

Mekong River Commission

MRC Flash Flood Guidance System (MRCFFGS)

Performance of MRC Flash Flood Guidance System during flood season 2016



Flash flooding in Oudomxay province has made road travel difficult.



A bridge in Thailand hit by Tropical Storm Dianmu.

—Photo The Nation

29 November 2016

**MRC/OSP
Phnom Penh**

Content

- Background Information on establishment of the MRC Flash Flood Guidance System.
- MRC Flash Flood Guidance System in Operational form.
- MRC FFGS daily operation during flood season 2016.
- Lesson learned from daily operations of MRC FFGS during flood season 2016.
- Conclusions and Recommendations.

Background information on FFG system

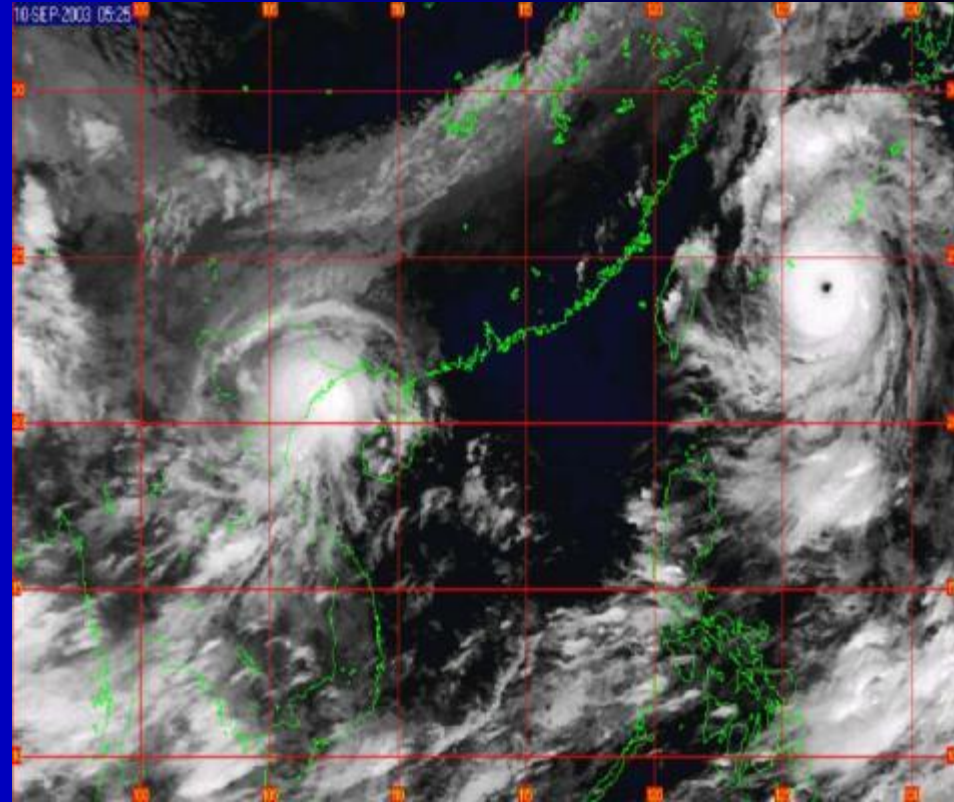
MRCFFS Development Partners

- Flash Flood Guidance System Implementation in MRC member countries (Cambodia, Lao PDR, Thailand and Viet Nam) through funding from USAID Office of U.S. Foreign Disaster Assistance (OFDA).
 - Asia Flood Network - Program for Flood Mitigation in Asia.
 - Hydrologic Research Center (HRC) was technical partner and implementing organization.
 - Other: U.S. National Oceanic and Atmospheric Administration (NOAA).



Hydrometeorological Hazards of the Mekong Region

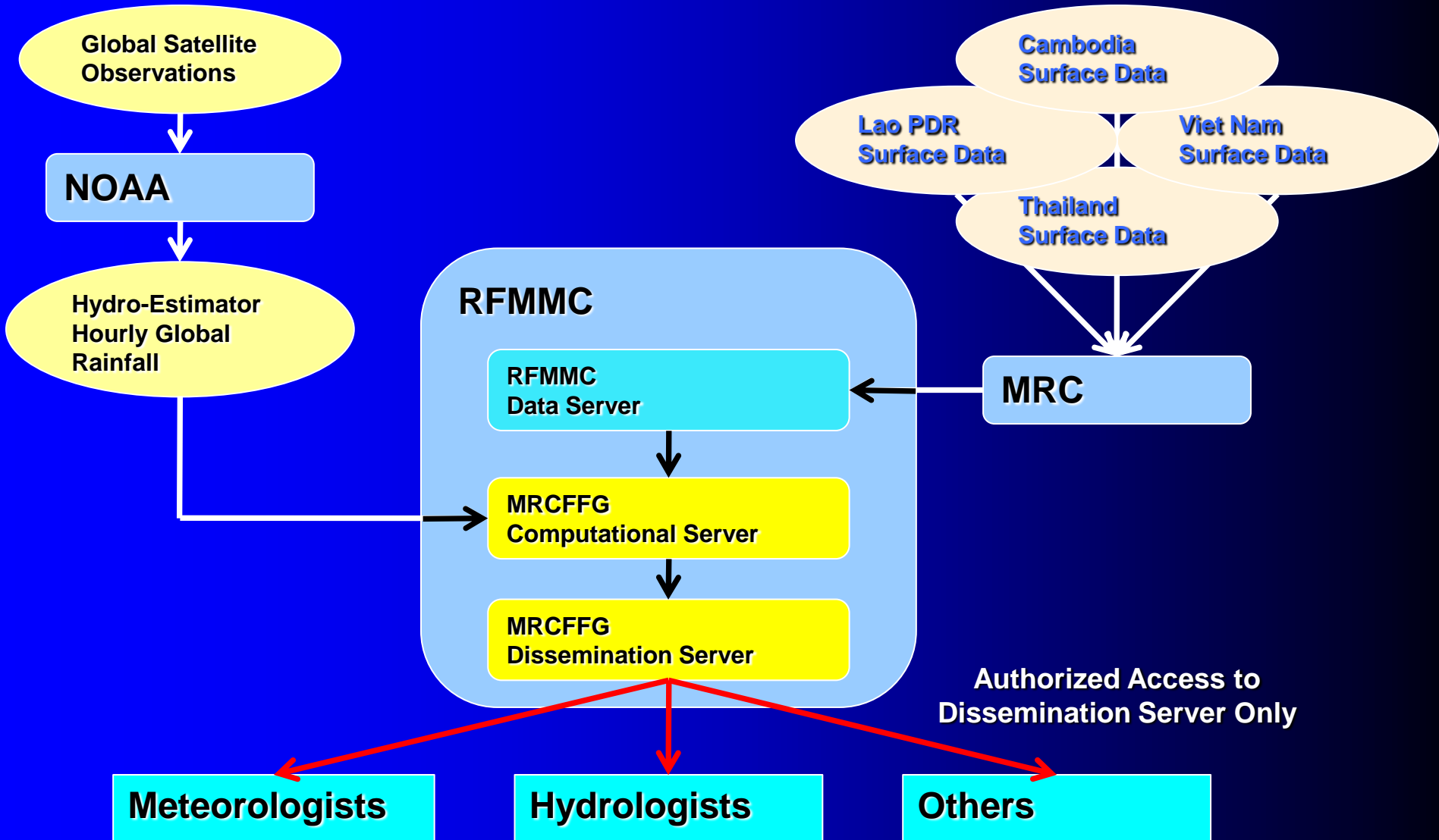
- Mekong region has a *tropical monsoon climate* with abundant rainfall.
- One of most *disaster-prone region* in the world – suffering from many kinds of natural disasters.
 - Typhoons
 - Flash floods
 - River floods
 - Landslides



Flash floods from typhoons are an annual occurrence and can cause major damage and loss of life

MRCFFG Regional Flash Flood Guidance System

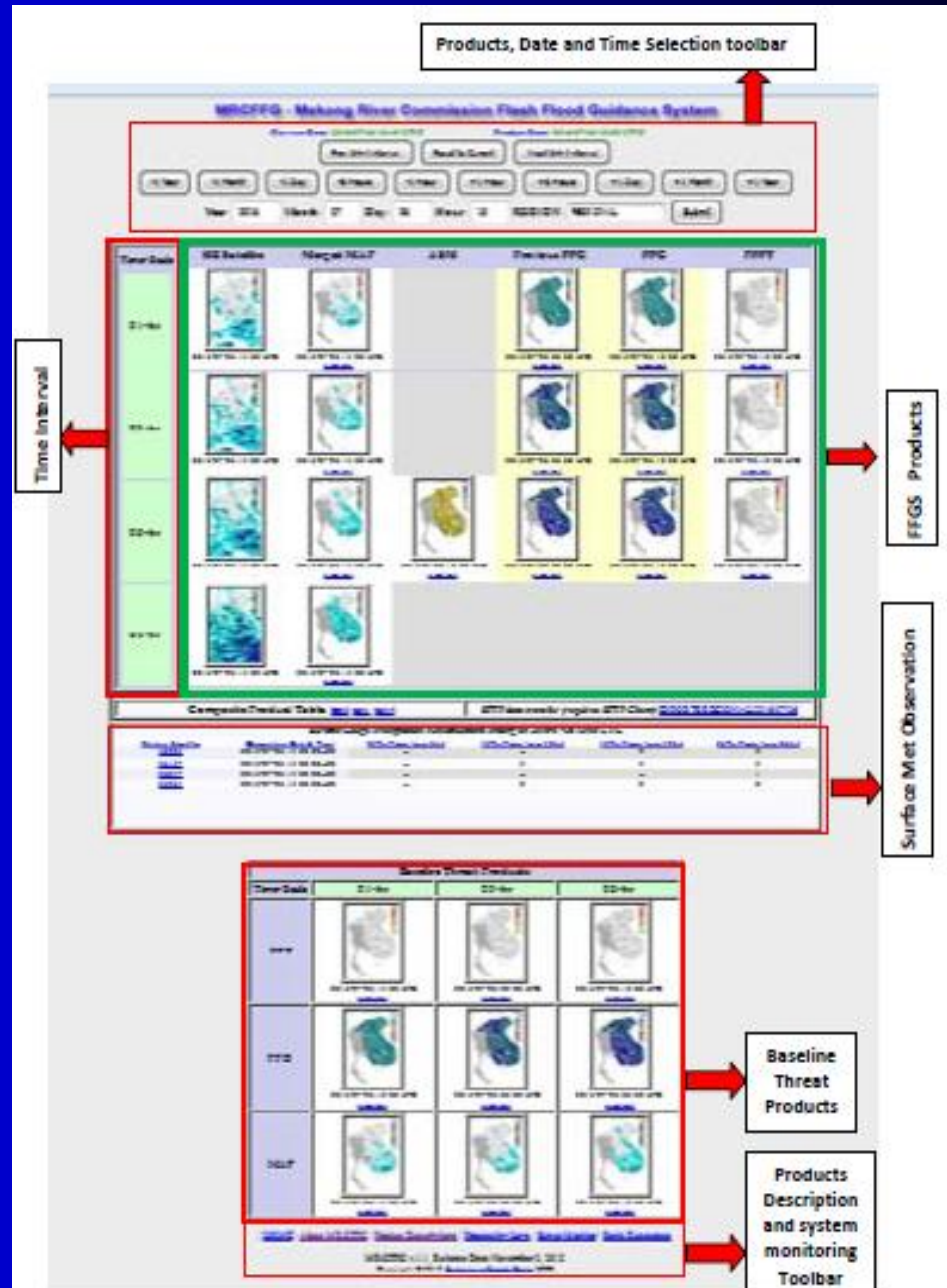
Structure of MRC FFG System



MRCFFG Regional Flash Flood Guidance System

Forecast interface

- Designed for *quick access and easy navigation* to regional and country products
- Provides *one access point for meteorological and hydrologic data* needed to make decisions for flash flood warnings
- Can navigate *to earlier products*
- Design developed with *input from regional center and countries.*
- *FFG product updated every 6 hours at 00:00,06:00,12:00,18:00 UTC*
- /



Concept of Daily MRC FFG Operation

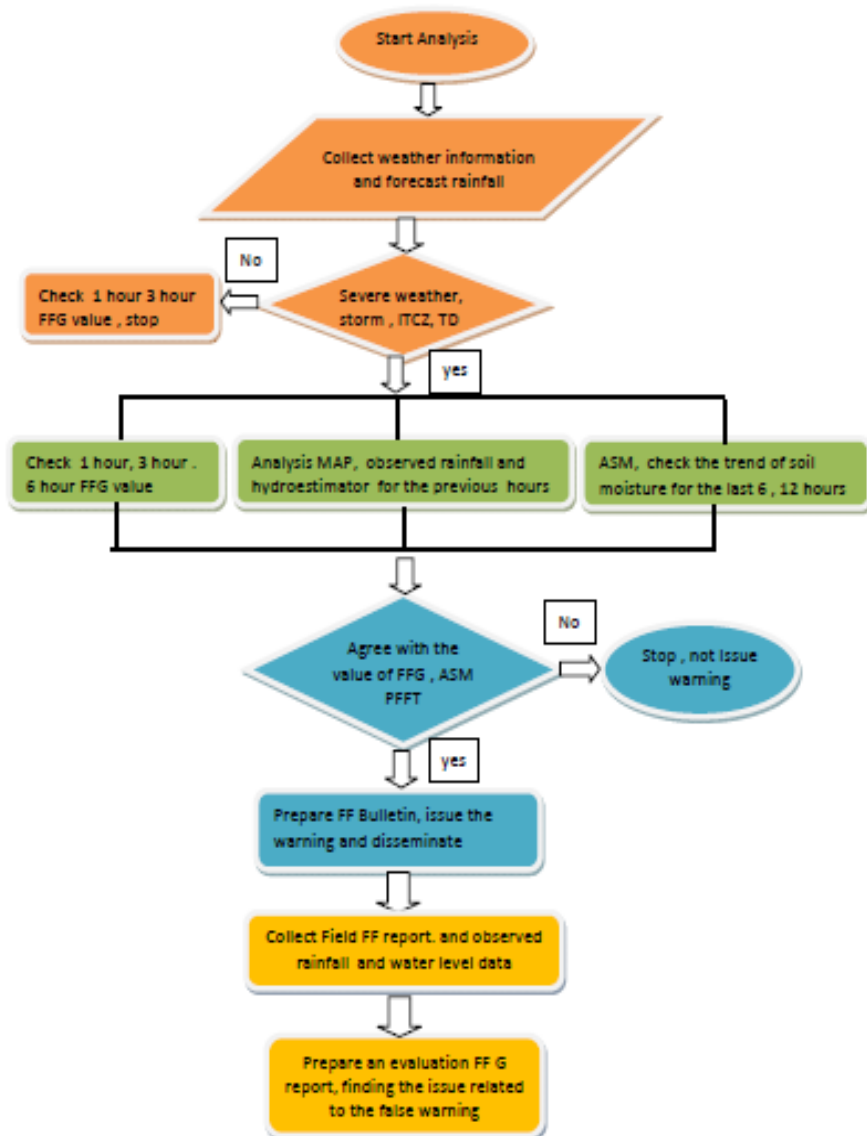
Implement an end-to-end flash flood warning system to *improve responses* by governments, local governments, international organizations, NGOs, private sector, and public to occurrences of flash floods.





FFG Product access : <https://ffg.mrcmekong.org/MRCFFG>

User name: mrc ; password : mrcffg-2009



Daily Operation of The MRC FFG System



Color indicated in the work flow	Time frame for the process the work	Work activities
	From 7:00 to 7:30 for morning operation From 13:00 to 13:30 For afternoon operation	Collect weather information from web site : www.tmd.go.th ; www.tropicalstormrisk.com ; www.Sharaku.erorc.java.jp/GSMap/ and forecast rainfall from NOAA, and do analysis weather situation.
	From 7:30 to 8:10 for morning operation From 13:30 to 14:10 for afternoon operation.	Process 1;3;6 hour FFG according to the guideline for processing FFG system. Calculate the accumulated rainfall for the observed (surface) rainfall which are available in hydmet database, and compare with the accumulated MAP and accumulated hydroestimator.
	From 8:10 to 8:30 for morning operation. From 14:10 to 14:30 for afternoon operation	Prepare the Flash flood warning text in word format and also table of the warning districts or villages in excel format, send it to the IT staff of RFMMC to upload to web site .
	Within week after the issue the FF warning . The evaluation report should be keep for review and add the additional information or data received from the NLA at the end of flood season	Contact to the national line agencies or the national FFG operator to request the flash flood information or also collect flash flood information from the online newspaper , Prepare the FFG evaluation report according to the guideline of FFG evaluation report.

Daily Operation of MRCFFG

Flash Flood Guidance Product at the MRC website



The screenshot displays the MRC Flash Flood Guidance System (MRCFFGS) interface. It features a header with 'Mekong River Commission' and navigation links. Below is a 'Flood Forecasting' section with a menu: Overview, Upper Mekong, Central Mekong, Lower Mekong, Tabular data, New features, Map Centre, Partners, Water Level Data, Rainfall data, About this site, Flash Flood Products, Weather Information, Historical Data / Reports, and Links. The main content area is titled 'Some Products of the MRC Flash Flood Guidance System (MRCFFGS) On 24 July 2012 at 00:00 UTC (07:00 Local time)'. It contains six maps and their corresponding captions:

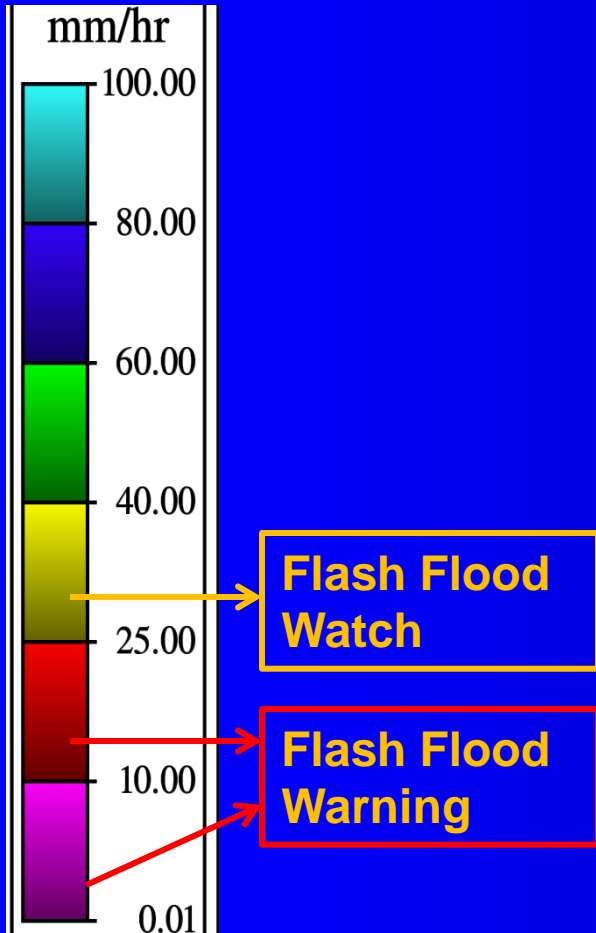
- Figure 1:** 1 Hourly Flash Flood Guidance (FFG) on 24 July 2012 at 00:00 UTC (07:00 local time). Shows high risk areas in central and northern parts of Viet Nam and northern parts of Lao PDR.
- Figure 2:** 3 Hourly Flash Flood Guidance (FFG) on 24 July 2012 at 00:00 UTC (07:00 local time). Shows high risk areas in central and northern parts of Viet Nam and northern parts of Lao PDR.
- Figure 3:** 6 Hourly Flash Flood Guidance (FFG) on 24 July 2012 at 00:00 UTC (07:00 local time). Shows high risk areas in central and northern parts of Viet Nam and northern parts of Lao PDR.
- Figure 4:** 6 Hourly Average Soil Moisture (ASM) condition (00:00 UTC to 06:00 UTC) on 24 July 2012. Shows soil moisture in some areas in central and northern parts of Viet Nam and northern parts of Lao PDR.
- Figure 5:** 24-hourly Mean Areal Precipitation (MAP) from 00:00 UTC on 23 July to 00:00 UTC on 24 July 2012. Shows heavy rain in some areas in central and northern parts of Viet Nam and northern parts of Lao PDR.
- Figure 6:** 1 Hourly Mean Areal Precipitation (MAP) from 00:00 UTC to 01:00 UTC on 24 July 2012. Shows rain in some areas in northern part of Viet Nam and some areas in northern part of Thailand.

Each map includes a legend for 'Regional (mm/hour)' and 'National (mm/hour)'. A note at the bottom states: 'Note: Mean Areal Precipitation (MAP) is updated hourly. Average Soil Moisture (ASM) is updated every 6 hours. Flash Flood Guidance (FFG) is updated every 6 hours. For any query please contact: floodforecast@mrcmekong.org'.

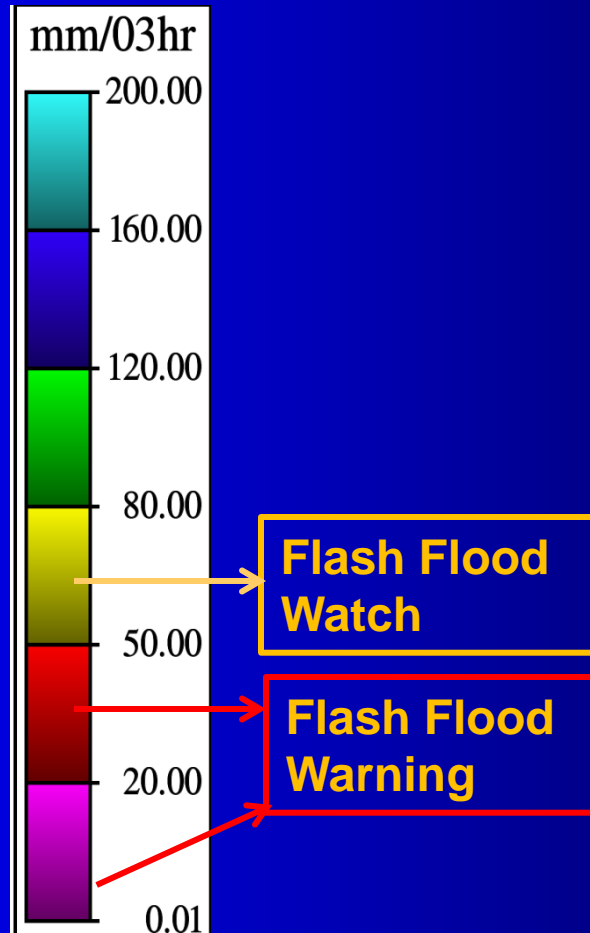
In order to contribute to better preparedness and reduction of life losses and damages due to flash floods for flash flood vulnerable communities in LMB. The RFMMC has initiated the MRCFFGS operations and carry out testing at beginning of flood season 2010. Since August 2010 a number of FFGS products have been processed and published twice-daily, at 08:30 and 14:30 (during the heavy weather condition) on the “Flood Pages ”of MRC website.

FFG Scale

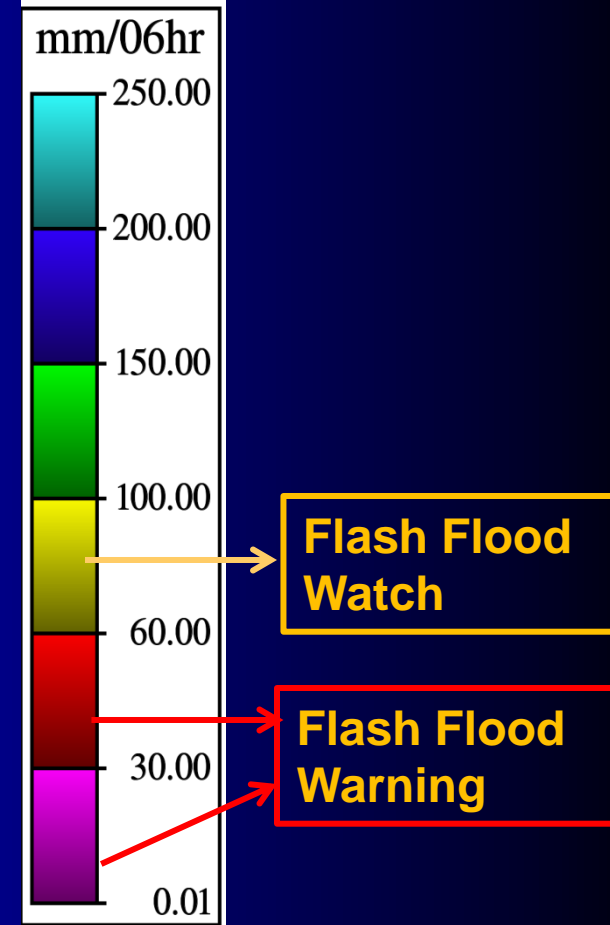
1 hour FFG scale



3 hour FFG scale



6 hour FFG scale



The FFG value indicates the total volume of rainfall over the given duration which is just enough to cause bank full flow in the draining stream outlet. Consequently, rainfall volumes of the same duration that are greater than the FFG value indicate a likelihood of overbank flows at the draining stream outlet.

Information on flash flood risk areas provided by MRCFFG system on MRC flood forecast Pages

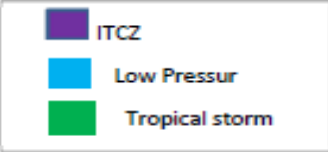
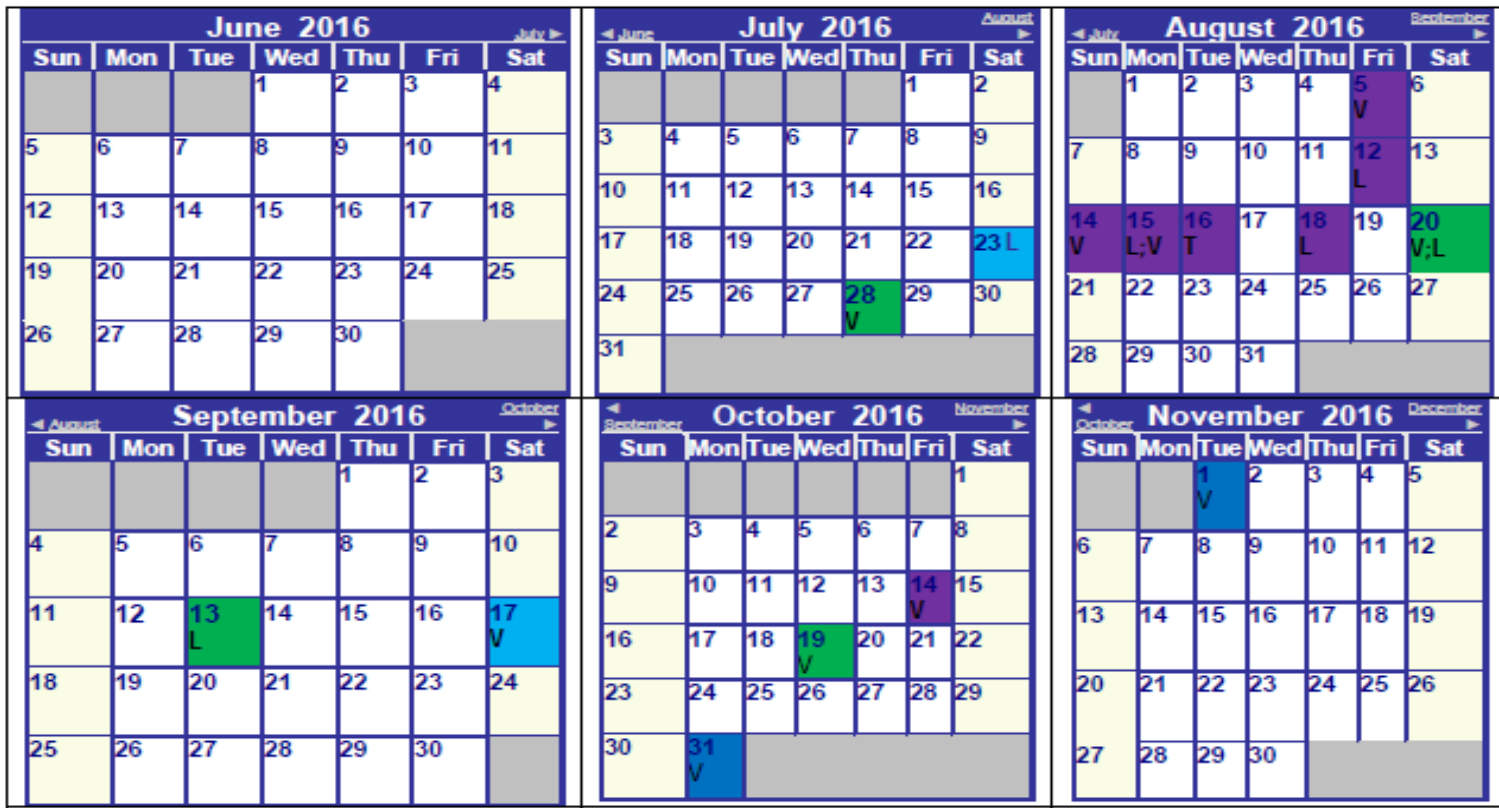
Date of FFG products 12/08/2016 00:00 UTC time			Date of FFG products 12/08/2016 00:00 UTC time		
1hour Flash Flood Guidance in Vietnam			3hours Flash Flood Guidance in Vietnam		
Provinces	Districts	FFG value	Provinces	Districts	FFG Value
Lao Cai	Bat Xat	17.30	Ha Giang	Yen Minh	45.47
Lao Cai	Sa Pa	17.81	Ha Giang	Bac Me	45.47
Lao Cai	Than Uyen	18.01	Ha Giang	Hoang Su Phi	42.32
Lai Chau	Phong Tho	17.65	Ha Giang	Vi Xuyen	43.36
			Ha Giang	Xin Man	39.98
			Ha Giang	Bac Quang	42.89
			Cao Bang	Bao Lac	45.47
			Lao Cai	TX. Lao Cai	36.53
			Lao Cai	Muong Khuong	46.44
			Lao Cai	Bat Xat	25.83
			Lao Cai	Bac Ha	41.34
			Lao Cai	Bao Thang	46.44
			Lao Cai	Sa Pa	26.50
			Lao Cai	Bao Yen	43.24
			Lao Cai	Than Uyen	23.60
			Lai Chau	Muong Te	42.33
			Lai Chau	Phong Tho	28.24
			Lai Chau	Sin Ho	41.12
			Lai Chau	Muong Lay	42.61

Date of FFG products 12/08/2016 00:00 UTC time				Date of FFG products 12/08/2016 00:00 UTC time			
1hour Flash Flood Guidance in Lao				3hour Flash Flood Guidance in Lao			
Provinces	Districts	Villages	FFG Value	Provinces	Districts	Villages	FFG Value
Phongsaly	Phongsaly	LAOTHE NE	20.88	Phongsaly	Phongsaly	LAOTHE NE	28.75
Phongsaly	Phongsaly	LAOSE	20.88	Phongsaly	Phongsaly	LAOSE	28.75
Phongsaly	Phongsaly	TASENPHONG	20.88	Phongsaly	Phongsaly	TASENPHONG	28.75
Phongsaly	Nhot ou	TAKOUXANG	21.73	Phongsaly	May	HOUAYSONG T	39.41
Phongsaly	Nhot ou	PACHE OLIN	21.73	Phongsaly	May	HOUAYSONG N	39.41
Phongsaly	Nhot ou	PE ULAOXOU K	21.73	Phongsaly	May	HOUAYVIK NEU	39.41
Phongsaly	Nhot ou	LAO PHOU CHA	21.73	Phongsaly	May	HOUAYVIK TAI	39.41
Phongsaly	Nhot ou	PE ULAOXOU M	21.73	Phongsaly	May	NAMNGA	39.41
Vientiane	Vangvieng	NAMON TAI	24.87	Phongsaly	May	NAMKHAM	39.41
Vientiane	Vangvieng	NAMON NEUA	24.87	Phongsaly	May	OM KAENG	39.41
Vientiane	Vangvieng	PHONESAWAN	24.87	Phongsaly	May	HOUAYVANGS	39.41
Vientiane	Vangvieng	VANGHEUA	24.87	Phongsaly	May	HOUAY OUN	39.41
Vientiane	Vangvieng	PHONEKEO	24.87	Phongsaly	May	PONGHY	39.41
Vientiane	Vangvieng	NA OM	24.87	Phongsaly	May	TINTOK	39.41
Vientiane	Vangvieng	NANGEUN NEU	24.87	Phongsaly	May	OM PALONG	39.41
Vientiane	Vangvieng	PHONEYANG	24.87	Phongsaly	May	PONGHY	39.41
Vientiane	Vangvieng	NANGEUN TAI	24.87	Phongsaly	May	TANLOTTONG	39.41
Vientiane	Vangvieng	NAMPAT NEUA	24.87	Phongsaly	May	HOUAYVANGK	39.41
Xaysomboun Sp	Longxan	NAMYING	23.94	Phongsaly	May	NANG UN	39.41
Xaysomboun Sp	Longxan	XENGM	23.94	Phongsaly	May	POUNGKHAO	39.41
Xaysomboun Sp	Longxan	NAPHO	23.94	Phongsaly	May	VANG KAO	39.41
Xaysomboun Sp	Longxan	VANGLUANG	23.94	Phongsaly	May	OM TALEUM	39.41
Xaysomboun Sp	Hom	MENGKEO	11.31	Phongsaly	Nhot ou	TAKOUXANG	29.68
				Phongsaly	Nhot ou	XEOLNDU	45.45
				Phongsaly	Nhot ou	PHINCHANG KA	45.45
				Phongsaly	Nhot ou	PHINCHANG KA	45.45
				Phongsaly	Nhot ou	PACHE OLIN	29.68
				Phongsaly	Nhot ou	KOUNGCHI	45.45
				Phongsaly	Nhot ou	PE ULAOXOU K	29.68
				Phongsaly	Nhot ou	LAO PHOU CHA	29.68
				Phongsaly	Nhot ou	PE ULAOXOU M	29.68
				Luangnamtha	Viangphou	NAMTIENG	45.78
				Luangnamtha	Viangphou	TONGMANG	46.24
				Luangnamtha	Viangphou	LAIYANG	45.78
				Luangnamtha	Nalae	LA ANG	46.24
				Luangnamtha	Nalae	TAKHEUNG	46.24
				Luangnamtha	Nalae	KAYE	45.78
				Luangnamtha	Nalae	KHANEUNG	45.78
				Luangnamtha	Nalae	SALEUANG	45.78
				Luangnamtha	Nalae	MONGKHO	45.78
				Luangnamtha	Nalae	SAKRANG	45.78
				Luangnamtha	Nalae	NEUNGPHET	45.78
				Bokeo	Pha Oudo	BONGLAOSOU	46.24
				Bokeo	Pha Oudo	HANGDOI	46.24
				Bokeo	Pha Oudo	SAMIN	46.24

List of location of flash flood risk areas with villages, districts and provinces name (Flash flood warning list)

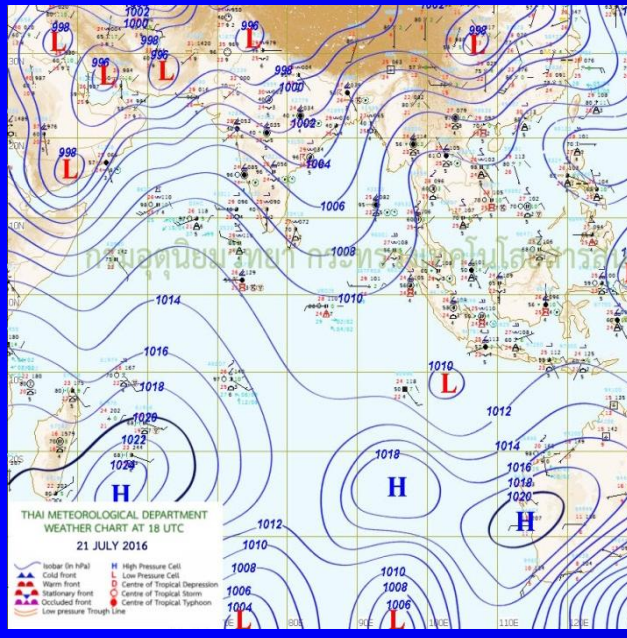
Flood Season 2016

Flash Flood in the Mekong Region

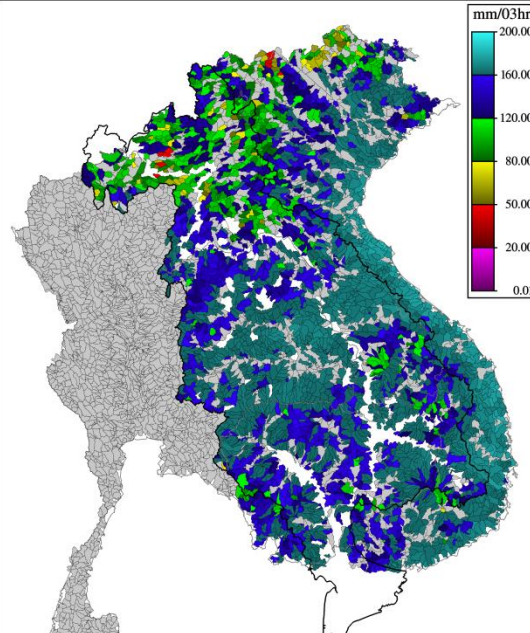


Flash Flood in Xayaboury (Lao PDR) 23 July 2016

2 | Home news | Tuesday July 26, 2016



FFG - 03 hr 2016-07-22 00:00 UTC REGIONAL



Flash flooding hits farmers in Xayaboury

Times Reporters

Almost 200 families in Botean district, Xayaboury province, have lost some or all of their crops to flash flooding after heavy rains last weekend but luckily no deaths or injuries were reported.

Botean District Governor Mr Bounsen Chanthaphong told *Vientiane Times* yesterday that on the evening of July 23, heavy rains caused widespread flooding in low-lying areas.

Some 174 families have been affected to varying degrees, mostly in Nakha, Botean, Domsavang, Taokeua and Nhai villages.

The flooded area includes 60 hectares of rice fields, 56 fish farms and some houses. Mr Bounsen said it was the first recorded instance of flash flooding in the district.

District authorities are preparing a report for the Xayaboury provincial authorities so they can take steps to help the worst affected villagers.

This year, farming families in many parts of the country have been hit by flash flooding and have lost crops as a result.

From July 10-14, over 300 hectares of farmland in six villages of Borikhan district, Borikhamxay province, were also partially underwater.

Some 900 families in communities along the Nam Xan river have been affected to varying degrees, mostly in Vatthat, Nahaen, Sisavath, Hadpho, Phonkham and Pakheuang villages.

The flooded area includes 262 hectares of rice fields and 65 hectares of cassava crops.

A one-kilometre stretch



Over 60 hectares of rice fields in Botean district, Xayaboury province, were affected by flash flooding last weekend.

of road running between Hadonkhoum and Phonkham villages and 500 metres of road in the centre of Borikhan district were also under water.

Also in Pakxan district, Borikhamxay province, over 1,000 people were cut off from neighbouring towns and districts after a road flooded there recently, with two villages having to resort to transport by boat. According to district authorities, Thabor and Songkhone villages were under water and flooding had occurred along a 300-metre stretch of the road.

Some 200 families of

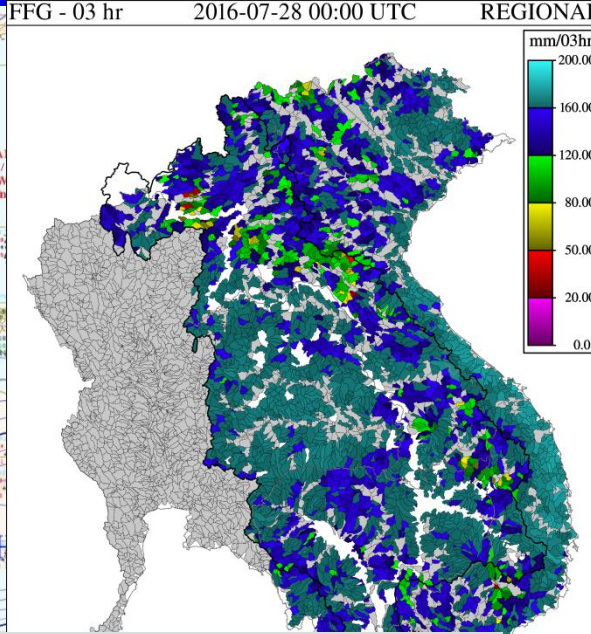
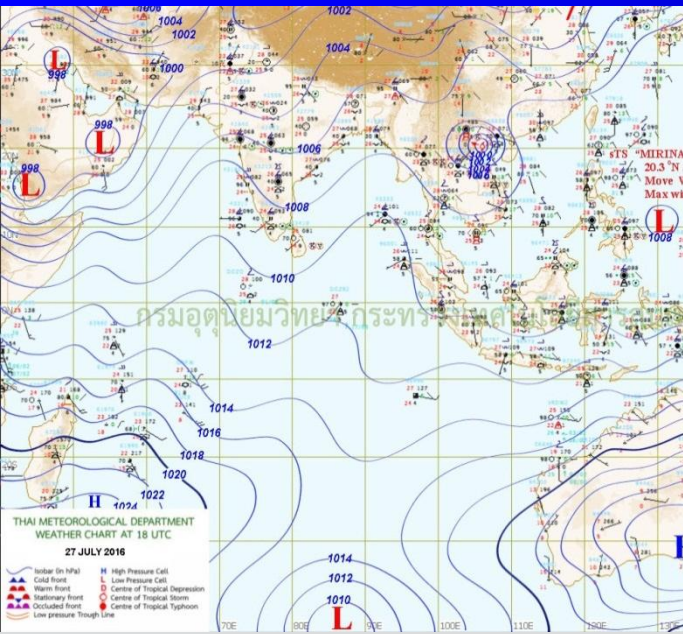
more than 1,000 people are struggling to get in and out of their villages and are using boats to get around.

These areas are vulnerable to flooding because they are low-lying and flooding has occurred here in the past. Pakxan district authorities are planning to upgrade the road to protect it from flooding in the future. According to the Xinhua news agency, some 8.6 million people were affected by floods and landslides caused by heavy rain in China last week. Officials said that at least 154 people have been killed while another 124 are missing.

Date of FFG produced		22/07/2016 00:00		UTC time			
1hour Flash Flood Guidance in Lao				3hour Flash Flood Guidance in Lao			
Provinces	Districts	Villages	FFG Value	Provinces	Districts	Villages	FFG Value
No Risk Areas	to Flash Flood Occurrence			Bokeo	Pha Oudo	KANG	44.96
				Bokeo	Pha Oudo	MOKPORN	44.96
				Bokeo	Pha Oudo	MOKSOUK	44.96
				Bokeo	Pha Oudo	MOKKHA KANG	44.96
				Bokeo	Pha Oudo	SIBOUNHEUAN	44.96
				Bokeo	Pha Oudo	PHA OU DOM	44.96
				Bokeo	Pha Oudo	THINKEO NEUA	44.96
				Xayaboury	Xienghon	MOK SA KIEN	45.09
				Xayaboury	Xienghon	HONG KHOU	45.09
				Xayaboury	Xienghon	KEW KENE	45.09
				Xayaboury	Xienghon	NGEW	45.09
				Xayaboury	Xienghon	NAM BENG	45.09
				Xayaboury	Xienghon	LAO OU	45.09
				Xayaboury	Xienghon	LAO SA NO	45.09

Flash Flood in Northern part of Viet Nam

Tropical storm Mirinae (28 July 2016)



Mirinae takes heavy toll on northern Vietnam

27 JULY 28, 2016 - 17:55:43

(http://img.en.vietnamplus.vn)

/i660/Uploaded/KG2/2016_07_28/tbvn_mua_ngap.jpg

A tree fell down on a flooded road after heavy rains in Thai Binh province (Photo: VNA)

- Typhoon Mirinae, the first to hit Vietnam this year, has caused human and property damage in the north of the country to the mainland from the midnight of July 27.

July 28, a sailor residing in Sam Son town of the northern central province of Thanh Hoa went missing after his boat broke in the sea area about 3.5km off Hon Me Island. Five other crewmembers were saved, according to the permanent board Steering Committee for Natural Disaster Prevention and Control.

a of rice in Nam Dinh and another 36,000ha in nearby Ninh Binh province were flooded.

person was killed and five others sustained injuries during the storm in Dai Thang commune, outlying Phu Xuyen district. re deluged by heavy rainfalls while strong winds uprooted 667 trees, hampering traffic flow. Up to 130 electricity poles fell of crops were flooded in My Duc district alone.

ing of July 28, two people in Thai Binh province were wounded. Torrential rains inundated 39,300ha of rice and destroyed er crops. Storm Mirinae also damaged nearly 30 classrooms in Vu Thu district and two brick factories in Thai Thuy district, 3,000 trees in Thai Binh province.

ts were reported across Thai Binh since the midnight and the problem has yet to be fixed, said the province's steering ral disaster prevention, search and rescue.

ees fell down in Hung Yen province, where widespread power outages last for 12 hours from 10 pm of July 27. Around h Tien Lu province were deep under water, and nearly 800ha of longan trees in Hung Yen city were damaged. Strong w away roofs and advertising banners there.

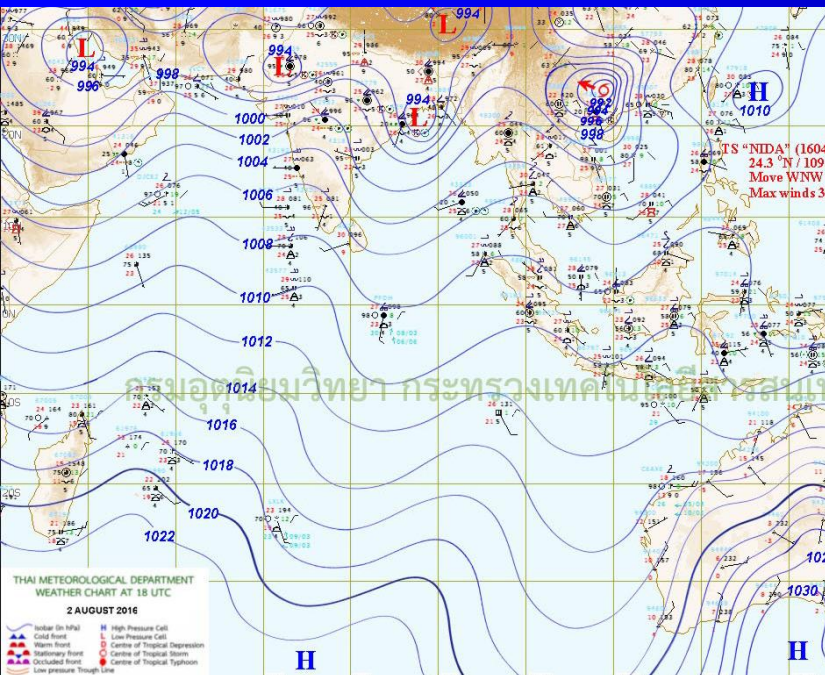
ince, by 9 am of July 28, the tropical storm flooded almost 28,500ha of rice and 3,000ha of other crops, knocked down ver 3,100 trees and unroofed some 1,000 houses, the local disaster prevention agency said.

Three residents in Thai Nguyen province and one other in Hoa Binh province were injured during the storm, which triggered blackouts in Hoa Binh and Hai Duong provinces. It also wreaked havoc on crops, livestock and houses in these localities.

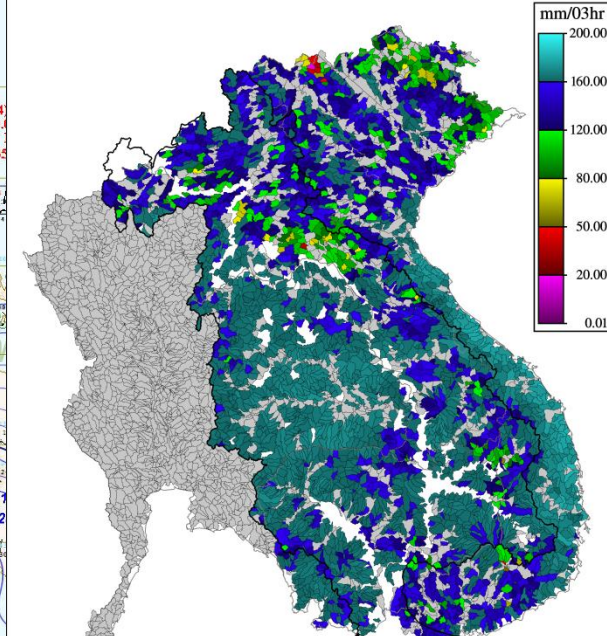
In the face of the heavy toll, the Prime Minister on July 28 requested the People's Committees of the northern localities and Thanh Hoa province, ministries, and the Central Steering Committee for Natural Disaster Prevention and Control to summon resources to address the storm's consequences. -VNA

Date of FFG products		28/07/2016 00:00 UTC time			
1hour Flash Flood Guidance in Vietnam			3hours Flash Flood Guidance in Vietnam		
Provinces	Districts	FFG value	Provinces	Districts	FFG Value
No Risk Areas	to Flash Flood	Occurence	Nghe An	Tuong Duong	49.78
			Nghe An	Con Cuong	49.78

Flash Flood in Lao Cai (Viet Nam) Tropical storm NIDA (5 Aug 2016)



FFG - 03 hr 2016-08-03 06:00 UTC REGIONAL



Saturday August 6, 2016

11 killed or missing in Lào Cai Province floods

LÀO CAI — At least four people were dead and another seven missing after flooding struck northern Lào Cai Province, authorities reported yesterday.

Lào Cai People's Committee said that they believed many others were still trapped under earth and rocks following a flash flood on Thursday night.

Typhoon Nida brought heavy rain and thunderstorms to northern Việt Nam after making landfall on Tuesday night.

The mountainous Bát Xát District suffered the heaviest human loss in the flooding with three people killed while six are still missing.

One of the dead was from Sa Pa District as was one of the missing.

Lào Cai Steering Committee for Disaster Prevention and Rescue (SCDPR) said that at least 76 households in Bát Xát's Phin Ngan and Quang Kim communes were isolated by the flooding as bridges and roads were cut off.

More than 100 households in Cốc Sạn commune were partially flooded.

Over 10,000ha of paddy fields and another 1,000ha of vegetables were under water or rocks wrought with the flash flood, according to the SCDPR.

Farmers took another blow from the terrible weather as more than 200 animals were killed in the flood.

The SCDPR estimated damages caused by the flood so far at more than VNĐ200 billion (US\$3.9 million).

Lào Cai Hydro-meteorological Centre Director Lưu Minh Hải said that Bát Xát received 152mm of rain as of yesterday morning, while some 63mm and 72mm fell across Lào Cai City and Bảo Yên District respectively.

"Lào Cai residents have not seen such a big flood and downpour since 2008," he told Dân Việt (Vietnamese folks) newspaper yesterday.

Heavy downpours triggered massive landslides in the region, temporarily halting traffic within Lào Cai and to other localities.

Municipal Department of Transportation (DoT) Director Nông Văn Hùng said that about 13,000 cubic metres of earth and rocks fell over a section of the 4D National Highway in Sa Pa District. The highway connects Lào Cai and neighbouring Lai Châu Province.

Hùng said that all vehicles are now barred from travelling on the Lào Cai - Lai Châu section of the 4D highway. The ban started yesterday and will last until further notice from the DoT.

Traffic jams were also reported on routes leading to Sa Pa and connecting Bát Xát district centre to other communes including Phin Ngan, Quang Kim and Tông Sành.

Traffic suspended

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Disaster relief

Deputy Minister Trịnh Đình Dũng yesterday afternoon visited Lào Cai to monitor the rescue and the disaster relief work.

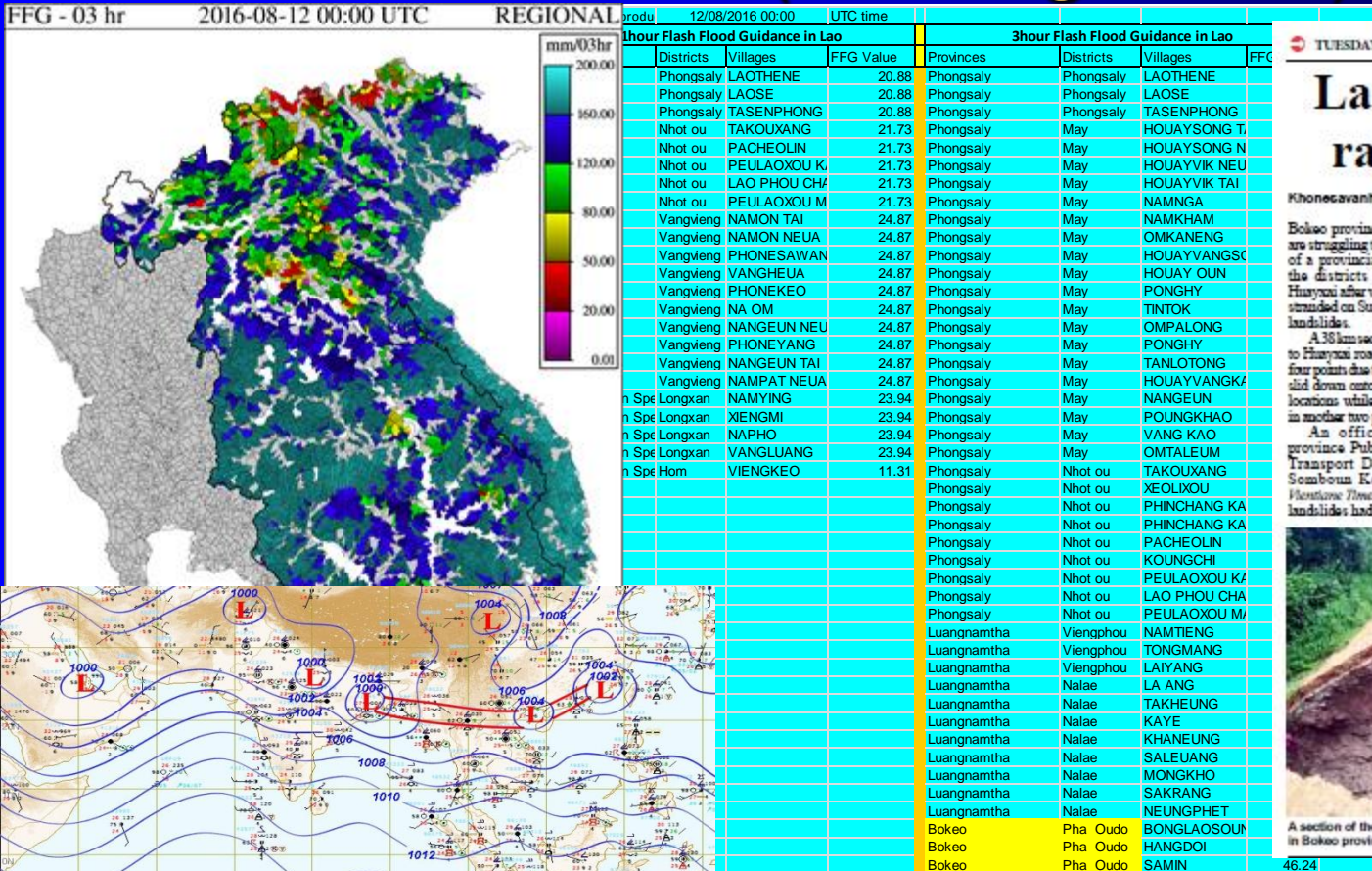
He asked local authorities to urgently look for the missing persons and prepare temporary accommodation and enough food for residents who lost their houses in the flooding.

Prime Minister Nguyễn Xuân Phúc also ordered the National Committee for Search and Rescue and the ministries of Public Security and National Defence to deploy forces based in the region to look for the missing persons and provide disaster relief.

Local health facilities were asked to offer free treatment to the injured and to help residents in the clean-up work for disease prevention after the flood ceases. — VNS

Date of FFG products			03/08/2016 06:00 UTC time		
1hour Flash Flood Guidance in Vietnam			3hours Flash Flood Guidance in Vietnam		
Provinces	Districts	FFG value	Provinces	Districts	FFG Value
Lao Cai	Bat Xat	13.39	Lao Cai	Bat Xat	36.09
Bac Kan	TX. Bac Kan	14.89	Lao Cai	Sa Pa	49.04
Bac Kan	Bach Thong	14.89	Lao Cai	Than Uyen	49.04
Lai Chau	Phong Tho	13.39	Bac Kan	TX. Bac Kan	21.36
			Bac Kan	Bach Thong	21.36
			Lai Chau	Phong Tho	37.06
			Dak Lak	Dak R'Lap	47.03
			Dak Lak	Dak Nong	47.03
			Lam Dong	Bao Lam	47.03

Flash Flood in Bokeo of Lao PDR ITCZ (13 Aug 2016)



TUESDAY AUGUST 16, 2016 ISSUE 189

Landslides follow heavy rains in nation's north

Khonesavanh Latsaphao

Bokeo province road workers are struggling to repair sections of a provincial link between the districts of Pakkha and Huayxai after vehicles were left stranded on Sunday evening by landslides.

A 38 km section of the Pakkha to Huayxai road has been cut at four points due to mudslides. Soil slid down onto the road in two locations while it has collapsed in another two places.

An official from the province Public Works and Transport Department Mr Somboun Keuthong told *Flashline Times* on Monday the landslides had cut off the road on Sunday due to heavy rain that lashed the province since Friday last week.

Many motorists and tourists on the way needed a ride back to find somewhere to stay in Pakkha district town's guesthouses.

Workers started their repairs on Monday but were finding it difficult because of the weather.

"Right now it is not easy for workers on the road because it is still raining. If there is no more rain the road may be reopened again on Tuesday evening," he said.

Mr Somboun explained that two sections of the road collapsed adjacent to the flooded Tha River due to the torrential rain in parts of the northern provinces.

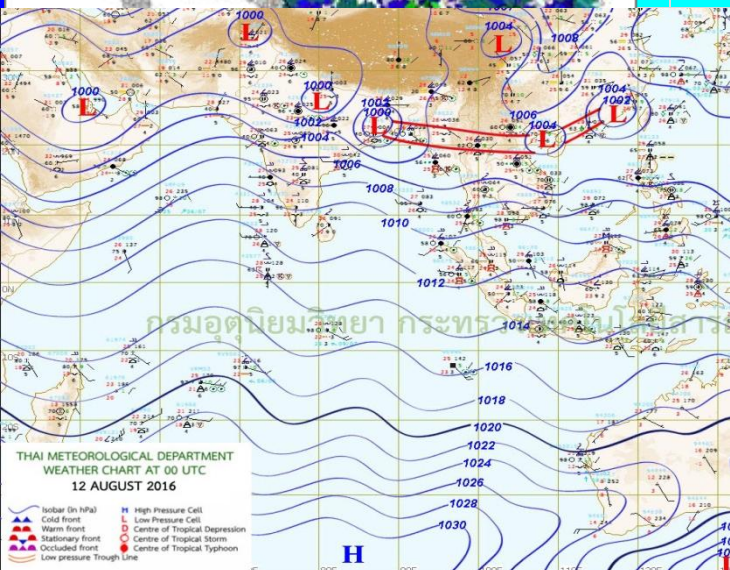
Road users and tourists can use an alternative road through Xay district and another via Pakksang district in Oudomxay province to link to the town of Huayxai district in Bokeo province. The route via Pakksang district in Oudomxay province cannot be used to connect with Huayxai district as it is cut off in Pakkha district of the Bokeo province.

An official from Oudomxay province Mr Khonesavanh Latsaphao said on Monday afternoon a section of National Road 2W at Vanglam Bridge in Houm district located between Xay and Pakksang districts that was flooded on Friday morning has seen vehicles starting to cross on Monday after water receded.

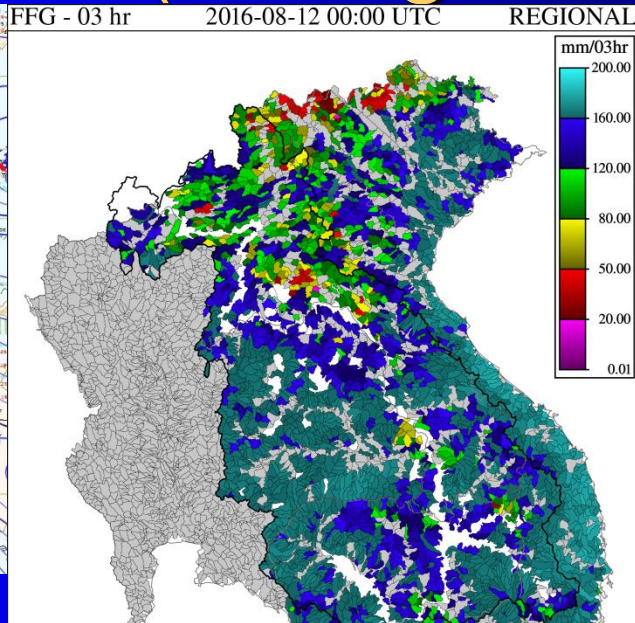
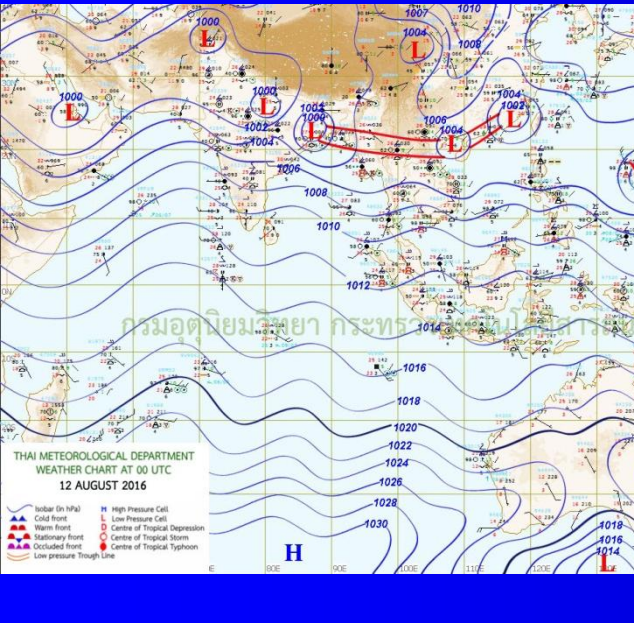
She added there had been no more rain and even sunshine again in Houm district on Monday morning. However, some streets in the town of Oudomxay province's Xay district remained flooded following some more rain in the afternoon, but it started to recede by 3:30 pm that day after the rain stopped.

About 170 houses in four villages of Hongsa district in Xayaboury province were also flooded due to heavy rain on Friday.

A section of the collapsed road linking Pakkha to Huayxai districts in Bokeo province.



Flash flood in Lao Cai of Viet Nam ITCZ (13Aug 2016)



Deaths, damage in torrential northern rains



Muong Lai district in central Thanh Hoa Province was isolated by floods yesterday. Downpour and flooding have wreaked havoc in northern and northcentral regions over the past few days, killing at least four people. — VNA/VNS Photo

HÀ NỘI — At least four people died, one is missing and three were injured after torrential rains swept through the northern and north-central regions over the past few days, according to the latest report from the Central Steering Committee on Natural Disaster Prevention and Control.

The downpour, triggered by an intertropical convergence zone, reached 200–400mm in some areas.

In the central province of Thanh Hoa, 200mm of rainfall and subsequent flooding was recorded in Muong Lai District yesterday, killing one person and washing away four houses. Cao Van Chuang, Chairman of the district People's Committee said.

The district was inaccessible to transportation at several sections of National Road 15C connecting this mountainous district with other localities were eroded. More than 30 hectares of rice and other crops were damaged.

As complex rain developments are forecast, local authorities have evacuated 10 families from flood-prone areas and reduced plans to minimize flood impacts and stricken people.

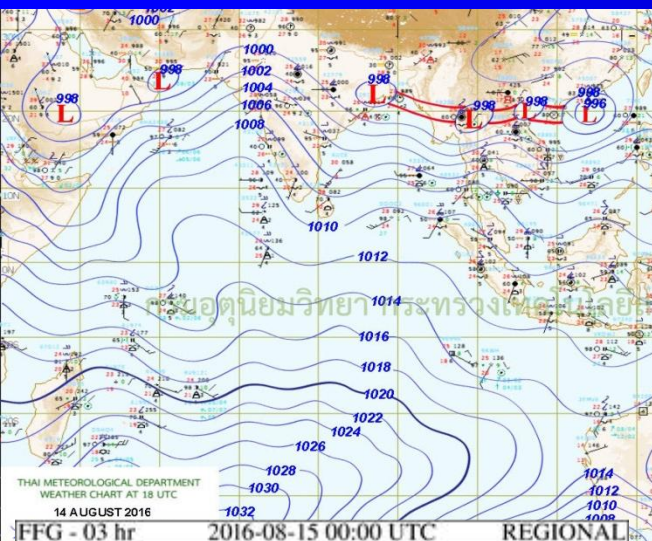
The southern mountainous province of Lao Cai on Sunday reported one dead and one missing after torrential rains hit the locality.

The southern mountainous province of Binh Hoa reported two deaths, including two children who were swept away by downpour-triggered floods on Friday.

— VNA/VNS Photo

Date of FFG products			12/08/2016 00:00 UTC time		
1hour Flash Flood Guidance in Vietnam			3hours Flash Flood Guidance in Vietnam		
Provinces	Districts	FFG value	Provinces	Districts	FFG Value
Lao Cai	Bat Xat	17.30	Ha Giang	Yen Minh	45.47
Lao Cai	Sa Pa	17.81	Ha Giang	Bac Me	45.47
Lao Cai	Than Uyen	18.01	Ha Giang	Hoang Su Phi	42.32
Lai Chau	Phong Tho	17.65	Ha Giang	Vi Xuyen	43.36
			Ha Giang	Xin Man	39.98
			Ha Giang	Bac Quang	42.89
			Cao Bang	Bao Lac	45.47
Lao Cai			Lao Cai	TX. Lao Cai	36.53
Lao Cai			Lao Cai	Muong Khuong	46.44
Lao Cai			Lao Cai	Bat Xat	25.83
Lao Cai			Lao Cai	Bac Ha	41.34
Lao Cai			Lao Cai	Bao Thang	46.44
Lao Cai			Lao Cai	Sa Pa	26.50
Lao Cai			Lao Cai	Bao Yen	43.24
Lao Cai			Lao Cai	Than Uyen	23.60
Lai Chau			Lai Chau	Muong Te	42.33
Lai Chau			Lai Chau	Phong Tho	28.24
Lai Chau			Lai Chau	Sin Ho	41.12
Lai Chau			Lai Chau	Muong Lay	42.61

Flash flood in northern provinces of Thailand ITCZ (14-15Aug 2016)



Nan residents affected by flash floods

16 Aug 2016 | (90 Visitor) |



NAN, 16 August 2016 (NNT) - Seven districts in Nan province have suffered heavy flooding, after a low pressure trough brought heavy rain to the North of Thailand.

Nan Governor Suwat Promsuwan has declared disaster zones across 127 subdistricts, as access to food and clean water has been cut off by the rising waters. Authorities have been trying to reach out to disaster-stricken people to deliver basic necessities. A group of soldiers from the 38th Military Circle used a large army truck to reach severely flooded areas to evacuate residents to higher ground.

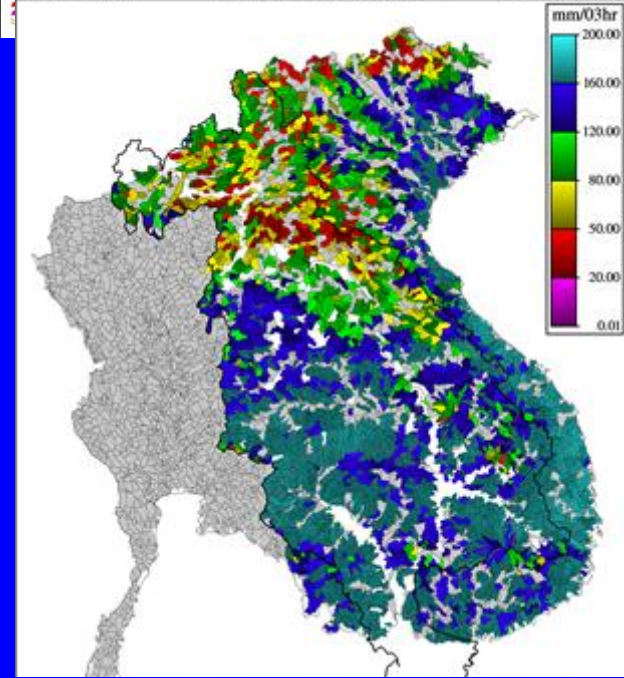
Water levels in all rivers have reportedly increased significantly, with some overflowing the embankments and flooding riverside communities. Several roads in the capital district and a bridge over the Nan River remain inundated.

Authorities have deployed four water pumps to redirect water from the overflowing rivers. Water pumps have also been used at Nan Provincial Prison, as floodwaters have reached the inner cells. All inmates have been moved to the second level of the prison.

The communities of Phumin and Ban Thalee have been struggling as homes were submerged three meters deep in floodwaters. Nan City Mayor Surapol Thiensut and a team of municipal officials visited Ban Thalee and ordered the removal of all manholes covers, for fear the situation may exacerbate in the municipality. Mr. Surapol said it is possible the flood situation could reach the crisis levels seen in 2006 and 2011.

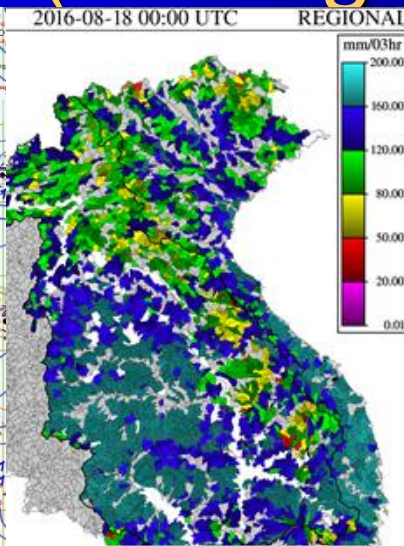
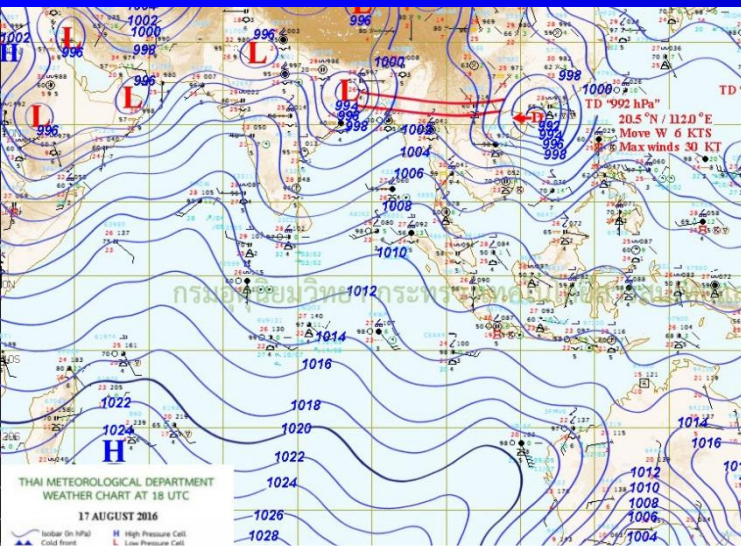
The low pressure trough is expected to linger over the upper parts of the country until the end of the week, during which residents have been warned of possible flash

FFG - 03 hr 2016-08-15 00:00 UTC REGIONAL



Date of FFG products		15/08/2016 00:00 UTC time			
1hour Flash Flood Guidance in Thailand			3hour Flash Flood Guidance in Thailand		
Provinces	Districts	FFG Value	Provinces	Districts	FFG Value
Chiang Rai	Chiang Khong	20.86	Chiang Rai	Chiang Khong	27.76
Chiang Rai	Chiang Saen	20.86	Chiang Rai	Chiang Saen	27.76
Chiang Rai	Thoeng	20.38	Chiang Rai	Thoeng	28.33
Nan	King Amphoe Song Ki	22.82	Chiang Rai	Mae Suai	45.54
Nan	Song Kwae	16.47	Chiang Mai	Fang	45.54
Lampang	Ngao	14.82	Chiang Mai	Mae Ai	45.54
Lampang	Wang Nua	14.82	Nakhon Ratchasima	Pak Chong	44.00
Phayao	Muang Phayao	14.82	Nakhon Ratchasima	Wang Nam Khieo	44.00
Phayao	Chiang Kham	18.42	Nan	Mae Charim	48.84
			Nan	King Amphoe Bokuai	48.84
			Nan	King Amphoe Song Khae	30.56
			Nan	Song Kwae	23.77
			Prachinburi	Prachantakham	44.00
			Lampang	Ngao	21.97
			Lampang	Wang Nua	21.97
			Phayao	Muang Phayao	21.97
			Phayao	Chiang Kham	26.05

Flash flood in Luang Prabang Lao PDR ITCZ (18 Aug 2016)



FRIDAY AUGUST 19, 2016 ISSUE 192

Flash flooding in Luang Prabang kills woman, damages crops

Times Reporters

Flash flooding in northern parts of the country including Luang Prabang province has taken one life, destroyed many hectares of rice and other crops and washed away houses and irrigation channels and livestock.

The woman who was killed was identified as Ms Thong of Houmno villages, Phouxy district, the secretary of the Luang Prabang provincial disaster management and prevention committee. Ms Champhang Phedara told *Herald* Times yesterday.

Officials also reported that more than 1,000 families in nine districts of Luang Prabang province were impacted by the recent flash flooding after heavy rain over the period from August 8-15.

More than 10 houses were damaged, a tractor and a bicycle were broken and 900 hectares of upland and wet season rice were damaged or destroyed.

Some 753 hectares of other crops also suffered varying extents of damage while seven buffaloes, 39 pigs and almost 300 poultry were reported as lost.

The flooding also saw damages sustained by irrigation channels, wood bridges and irrigation dams.

The worst impacted areas were the districts of Champasat, Nua, Nisangwan and Phouxy. It is expected that the loss and damage figures will rise after all reports are compiled by local authorities, Ms Champhang said.

Other northern provinces such as Bolikhamxay, Oudomxay and Paktia were also affected by similar flooding but not all reports have been compiled as yet.

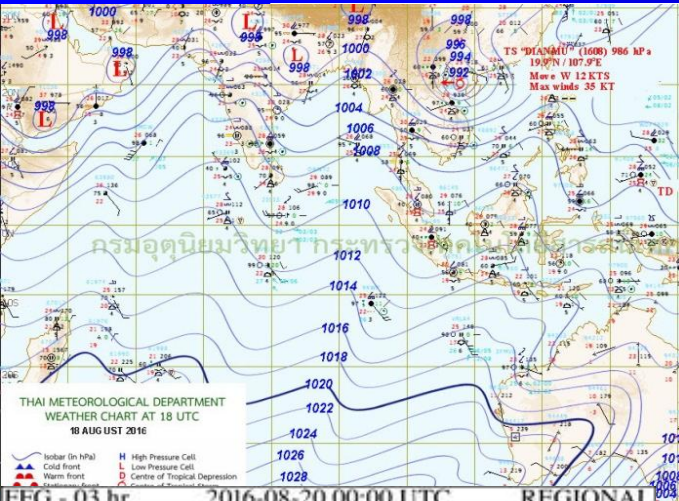
Some 139 families in the three districts of Houayxay, Phou-Oudom and Paktia were

Flash flooding in Oudomxay province has made road travel difficult.

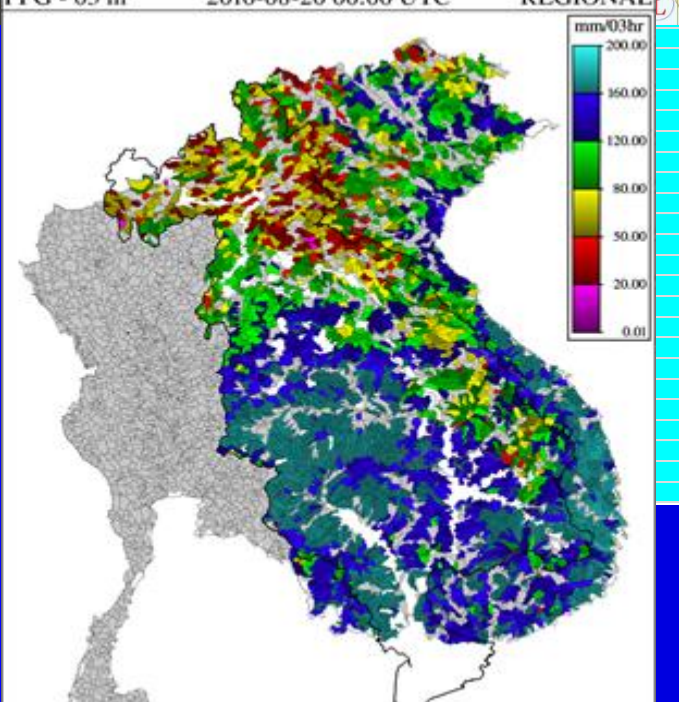
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1hour Flash Flood Guidance in Lao				3hour Flash Flood Guidance in Lao			
Provinces	Districts	Villages	FFG Value	Provinces	Districts	Villages	FFG Value
No Risk Areas	to Flash F	Occurence		Luangprabang	Ngoi	HUAYLAAN	40.17
				Luangprabang	Ngoi	LONGKHOUN	40.17
				Luangprabang	Ngoi	CHORMYING	40.17
				Luangprabang	Ngoi	HUAYTHONG	40.17
				Luangprabang	Ngoi	PHONEXAI	40.17
				Luangprabang	Ngoi	HUAYNGONE	40.17
				Luangprabang	Ngoi	HUAYKHONG T	40.17
				Luangprabang	Ngoi	HUAYKHONG N	40.17
				Luangprabang	Ngoi	KEWKAAAN	40.17
				Khammuane	Bualapha	NA PHAO	37.31
				Khammuane	Bualapha	NONG BOUA	37.31
				Savannakhet	Phine	PATONG	39.32
				Savannakhet	Phine	KAPANG	39.32
				Sekong	Kaleum	SONGKHORN	40.45
				Sekong	Kaleum	HATPAE	40.45
				Sekong	Kaleum	CHING	40.45
				Sekong	Kaleum	TAHEW	40.45
				Sekong	Kaleum	VAK NEUA	40.45
				Sekong	Kaleum	VAK TAI	40.45
				Champasak	Pathoomph	NAMPHAAK	30.08

Flash Flood in Northern Part of Viet Nam TS Dianmu(19-20 Aug 2016)



3hours Flash Flood Guidance in Vietnam		
Provinces	Districts	FFG Value
Ha Giang	Dong Van	39.95
Ha Giang	Meo Vac	32.48
Ha Giang	Yen Minh	39.09
Ha Giang	Quan Ba	36.60
Ha Giang	Bac Me	36.51
Ha Giang	Vi Xuyen	37.64
Cao Bang	Bao Lac	33.58
Cao Bang	Ha Quang	40.55
Cao Bang	Thong Nong	40.00
Cao Bang	Nguyen Binh	40.54
Cao Bang	Hoa An	40.00
Lao Cai	Bat Xat	32.78
Lao Cai	Sa Pa	38.67
Lao Cai	Than Uyen	38.51
Bac Kan	TX. Bac Kan	29.46
Bac Kan	Ba Be	41.63
Bac Kan	Bach Thong	29.46
Phu Tho	Thanh Son	45.37
Lai Chau	TX. Lai Chau	38.89
Lai Chau	Muong Te	34.98
Lai Chau	Phong Tho	33.85
Lai Chau	Sin Ho	39.62
Lai Chau	Muong Lay	39.13
Lai Chau	Tuan Giao	29.44
Lai Chau	Dien Bien	38.99
Lai Chau	Dien Bien Dong	36.22
Son La	TX. Son La	34.96
Son La	Quynh Nhai	43.37
Son La	Muong La	43.37
Son La	Thuan Chau	39.41
Son La	Mai Son	36.55
Son La	Song Ma	33.57
Son La	Moc Chau	40.38
Hoa Binh	Da Bac	41.47
Hoa Binh	Mai Chau	39.97
Hoa Binh	Ky Son	33.17
Hoa Binh	Tan Lac	42.23
Thanh Hoa	Muong Lat	45.26
Thanh Hoa	Quan Hoa	43.22
Thanh Hoa	Quan Son	47.33
Thanh Hoa	Ba Thuc	42.23
Nghe An	Tuong Duong	31.15
Nghe An	Con Cuong	35.11
Nghe An	Thanh Chuong	48.80
Quang Binh	Minh Hoa	40.60



Typhoon Dianmu kills seven in VN

HÀ NỘI — Typhoon Dianmu has so far cost the lives of at least seven people and left another two missing after sweeping through northern Việt Nam over the weekend.

Eight people were also injured due to falling trees, collapsed houses and landslides as the raging typhoon made landfall on Friday, reported the Office of the Central Steering Committee for Disaster Prevention (OCSDP) as of 7am yesterday.

Yên Bái Province was hit the hardest with two deaths and one injured. Other provinces of Sơn La, Lào Cai, Hòa Bình, Bắc Giang and Nghệ An each had one fatality.

Floods in Bắc Giang and Lào Cai provinces washed away two people who have yet to be found.

The capital Hà Nội, which witnessed several big trees uprooted in the typhoon, had three injuries reported. So did the neighbouring Vinh Phúc Province while the typhoon sent one member of the public to hospital in Phú Thọ Province.

The OCSDP reported 44 houses destroyed and washed

away in the flooding across 13 localities hit by typhoon Dianmu, which also ripped the roofs from more than 650 houses and left others, over 1,510, under water. At least 2,154 families were forced to undergo emergency evacuation prior to the typhoon.

Nearly 2,000 cattle and poultry were killed, while over 10,000 ha of paddy fields and vegetables were flooded. Hà Nội accounted for one third of the destroyed farm land with about 3,064ha flooded, followed by Vinh Phúc Province with 2,698ha.

Some 252 trees were uprooted and strewn across streets, and in some cases damaged adjacent buildings and vehicles parked under them. Fourteen bridges across the affected provinces were severely damaged. Thousands of roads, canals and dams were submerged and degraded.

Blackouts occurred in a number of areas due to fallen power poles and damaged transmission lines.

The national flag-carrier Vietnam Airlines had to cancel 10 flights due to the typhoon while Vietjet Air called off 15. Dozens of flights to and from the north-

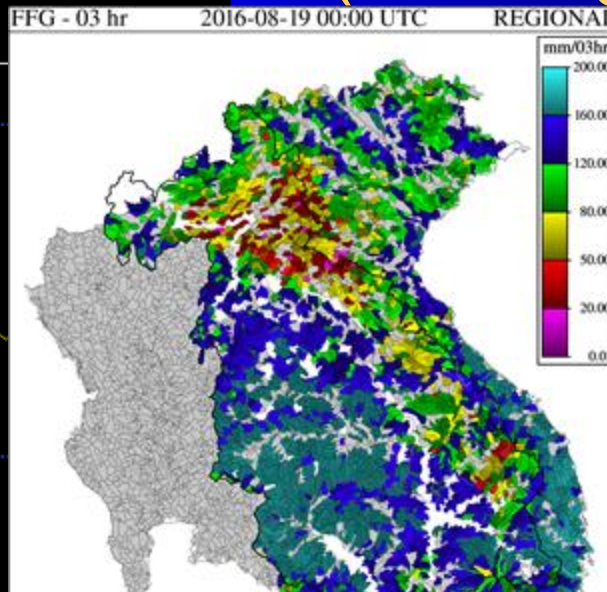
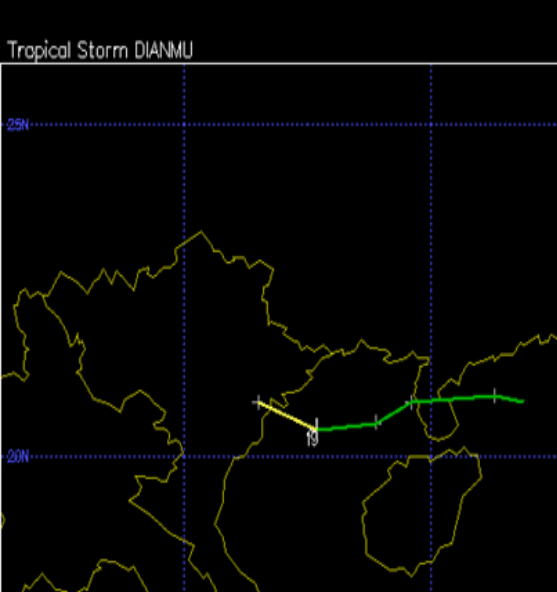
ern region were also delayed for hours as Dianmu caused heavy winds and downpours across the area.

Agriculture Minister-Head of the Central Steering Committee on Disaster Prevention and Control Nguyễn Xuân Cường on Saturday morning chaired a meeting reviewing storm response and post-storm recovery.

On-site missions were deployed across the affected localities to assess and promptly address the consequences of the storm and post-storm flash floods. Local authorities had pumping machines running around the clock to pump water from paddy fields, while residents were repairing damaged houses, roads and cleaning up their living environment.

Typhoon Dianmu was the third of its kind to batter Việt Nam this year. The first two typhoons, Mirinae and Nida, killed 20 people and injured another 82. They caused damages of more than VNĐ6.7 trillion (US\$297.7 million), according to the Ministry of Agricultural and Rural Development. — VNS

Flash Flood in Lao PDR Ts Dianmu(20 Aug 2016)



SATURDAY AUGUST 20, 2016 ISSUE 193 www.vietnamtimes.com

Typhoon Dianmu passes over northern provinces

Times Reporters

The remnants of Typhoon Dianmu passed over northern Laos yesterday, bringing with it strong winds and heavy rain after making landfall in north-central Vietnam on Thursday night.

The tropical storm brought direct impacts to northern provinces such as Houaphan, Phongsavay and Xieng Khouang, while rain also extended over the central provinces, according to the Lao Meteorology and Hydrology Department.

Strong winds and heavy rain as a result of the passing of the typhoon caused landslides, flash flooding, and rising river levels, particularly in Mekong River tributaries.

Many tributaries in northern areas are now at high to dangerous levels. Meanwhile people in the central provinces, especially those living along the Nongphay and Nam river catchments, can also expect flood impacts.

The flash flooding in the northern provinces has inundated people's houses, and caused losses of livestock, poultry and farmed fish stocks.

Some roads linking northern districts are now difficult to travel on but passable while other routes have been completely cut off by landslides or washouts.

The department had already warned members of the public on Wednesday August 17 to prepare and be ready for this tropical storm.

Authorities remain concerned that people living along the tributaries of the Mekong may suffer worse impacts as waters can rise quickly in areas outside the flood plains.

Rain is expected to continue in the northern provinces until August 21, after which the weather is expected to clear.

Flash flooding so far this rainy season has caused thousands of hectares of upland and wet season rice to be damaged, along with the loss of hundreds of livestock, as well as poultry and fish stocks.

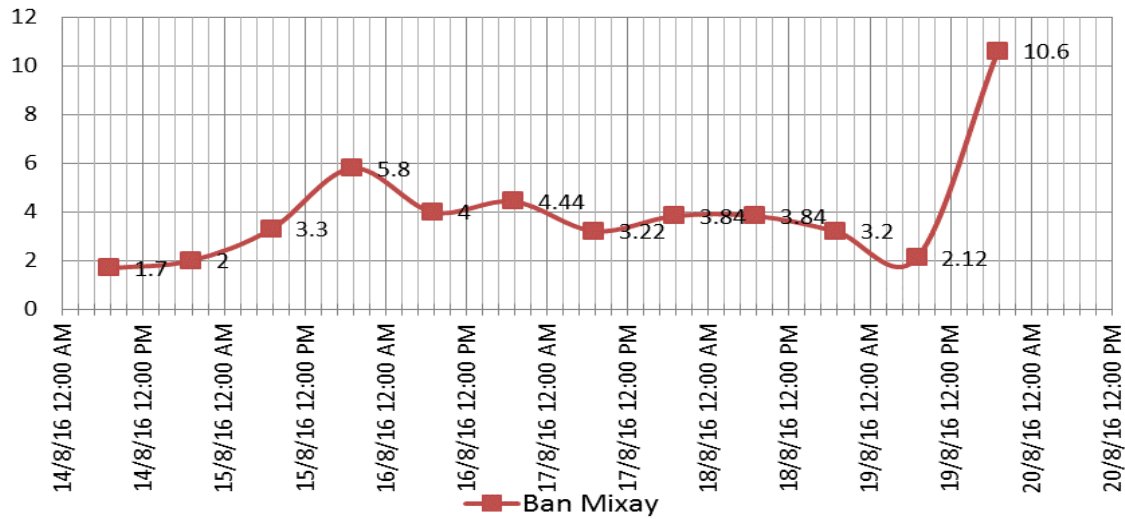
Many roads and irrigation systems have also suffered varying extents of damage. Most of the victims are people who live in northern and central provinces, local media has reported.

However, all scheduled Lao Airlines domestic flights from Wattay International Airport in Vientiane still departed yesterday, despite the storm passing over Laos.

Vietnam's domestic airlines had to cancel numerous flights arriving or departing from the country's

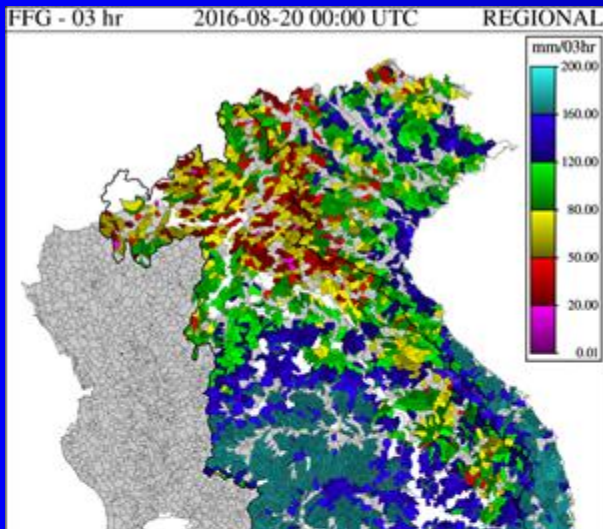
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Hydrograph of Ban Mixay



Villagers in Kham district, Xieng Khouang province have seen their houses inundated.

Flash Flood in Northern Part of Thailand TS Dianmu(20 Aug 2016)



Tuesday, August 23rd, 2016 | Posted by Editor

Three Villagers Die from Flooding in Chiang Rai



Residents have been warned of possible flash floods and forest runoffs due to torrential rain

CHIANG RAI – The Northern Meteorological Centre warned that more heavy rain is expected in Chiang Rai and 11 other northern provinces. Three villagers died from flooding in separate areas of Chiang Rai on Saturday.

They were identified as Chan Yuenyongsaen, 80, from Mae Chan district, Thep Saengkaew, 58, from Mae Suai district, and Boonruang Phumthawong, from Muang district.

Residents have been warned of possible flash floods and forest runoffs due to torrential rain.

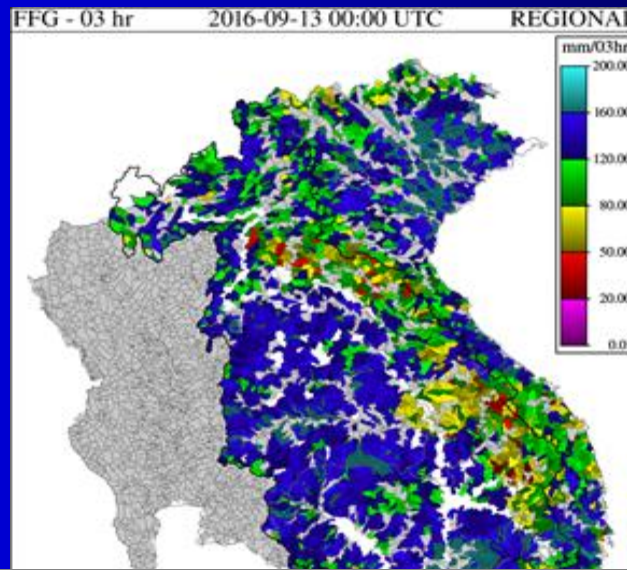
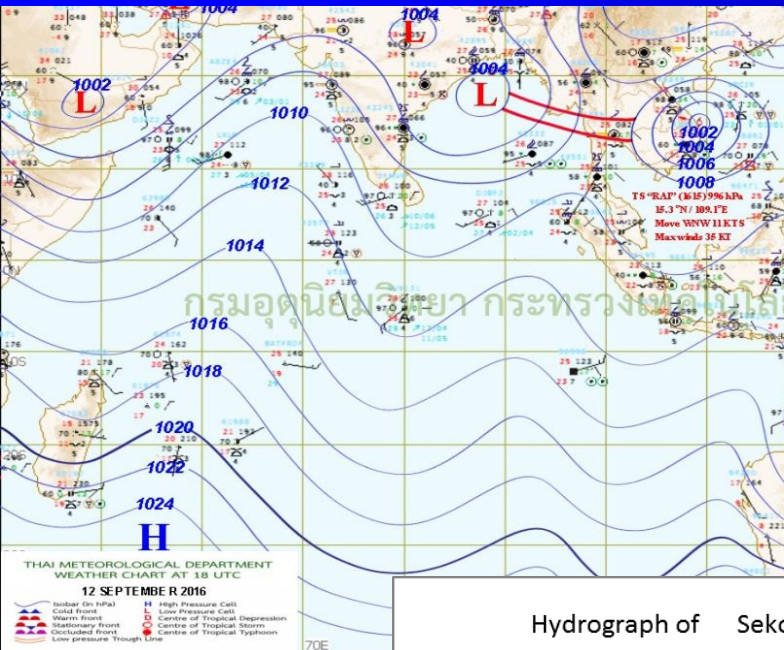
The Northern Meteorological Centre warned that more heavy rain is expected in Chiang Rai and 11 other northern provinces as Tropical Storm Dianmu batters northern Thailand.

Residents in the north have been urged to get prepared and keep monitoring information about the water situation from authorities and the media.

Date of FFG products 20/08/2016 00:00 UTC time

1hour Flash Flood Guidance in Thailand			3hour Flash Flood Guidance in Thailand		
Provinces	Districts	FFG Value	Provinces	Districts	FFG Value
Chiang Rai	Muang Chiang Rai	14.07	Chiang Rai	Muang Chiang Rai	14.07
Chiang Rai	Chiang Khong	8.62	Chiang Rai	Chiang Khong	8.62
Chiang Rai	Chiang Saen	8.62	Chiang Rai	Chiang Saen	8.62
Chiang Rai	Thoeng	15.75	Chiang Rai	Thoeng	15.75
Chiang Rai	Mae Suai	15.85	Chiang Rai	Phan	15.85
Chiang Rai	Wiang Pa Pao	14.24	Chiang Rai	Mae Chan	14.24
Chiang Rai	King Amphoe Mae Lao	14.07	Chiang Rai	Mae Suai	14.07
Chiang Mai	Fang	17.03	Chiang Rai	Wiang Pa Pao	17.03
Chiang Mai	Phrao	14.24	Chiang Rai	King Amphoe Mae Lao	14.24
Chiang Mai	Mae Ai	16.41	Chiang Mai	Fang	16.41
Chiang Mai	King Amphoe Chaipak	17.21	Chiang Mai	Phrao	17.21
Nan	King Amphoe Song Khro	16.10	Chiang Mai	Mae Ai	16.10
Nan	Song Kwae	15.58	Chiang Mai	King Amphoe Chaipakan	15.58
Lampang	Ngao	13.73	Nan	King Amphoe Song Khae	13.73
Lampang	Wang Nua	13.73	Nan	Song Kwae	13.73
Phayao	Muang Phayao	13.73	Phitsanulok	Chat Trakan	13.73
Phayao	Chiang Kham	15.67	Lampang	Ngao	15.67
			Lampang	Wang Nua	
			Uttaradit	Nam Pat	
			Phayao	Muang Phayao	
			Phayao	Mae Chai	
			Phayao	Chiang Kham	

Flash Flood in Southern Part of Lao PDR ITCZ (13 Sept 2016)



WEDNESDAY SEPTEMBER 14, 2016 ISSUE 214

Heavy rain lashes southern provinces

Times Reporters

While some areas remain unaffected by strong winds and heavy rain as forecast from September 13-15, there has been significant rainfall in other parts of the south, according to the Meteorology and Hydrology Department. Officials in at-risk areas are monitoring river levels in Khammuan, Savannakhet, Champassak, Saravan, Xekong and Attapeu provinces; and are ready to respond to flash flooding if the rainfall

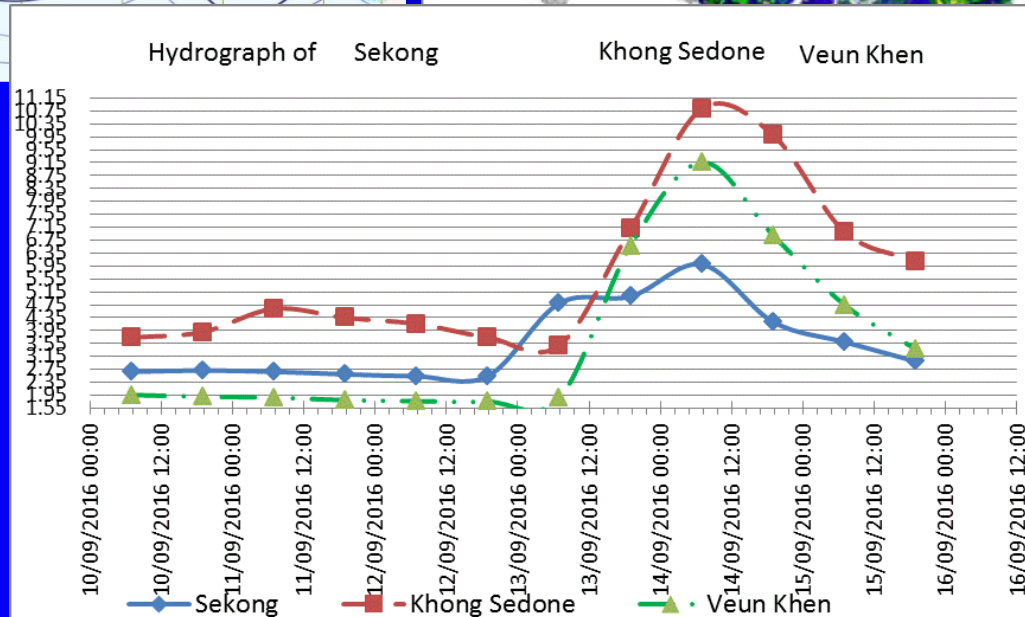
increases. An official from the meteorology and hydrology office in Xekong province told *Vientiane Times* yesterday that Xekong is one of the areas in the path of a storm blowing in from the east, after weather forecasters warned of strong winds and heavy rain.

After hours of heavy rain that began on the evening of September 12 and continued into the morning of September 13, some communities on low-lying ground in Lanxang district

CONTINUED PAGE 2



Some low-lying areas of Xekong province were flooded yesterday.

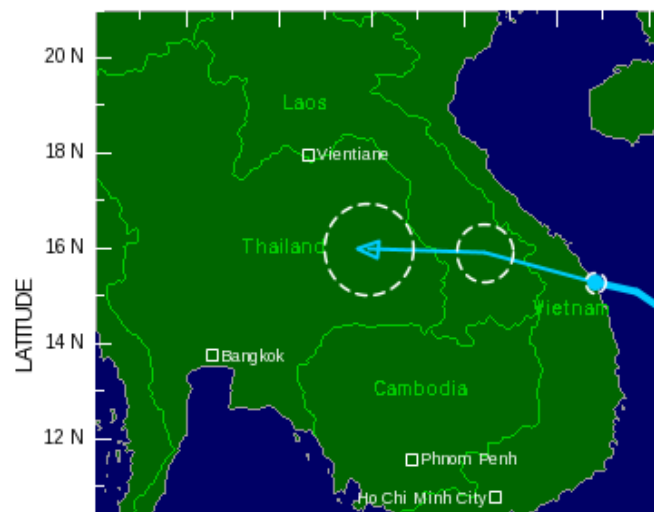


Flash flood in central Viet Nam

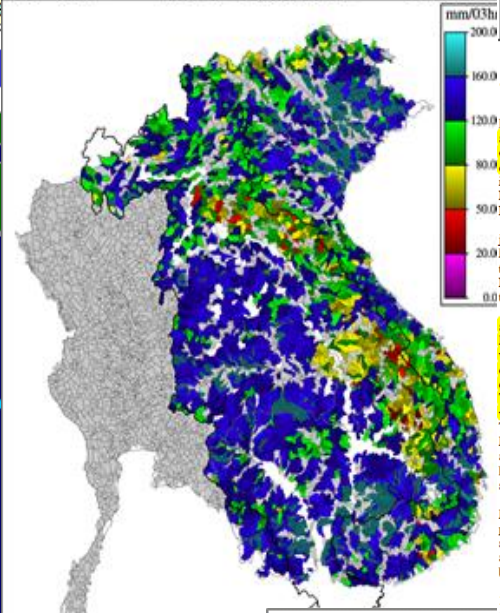
TS Rai (13 Sept 2016)

Current Update 12 Sep, 2016 18:00 Prior Wind Affect

PAST AND FORECAST TRACK



FFG - 03 hr 2016-09-13 00:00 UTC REGIONAL



NATIONAL

5 dead, 10 missing following Storm Rai

HÀ NỘI — Storm Rai has killed at least five people and left ten others missing over the past few days in central localities, according to the latest report from the National Steering Committee for Disaster Prevention and Control.

Some 26 people were also injured due to falling trees, collapsed houses and landslides after the storm, the fourth to hit Việt Nam this year, made landfall in the central region early this week.

Heavy rains caused flash flood and landslide in Nghệ An Province's Quỳnh Châu District, which borders Như Xuân District of Thanh Hóa Province, yesterday, killing two people from Thanh Hóa and one from Nghệ An while leaving five others missing. Two people from Quảng Bình Province reportedly died. Local authorities of the two provinces have mobilised all their forces to search for the missing people.

The Committee for Disaster Prevention and Control also reported that 90 houses were destroyed, 612 houses were damaged and 53 houses had their roofs blown away.

More than 1,700 houses and 11,655ha of rice were submerged, while thousands of trees had fallen.



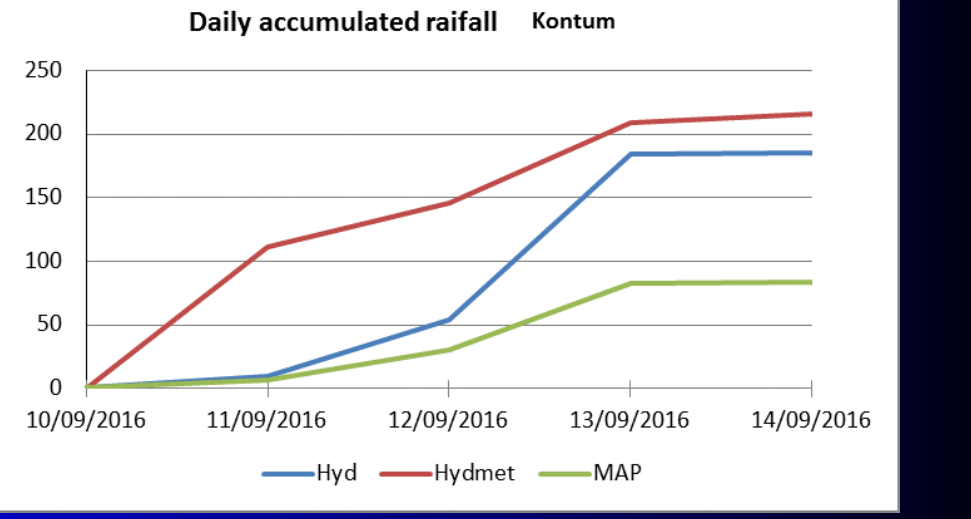
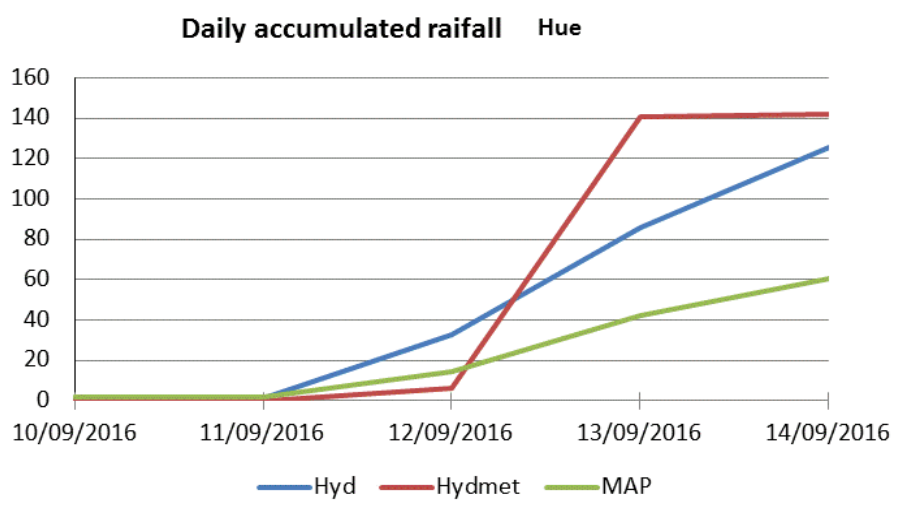
In addition, thousands of poultry and cattle had died due to flooding in the localities hit by the storm, while over 1,000ha of aquaculture farmland was damaged. Hundreds of kilometres of national and provincial highways were also damaged and 19 small bridges were destroyed.

Meanwhile, thousands of students in Hà Tĩnh and Nghệ An were kept home from schools due to floods.

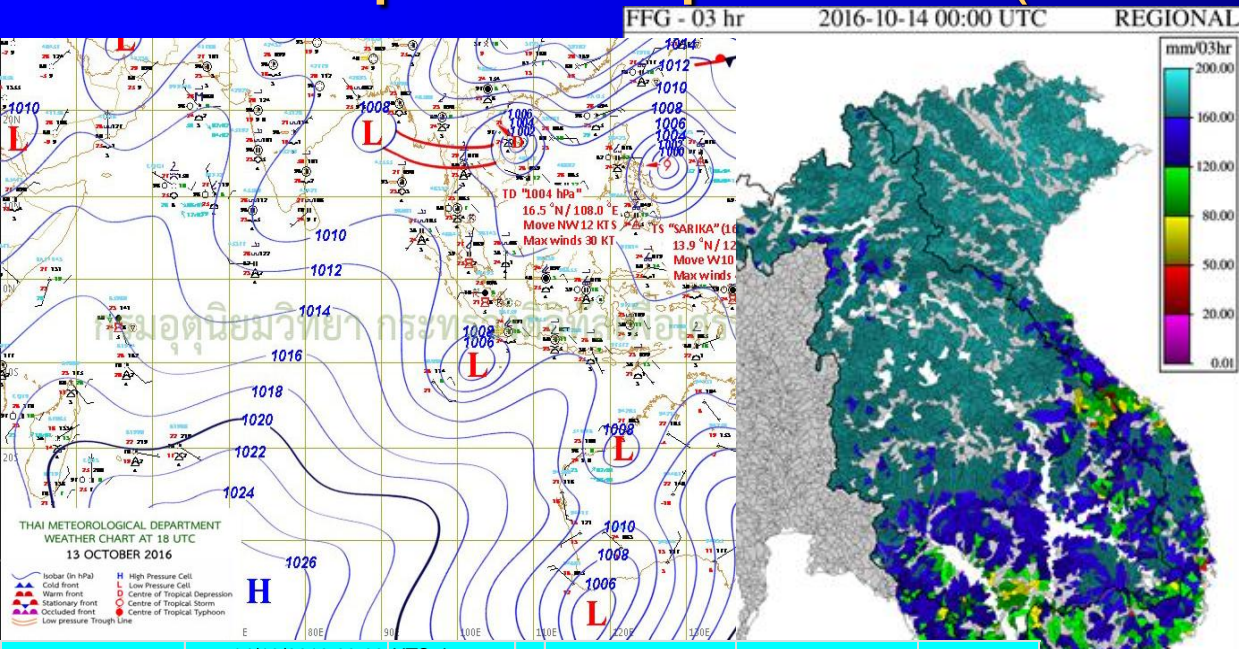
The committee has urged authorities of localities in the central region to take measures to deal with the aftermath of the storm.

The central localities have been requested to assess the damage caused by Storm Rai and mobilise forces to help people stabilise their lives. The Steering Committee also asked the provinces to undertake active measures to deal with the effects of Super Typhoon Meranti, which hit China's Taiwan yesterday and is forecast to land in Guangdong Province today.

Provinces from Nghệ An to Quảng Bình have been told to implement measures to deal with the rain and the floods caused by the typhoon and inspect the safety of lakes and dams, especially those under construction on rivers and streams in areas where heavy rainfall is expected. — VNS



Flash Flood in Central Viet Nam Tropical Depression(14-15 Oct 2016)



Devastating flood ravages central provinces

PANO - PANO - Saturday, October 15, 2016, 20:1 (GMT+7)

Torrential rains persisting from October 14 have devastated the central provinces of Nghe An, Ha Tinh, Quang Binh, Quang Tri and Thua Thien-Hue, causing heavy human and property losses.

In Nghe An, flood water swept away a 13-year-old student in Nam Dan district on October 15, while blocking many important transportation routes and kept thousands of school students in Vinh city and Hung Nguyen district home.

As many as 815 hectares of rice and over 5,200 hectares of crop have been submerged in flood.

Local authorities have been keeping a close eye on areas with high risk of landslide and are ready for search and rescue as well as evacuation of locals if necessary.

In Ha Tinh province reported one death of a 28-year-old local in Can Loc district.

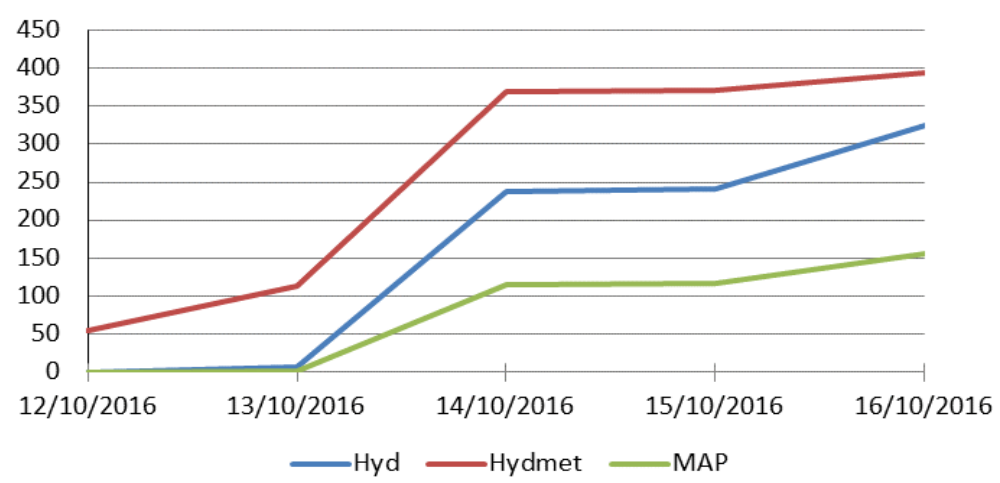


Many sections of the North-South railway have been affected by flood.

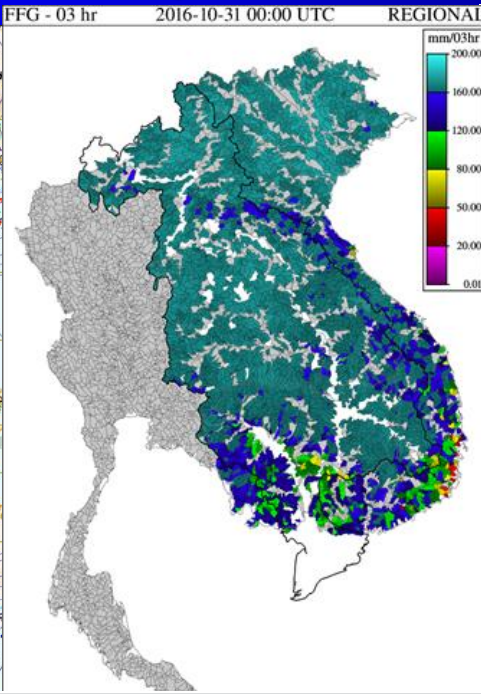
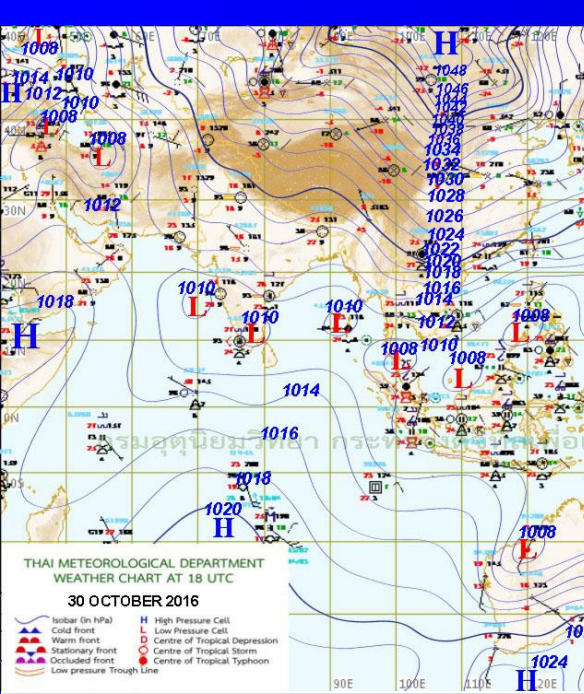
Rising water levels in Ngan Sau and Ngan Pho rivers and flood from hydropower reservoirs caused high risk of flash floods and landslides in districts, including Huong Khe, Huong Son, Vu Quang, Thach Ha, Cam

Date of FFG products 14/10/2016 00:00 UTC time			1hour Flash Flood Guidance in Vietnam		3hours Flash Flood Guidance in Vietnam	
Provinces	Districts	FFG value	Provinces	Districts	Provinces	Districts
Quang Tri	Da Krong	15.77	Quang Tri	Da Krong		
Thua Thien Hue	Phong Dien	15.77	Thua Thien Hue	Phong Dien		
Thua Thien Hue	Huong Tra	15.77	Thua Thien Hue	Huong Tra		
Thua Thien Hue	A Luoi	15.77	Thua Thien Hue	A Luoi		
			Phu Yen	Tuy Hoa		
			Phu Yen	Song Chinh		
			Khanh Hoa	Van Ninh		
			Khanh Hoa	Ninh Hoa		
			Dak Lak	Dak R'Lap		
			Dak Lak	Dak Nong		
			Lam Dong	Bao Lam		

Daily accumulated rainfall Hue



Flash Flood in Central Viet Nam Low Pressure (31 Oct-01 Nov 2016)



NATIONAL

Flood woes continue for central region

CENTRAL REGION — Severe floods are expected as the river water level continues to rise swiftly in the central Quảng Bình and Hà Tĩnh provinces, which were devastated by historic floods earlier this month.

Water from the floods in the beginning of the month has yet to drain in several remote areas in the provinces, resulting in repeated floods in the locality.

According to a report by commune authorities in Quảng Bình province's Ba Đồn District, the latest flood submerged residences yesterday morning. A dyke broke and locals attempted to reinforce it but failed, and floodwater from Gianh River poured into the commune again.

Nguyễn Văn Hóa, chairman of Quảng Hải Commune, said local authorities managed to evacuate residents of a village in the lowest-lying area in the district.

Flooding approximately one meter deep filled commune in Uyên Hóa and Bô Trạch districts. In Quảng Trạch, floods swept away floating bridge, isolating 1,000 residents in the district.

All schools in the flooded areas were shut down.

Railway authorities in the province deployed trucks to assist trains travelling through the flooded areas. Some trains were forced to travel at an average speed of 5km per hour.

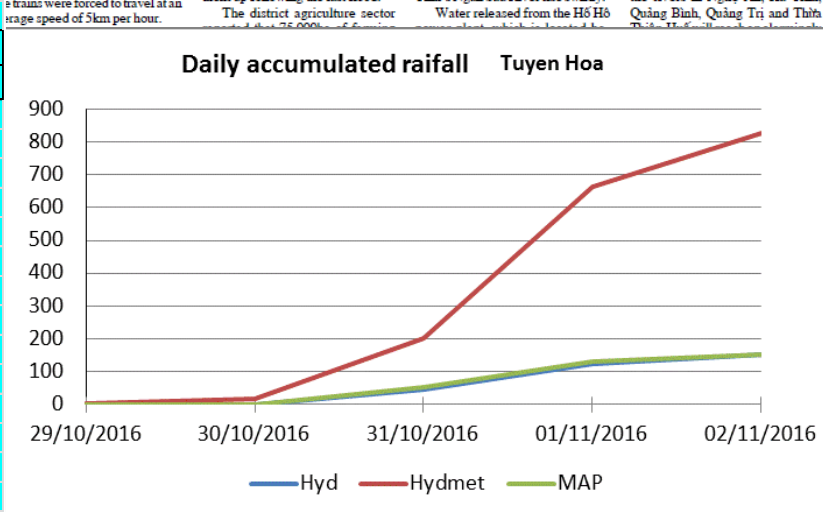
Đông Hải City in central Quảng Bình Province began flooding after mid-October's downpour. — VNA/VNS Photo Đức Thọ

Đông Hải City in central Quảng Bình Province began flooding after mid-October's downpour. — VNA/VNS Photo Đức Thọ

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Date of FFG products 31/10/2016 00:00 UTC time			Date of FFG products 31/10/2016 00:00 UTC time		
1hour Flash Flood Guidance in Vietnam			3hours Flash Flood Guidance in Vietnam		
Provinces	Districts	FFG value	Provinces	Districts	FFG Value
Phu Yen	Tuy Hoa	19.49	Phu Yen	Tuy Hoa	34.73
Khanh Hoa	Van Ninh	19.49	Phu Yen	Song Hinh	39.00
			Khanh Hoa	TP. Nha Trang	45.38
			Khanh Hoa	Van Ninh	30.26
			Khanh Hoa	Ninh Hoa	41.69
			Khanh Hoa	Dien Khanh	45.38
			Khanh Hoa	Cam Ranh	41.52
			Khanh Hoa	Khanh Son	43.10
			Ninh Thuan	Ninh Son	41.93
			Ninh Thuan	Ninh Hai	39.13
			Ninh Thuan	Ninh Phuoc	42.40
			Binh Thuan	Tuy Phong	36.25
			Binh Thuan	Ham Thuan Nam	33.41
			Binh Thuan	Tanh Linh	33.41



Challenges

Uncertainties of FFG system

- **Hydroestimator** some time are underestimate, and also the **MAP product** is underestimate cause of incorrect of **Bias correction factor**. It recommend to be review the **bias correction factor** for **MAP** .
- The **FFG product** should be **used** with accurate current or short-term **forecast rainfall (6-12 hours)** that will **provide a better** indicator for a flash flood **warning**. Currently the short – term rainfall forecast **not available** at RFMMC .
- Other **FFG model parameters** such as **Soil moisture , Land use /Land cover ...** **should be review**, as it may change from time to time.

Conclusion

- 4 Storms and 7-8 ITCZ and Low pressure has been occurred in LMB during the flood season 2016, which create a serious flash flood .
- The MRC FFG system was on time detected the flash flood risk areas during the sever weather condition in the flood season 2016, except few events (1-2).
- The failing detection flash flood risk areas by the MRC FFG System is caused by underestimate of satellite rainfall, and bias correction factor, which used to calculate MAP.
- Development of short-term forecast rainfall is necessary to help the FFG operator (priority the areas to monitor the flash flood) for improving the accuracies of FFG warning.
- Improvement of the FFG processing tool by updated the GIS provincial administration database.

Conclusion(continue)

- Maintaining the **connection between the RFMMC and National FFG** operators for the region in order to receive additional **feed-back** for those areas where **flash floods occurred**.
- According to the information from the newspaper, the flood has been occurred also in many districts/villages under flash flood risk level 2 (yellow color scale). This is recommend that **MRCFFG operator should also provide the flash flood watch** list for districts/villages, which are under the **risk level 2 (yellow color scale)**.
- Conducted **refreshment training** course of FFG system operation in purpose **to improve and exchange** the knowledge and experiences on FFG operation with national FFG system operators.

Thank for your attention

Question	Answer
1. Has there been any rainfall? a. If yes then where(station name;lat;long), how much and when?	
2. What type of system is prevailing?	
3. How is the system progressing? Weakening/Strengthening	
4. Does this system have the potential for more rain?	
5. Images	
6. Remarks	

Downtime of FFG system in 2016

From	To	Root cause
09-05-2016	16-05-2016	Hardware failure
21-08-2016	22-08-2016	Hardware failure
02-09-2016	03-09-2019	The uploads of GHE satellite input to the FTP server from which MRCFFG downloads the files was interrupted.