FLASH FLOOD GUIDANCE SYSTEM
HYDROMETEOROLOGIST TRAINING PROGRAM

Hydrologic Research Center, USA
Technical Developer

SAOFFFFG Steering Committee Meeting 1
10-12 July 2017
Jakarta, INDONESIA

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Flash Flood Hydrometeorologist Training Program

Step 1
Introductory Regional Workshop
(All Trainees, All Countries)

Step 2
eLearning Hydrometeorologist Training Program
All Trainees
All Countries

- eLearning Testing
  - Pass: Complete Core Courses
  - No: Return to course

- Earn HRC eLearning Course Certification
  - Eligible for Step Three

Step 3
Specialized training
at HRC
(Simulator Training)

- Interactive Testing
  - Pass: Complete HRC Training
  - No: Terminate Training

- Earn HRC Certification
  - Eligible for Step Four

Step 4
Regional Operations Training Workshop
Regional Country Trainers
HRC Trainers and Trained Regional Trainers

- Earn WMO Certification

Step 5
Regional Operations Sustainability Workshop
(WMO Certified Trainers)
Step one Introductory Regional In-Country Workshops
Done during implementation

- Re-introduction to the Regional Flash Flood Guidance System
- Introduction to models used and products produced in the FFG system.
- Discussion of data requirements still needed and verification of data
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Start:
- Introductory Regional Workshop
  - All Trainees, All Countries

Next:
- eLearning Hydrometeorologist Training Program
  - All Trainees, All Countries

Decision:
- Pass:
  - Complete Core Courses
  - Earn HRC eLearning Course Certification
  - Eligible for Step Three
- No:
  - Return to course
  - Terminate Training

Next:
- Interactive Testing

Decision:
- Pass:
  - Complete HRC Training
  - Earn HRC Certification
  - Eligible for Step Four
- No:
  - Terminate Training

Next:
- Regional Operations Training Workshop
  - Regional Country Trainers
  - HRC Trainers and Trained Regional Trainers
  - Earn WMO Certification

End:
- Regional Operations Sustainability Workshop
  - (WMO Certified Trainers)
Step two eLearning Hydrometeorologist Training Program

eLearning program to support system operations, product interpretation, system validation, including the use, management, and interpretation of output from the system, and the development of protocols to alert response agencies and the public of an impending or existing threat;

Five courses:
- Elements of Meteorology
- Elements of Hydrology
- Geographical Information Systems (GIS)
- Remote Sensing
- Flash Flood Guidance System products
Flash Flood Hydrometeorologist Training (FFHT) Program

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<th>HYDROLOGIC RESEARCH CENTER</th>
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- **USERNAME**
- **PASSWORD**

REGISTER NEW USER
VISIT THE HRC WEBSITE

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**Eight courses**
- Elements of Meteorology
- Elements of Hydrology
- Hydrometeorological Statistics
- Fluvial geomorphology
- GIS basics
- Flash Flood Guidance Model Products
- Remote sensing and Early warning systems

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<th>VIEW COURSES</th>
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<td>Filter Courses: Any Course</td>
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**MEKONG RIVER COMMISION MODULE**
- Courses
- Course Material
- Examination
- Actions

**ELEMENTS OF METEOROLOGY**
- Overview
- Add | View

**FLASH FLOOD GUIDANCE PRODUCTS**
- Courses
- Course Material
- Examination
- Actions

**FORUM TEST**
- Courses
- Course Material
- Examination
- Actions

**ELEMENTS OF HYDROLOGY**

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Hydrologic Research Center ~ Linking Science and Society
Flash Flood Hydrometeorologist Training Program

Step two eLearning Hydrometeorologist Training Program

Elements of Meteorology
Flash floods are events that are the result of heavy or excessive amounts of rainfall within a short period of time, usually less than 6 hours, causing water to rise and fall quite rapidly.

1. Factors necessary to produce heavy rainfall

2. Elements necessary for deep moist convection.


4. Examples of flash flood producing storms.

5. Meteorological processes that contribute to flash floods.
Step two eLearning Hydrometeorologist Training Program

Elements of Hydrology
Fundamental components of the hydrologic cycle, rainfall-runoff processes, evaporation, infiltration and groundwater flow, water budgets, introduction to surface and sub-surface hydrology, and flash flood modelling using simulation and spatial analysis tools.

1. Water cycle

2. Surface hydrology

3. Sub-surface hydrology

4. Flash floods – unique properties
Geographical Information Systems (GIS)
An introduction to GIS with a focus on the science applications of GIS systems, how data is generated, and how to use different software tools to map and analyze GIS data.
1. Description of GIS – introduction of concepts and application using Arcview/QGIS
2. Applied use of GIS – as related to flash flood
3. Manipulation of data for new or modifications of flash flood forecasting using GIS
4. Types of analysis available using GIS
5. Practical exercise
Remote Sensing
A introduction/overview of remote sensing methodology for data collection, analysis and the parameterization of environmental models relating to processes and models of the land surface.

1. Satellite representation of rainfall
2. Radar representation of rainfall
3. Land surface remote sensing
Step two eLearning Hydrometeorologist Training Program

Flash Flood Guidance System products
An overview of the application of flash flood guidance model products.

1. Description of flash flood guidance system - introduction of concepts and application

2. Types of analysis available using flash flood guidance model

3. Practical exercise using flash flood guidance model
Eight courses
Elements of Meteorology, Elements of Hydrology, Hydrometeorological Statistics, Fluvial geomorphology, GIS basics, Flash Flood Guidance Model Products, Remote sensing and Early warning systems.
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Regional Country Trainers

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Step 5
Regional Operations Sustainability Workshop
(WMO Certified Trainers)
Step three Specialized training at Hydrologic Research Center

Advanced Operations and Interactive Simulator Training at the Hydrologic Research Center focused on in-depth understand of System and operational application.
**Interactive Simulator**

Objective: To permit forecaster to run ‘What if’ experiments with respect to inputs and parameters.

- Utilizes historical events drawn from existing operational systems
- Assumes synoptic analysis had been performed (synoptic descriptions of events provided).
- Allows forecaster to make changes in input and/or parameters and gain understanding of the impacts of changes on FFG simulation and products, and *the impact on their decisions to issue flash flood warnings.*
Simulator Example

Simulator provides animations of time series of select FFG products over course of selected events.
Step four Regional Operations Training Workshop

HRC trainers in combination with Trained Regional - Trainers provide an in-country workshop at regional centers.

Three-day workshop covers:
(a) a brief discussion of the technical background and system development and,

(b) the operational use of the FFG System products through “hand-on” case studies; participants review and evaluate the FFG system products for selected events.
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Step five Regional Operations Sustainability Workshop

Step 5 workshops are led by WMO certified trainers, and act as refresher training in operational use, data requirements (an overview), system verification and user validation.

Three-day workshop covers:
(a) a brief discussion of the technical background and system development and,

(b) the operational use of the FFG System products through “hand-on” case studies, where workshop participants reviewed and evaluated the FFG system products for selected events.
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 for individual development, but 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 citizenship.

Pakistan, Thailand, Flash 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 is to aid in rebuilding communities. DRR education programs for systemic approach to identify mitigating the hazards associated with natural disasters. If we focus on floods, in particular, an education program the important characteristics of associated with these natural disasters and with the potential of a medium to two feet of flood can allow the learner to pose fundamental questions pertinent to the situation. This practical approach to understand the role and are gain knowledge and participate in our way to create awareness with individuals, but it is by the knowledge the learner tackles and other natural disasters reduce the risks, empower the community to mitigate and act strategically.

The following article provides two programs that involve individual countries.

Students in the Philippines present their school Hazard Map to teachers and suggest some mitigating or preventative measures based on what they have learned.

Philippines: Disaster Risk Reduction through Red Cross Youth Movement (DRRMYC)

Youth are taught on how to conduct Hazard, Vulnerability, and Capacity Assessment for their schools and communities.

Education is not only for the students: every year secondary teachers do their Training on Basic Life Support and Survival Swimming.

Tricia May Phongs, Red Cross Youth (RCY) president, speaks on behalf of the youth from the Philippines. She shares her experiences being a Disaster Risk Reduction (DRR) advocate in local schools and emphasizes the role of children in disaster risk reduction.