

## FLASH FLOOD GUIDANCE GAZETTE

Flash Flood Guidance (FFG) Gazette, a bi-annual newsletter bringing users of FFG products all the latest news – operational information, technical advances, case studies and soon introducing the new e-learning environment for the flash flood community.

### Hydrologic Research Center ~ Linking Science and Society

#### COMMUNITY INVOLVEMENT IN FLASH FLOOD GUIDANCE

The Observatory of the Ministry of the Environment and Natural Resources (MARN, in Spanish) of El Salvador has recognized the need to provide timely and accurate warnings to communities at risk of flash floods and has blended the advancements in technology and science with local information and data to communicate this risk to their population. El Salvador has done this through a multi-pronged approach. This has included strengthening its atmospheric monitoring system for flash floods and flooding through the acquisition of six X-band radars, the procurement of 90 real-time weather stations and an extensive network of trained weather volunteer observers, many of whom live in the communities at risk. This additional monitoring network complements the enhanced Central America Flash Flood Guidance (CAFFG) system and contributes to improving the flash flood warnings issued by MARN.

While the data from radars and the real-time weather stations are invaluable, there are still many limitations with regard to both the location of thunderstorms and precipitation amounts that trigger flash floods. Consequently, MARN established a network of in-situ trained volunteer weather spotters (600 approximately) throughout the country as an essential component of the Early Warning System (EWS) for hydrometeorological hazards in El Salvador, including flash floods. The training was under the auspices of the National Program for Risk Reduction in El Salvador and in collaboration with a variety of Non-Governmental Organizations (NGOs). MARN conducted training workshops for the community-based weather spotters. Their training includes learning about threats, risk reduction, vulnerability in their communities and the communication system used to broadcast reports. The training consists of both hands-on practices and working groups and makes the weather spotters aware of the importance of their re-

ports when the situation requires, regardless of the day or hour. As a result of this training, weather observers receive a certificate that certifies them as “official” local weather spotters for the MARN monitoring network.

The local observers transmit their reports by radio directly to MARN - where trained personnel are available 24 hours a day, 7 days a week, in order to issue flash flood warnings at any time. As hydrologists and meteorologists from MARN are evaluating threat situations continuously, the information provided by weather spotters assists them with the most current local precipitation conditions. In this way, hydrologists and meteorologists from MARN can make last minute decisions based on the valuable data provided by CAFFG, radars and automatic weather stations and the timely information provided by their in-situ community weather observers. It is expected that this addition of trained community weather observers in El Salvador will assist in improving the local information for heavy rain events and ultimately benefit the people of El Salvador threatened by flash floods.

- contributing author Rosario Alfaro NOAA Affiliate

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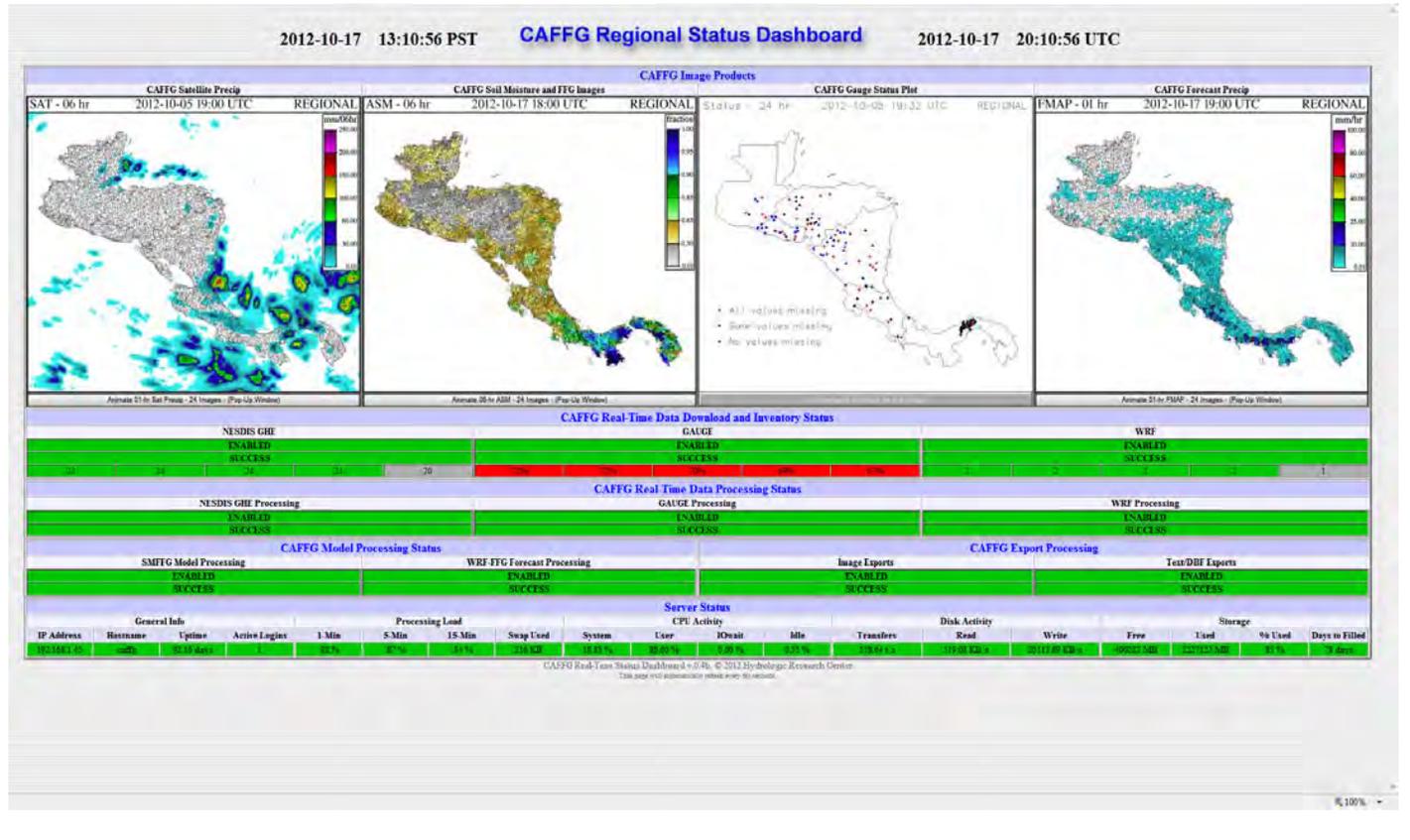
## FLASH FLOOD GUIDANCE SYSTEM UPDATES

HRC Staff implemented the first FFGS “dashboard” interface – a new web page that will serve as the primary “landing spot” for end-user connections to the FFG Regional servers. The dashboard strives to provide a one-screen summary of the most vital operational products and information at a glance. Using display real estate that is optimized for Full HD resolution (intended for display on a large-screen TV for broad visibility in an operational center), selected image products, configuration and processing status indicators along with the vitals of the regional server itself are all available in one view for all relevant parties to determine quickly if further inspection or action is needed. Forecasters can review the primary image products, gauge station reporting status plot, indicators of real-time data availability and various processing status indicators confirming the success (or failure) of all primary processing modules of the FFG system. Especially for IT staff, additional status

information about the server itself is provided; most significantly, the amount of storage space remaining and various aspects of the server’s hardware processing load. As an additional feature, the prototype also provides capability for users viewing the interface through their PC browser to animate the dashboard’s image products in pop-up windows with controls for animation speed, start, stop and manual stepping. This dashboard will become the default interface for all incoming user connections but will also provide links to the traditional forecaster product console with the familiar features to download data files, review logs and facilitate the variety of interactive activities that the new dashboard interface does not intend to provide.

Examples of the new products mentioned are shown below.

- contributing author Jason Sperflage HRC



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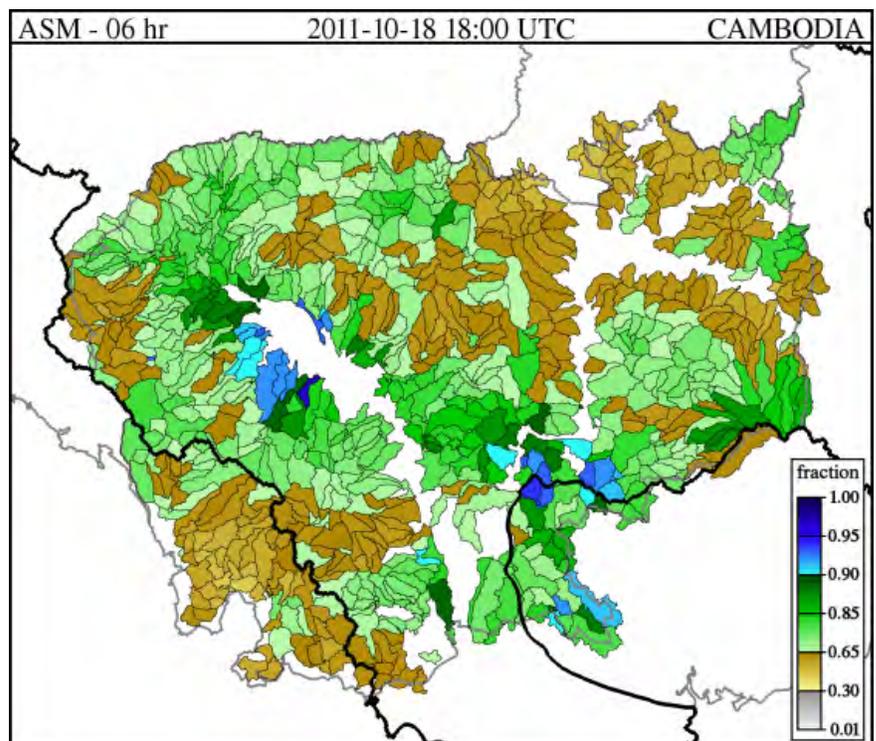
## NASA Earth Science Applications, Disasters



Responding to a request for proposals, in 2012 HRC was selected to receive a Grant Award from the NASA Earth Science Applications, Disasters.

**The scope of the Grant is for HRC to examine the feasibility and effectiveness of the use of a series of satellite land-surface products in operational forecasting.**

The example in the panel above shows the water inundation as seen by MODIS satellites in Cambodia. This may be compared to the real-time estimated upper soil water content from the operational MRCFFG (Mekong River Commission Flash Flood Guidance System) (right panel). Use of the satellite information is expected to correct the system soil water product, which is shown in the example to be drying in some of the inundated areas.



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## Training Programs and Workshops

### SOUTH ASIA FLASH FLOOD GUIDANCE WORKSHOP



Dr. Konstantine Georgakakos and Robert Jubach attended the Planning Meeting on the Establishment of a Flash Flood Guidance System (FFGS) for South Asia in Kathmandu, Nepal from 26-28 November 2012. The meeting was hosted by the International Centre for Integrated Mountain Development (ICIMOD) and organized jointly by ICIMOD and the World Meteorological Organization. The purpose of the meeting was to discuss the FFGS project with the stakeholders and agree on ways for program development. Kosta and Bob provided presentations discussing the fundamentals of the FFGS including the flash flood guidance approach for developing flash flood warnings, its operations concepts and implementation in the region.

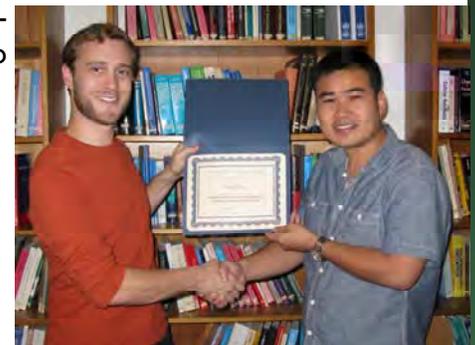
### VISIT TO THE SULTANATE OF OMAN

Dr. Wolfgang Grabs of WMO and Dr. Konstantine Georgakakos of HRC visited the Directorate General of Meteorology and Air Navigation within the Public Authority for Civil Aviation of the Sultanate of Oman during the period 25-26 September 2012 and participated in presentations, technical discussions and a field excursion pertaining to the possible implementation of the flash flood guidance system for the country.



### MEKONG RIVER COMMISSION FLASH FLOOD GUIDANCE TRAINING

The Hydrologic Research Center (HRC) conducted System Administration Training on the Mekong River Commission Flash Flood Guidance (MRCFFG) System for Boly Chen of the Regional Flood Management and Mitigation Center (RFMMC) (October 22 to 26, 2012).



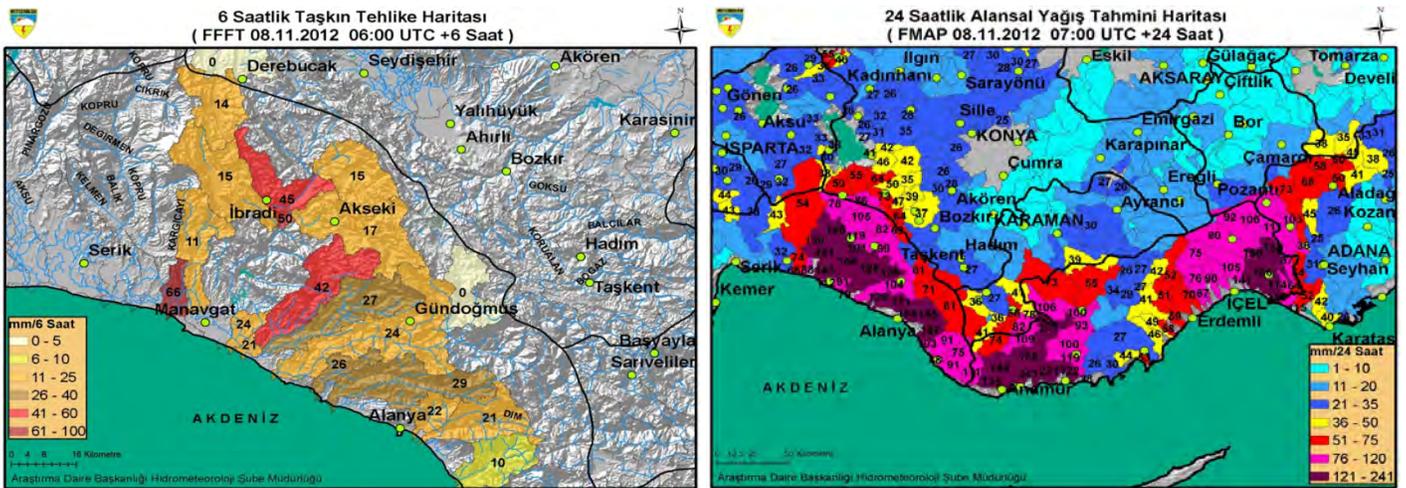
In addition HRC provided advanced MRCFFG system operations training of the MRCFFG System to Pichaid Varoonchotikul of the Regional Flood Management and Mitigation Center (RFMMC) and Long Vu Duc of the Vietnam National Centre for Hydro-Meteorological Forecasting (October 22 to November 16, 2012). All training was done at HRC headquarters in San Diego, CA.

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## BLACK SEA AND MIDDLE EAST FLASH FLOOD GUIDANCE

On the 7th November 2012, severe rainfall occurred in the provinces of Antalya, Muğla, Denizli and Mersin in Turkey.

Significant damage was caused when a number of rivers flooded their banks, and caused various problems for locals in the towns. An analysis of the storm by the Turkish Meteorological Service showed that the Black Sea Middle East Flash Flood Guidance (BSMEFFG) system performed very well—indicating the areas of heavy rainfall (FFG) (left figure) and forecast mean areal precipitation (FMAP)(right figure) that were in agreement with the observed data. Therefore flash flood warnings were issued for the affected provinces and towns.



In the above images forecasters using the BSME system have overlaid the basins in the BSMEFFG system onto maps for dissemination in Flash Flood Bulletins.



Information and photographs courtesy of the Turkish Meteorological Service, Republic of Turkey  
Ministry of Forestry and Water Works, Ayhan Sayin.

We would like to ask you to share your suggestions, stories, pictures, experiences relating to flash floods and flash flood guidance systems. Please send your information to R. Graham (editor) at [rgraham@hrc-lab.org](mailto:rgraham@hrc-lab.org)