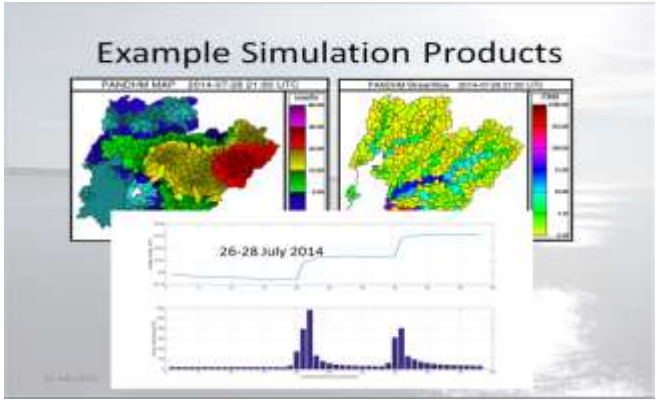



**Multi-NWP Model ingestion**


**Urban Flash Flood Early Warning System**

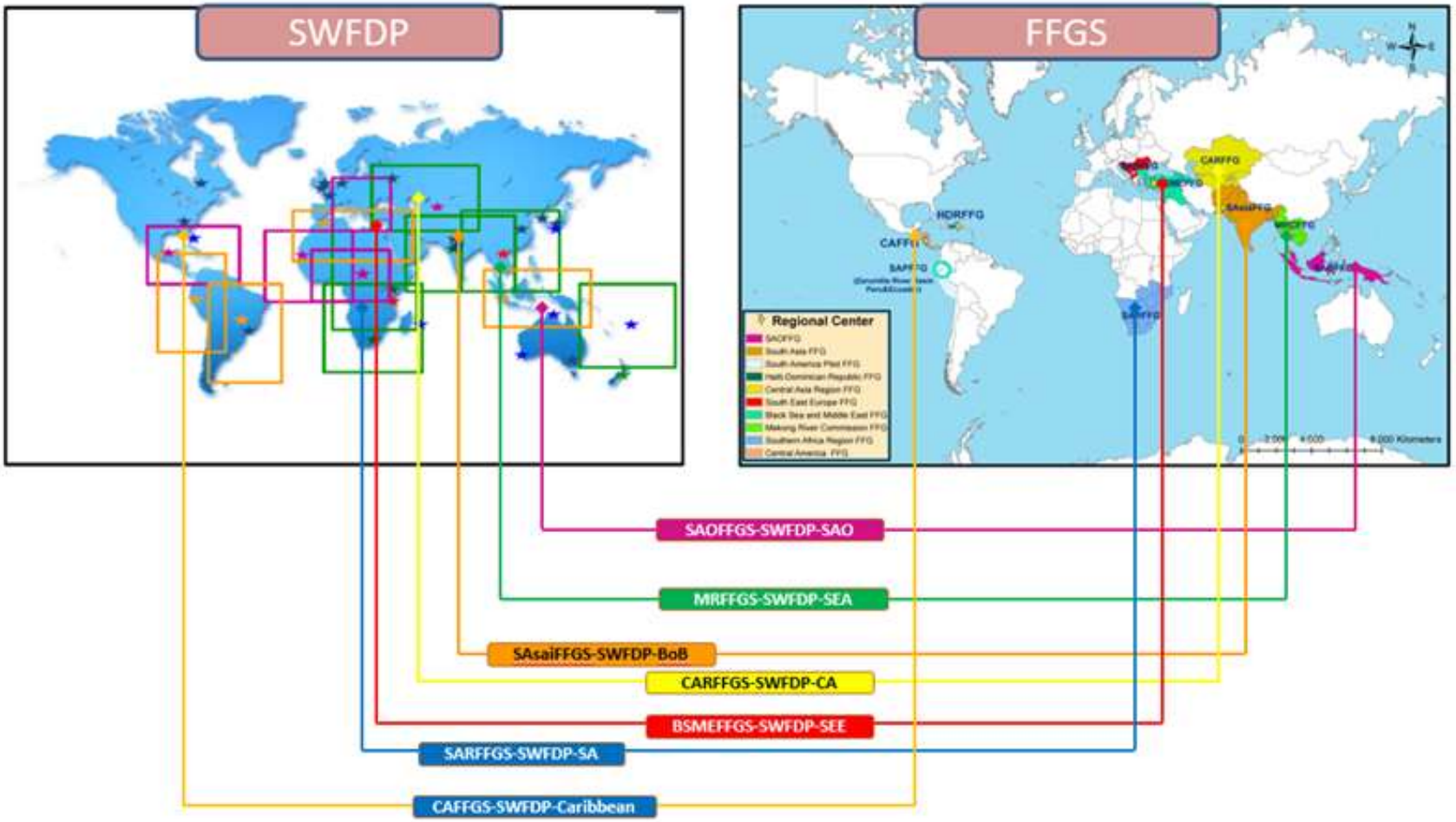



**Landslide Susceptibility Mapping**




**Expandable and Scalable Riverine Routing (Riverine Forecasting)**

# Linkages between SWFDP and FFGS Regional Systems



# Thank you

Paul Pilon
ppilon@wmo.int
Ayhan Sayin
asayin@wmo.int
Petra Mutic
pmutic@wmo.int

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| **For more information please visit:** | **http://www.wmo.int/ffgs** |
| | **http://www.hrcwater.org** |

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