Flash Flood Guidance System (FFGS) with Global coverage

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(Flash) Floods – The most frequent disaster in the world

“Recent findings (2018) of the United Nations International Strategy for Disaster Reduction survey indicated that in terms of occurrences, Floods (including flash floods), with 43.4%, and storms, 28.2%, are the two most frequently occurring disasters.
Flash Flood

Flood of short duration with a relatively high peak discharge in which the time interval between the observable causative event and the flood is less than six hours.
FFGS and Objectives

- FFGS is a forecaster’s tool designed to provide hydrometeorologists with readily and accessible observed and forecast data, and other information to produce **timely and accurate flash flood warnings**.

- Mitigate adverse impacts of hydrometeorological hazards;
- Enhance NMHSs capacity to issue flash flood warnings and alerts;
- Enhance collaborations between NMHSs and DMAs;
- Provide extensive training to the hydrometeorological forecasters;
Flash Floods and FFGS in Numbers

In an average year flash floods kill over **5,000** unsuspected people.

**FFGS serves almost 3 billion** people around the world saving lives and decreasing economic losses.

Flash floods occur quickly, within **6 hours** of the rain event.

**16 FFGS Projects**

**25 Hands-on FFGS trainings**

More than **400** Trained forecasters

**64 countries**

**61 WMO Certified FFGS Programme Trainers**

The Second Multi-Hazard Warning Conference (MHEWS-II)  
Early Warning and Early Action towards Sustainable and Inclusive Societies  
13-14 May 2019, Geneva, Switzerland
Technical Components of the FFGS

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FFGS Advances

The following enhancements are in various stages of development and implementation based on specific country needs, expressed interest, funding priorities and cooperation:

• Multi-model quantitative precipitation forecast (QPF) use within FFGS
• Radar Quantitative Precipitation Estimates (QPE)
• QPE from the New Generation of Satellites (spatial resolution of 1-2 km)
• Common Alerting Protocol
• Revamping 5 Step training programme
• Landslide susceptibility and landslide occurrence prediction
• Urban Flash Flood Early Warning System
• Riverine routing and discharge ensemble prediction
• Seasonal and sub-seasonal Ensemble Prediction (up to nine months)
FFGS Products

- Satellite QPE (IR) SARFFGS
- Satellite QPE (Microwave) SAOFFGS
- NWP model QPF Philippines
- Average Soil Moisture, CAFFGS
- Flash Flood Guidance PARFFGS
- Flash Flood Risk Philippines (up to 36 h)
FFGS Advanced Products

Riverine Routing Module

Urban Flash Flood Early Warning System

Streamflow Ensemble Forecast (up to 9 months)
Map Server – Regional View
Innovations -- Summary

• Institutional
  – Strengthening linkages between NMSs, NHSs and NDMAs
  – Increases regional and transboundary collaboration

• Training
  • Train-the-trainers ‡ Peer-to Peer Knowledge Transfer
  • Greater hands-on focus

• Technology
  • DEM, Land use, Soil Type, (Drainage networks)
  • Observing – rainfall ground stations, Satellite (rainfall, snow cover, SWE), radar
  • NWP high resolution forecasts
Merci
Thank you

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For more information please visit:
http://www.wmo.int/ffgs
http://www.hrcwater.org
Synergy with Severe Weather Forecasting Demonstration Project

- As flash floods are a hydrometeorological phenomenon, the FFGS makes use of Numerical Weather Prediction models which are used for modelling of potential flash floods. They act as crucial inputs for the FFGS in generating various products on the forecaster console.

- When a SWFDP and a FFGS project are geographically aligned, it has been observed that outputs generated from SWFDP’s weather forecast products proved useful as inputs to the FFGS.

- This is a clear demonstration of the synergy that exists between the FFGS and the SWFDP and the positive impact such synergy can have on the operations of the FFGS in these regions.

- Example: SeAFFGS (Regional Centre – HA Noi, VNMHA) and SFWDP-SeA (Regional Forecasting Support Center - RFSC Ha Noi)
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Radar Inclusion

- For better reliability and time/space specificity of flash flood occurrence forecasts/nowcasts.

- Radar precipitation estimates, when and where available, are used together with available local in-situ precipitation gauge data to obtain bias-corrected estimates of current rainfall volume over the region.
Urban Flash Flood Early Warning System

Today more than half of the earth’s population lives in cities and is projected to increase to two thirds by 2050.
Landslide susceptibility and landslide occurrence prediction

- Landslides on high slopes
- Rainfall induced landslides
- Landslide events caused by seismic activity or construction activities are excluded
Urban Flash Flood Early Warning System

Builds upon data available from FFGS (precipitation, model conditions) and includes high resolution modeling in urban area to include both surface and subsurface flow.
Map Server – National View

Zoom in/Zoom out possibility

Additional GIS layers

Basin statistics

Graphical Warnings

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