



# Central Asia Regional Flash Flood Guidance System: Introduction to FFGS Interface

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CARFFG Planning Meeting

05-07 MAY 2015

Ankara, TURKEY

# Flash Flood Guidance System Forecaster Interface

FFGS forecaster interface was designed to provide visual overview of current (and historical) system products. [Example of the BSMEFFG System]

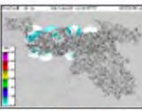
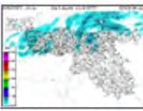
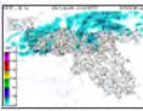
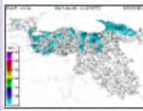
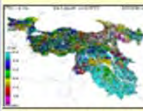
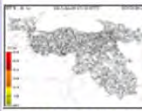
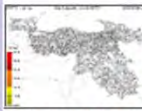
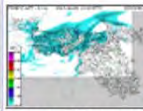
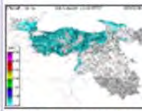

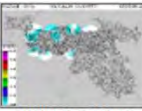
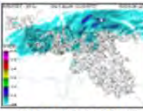
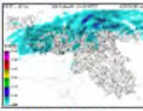
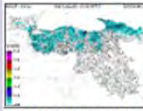
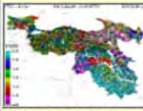
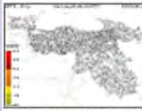
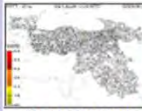
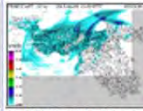
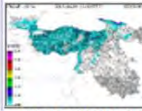
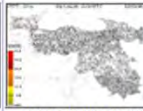
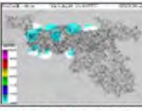
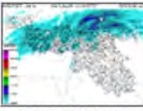
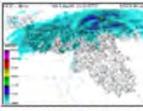
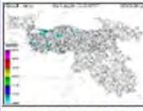
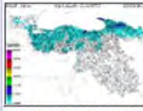
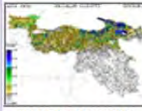
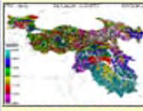
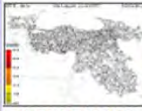

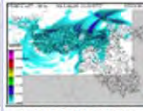
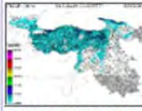

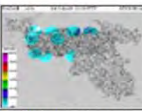
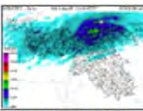
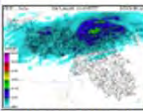
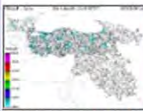
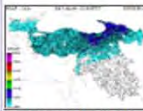
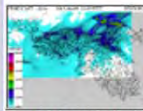
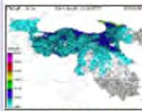
## BSMEFFG - Black Sea Middle East Flash Flood Guidance System

Current Date: 2015-04-28 18:56 UTC      Nav Date: 2015-04-09 12:00 UTC

Year: 2015   Month: 04   Day: 09   Hour: 12   REGION: REGIONAL   Submit

-1 Month   -1 Day   -6 Hours   -1 Hour   +1 Hour   +6 Hours   +1 Day   +1 Month

Prev 6-hr Interval (06 UTC)   Reset to Current   Next 6-hr Interval (18 UTC)

DT	RADAR Precipitation	MWGHE Precipitation	GHE Precipitation	Gauge MAP	Merged MAP	ASM	FFG	IFFT	PFFT	ALADIN Forecast	FMAP	FFFT
01-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 07:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>
03-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 09:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>
06-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>
24-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>					 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	

Composite Product: [text](#), [CSV](#), [CSV/T](#)

SFTP data transfer (requires SFTP Client): [EXPORTS REGIONAL/2015/04/09](#)

Surfmet Gauge Observations at 2015-04-09 12:00 UTC

Station Identification	Station Name	Accumulated Precipitation (mm/06hr)	Average Temperature (C)	Snow Depth (cm)	Snow Cover (Index)	Region	Latitude	Longitude	Elevation	Enable Precipitation Flag	Enable Temperature Flag
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# Flash Flood Guidance System Forecaster Interface

Primary Products: Merged MAP, ASM, FFG, if available FMAP

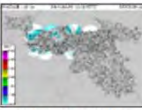
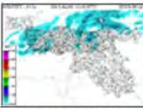
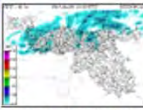
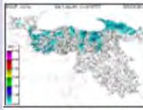
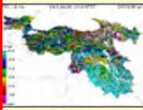


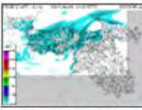
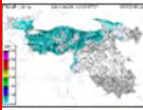
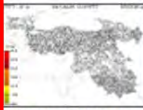

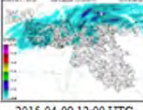
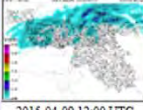
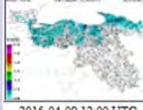
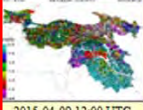



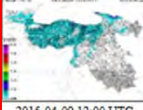
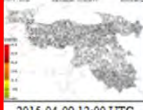
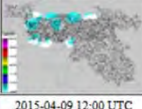
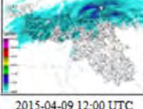
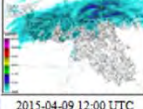
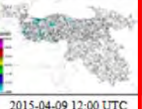
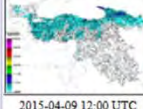
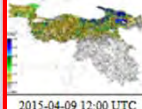




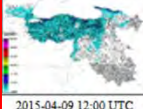
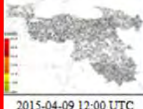
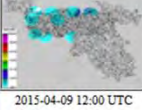
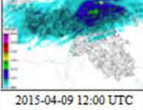
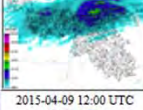
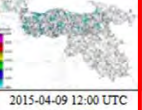
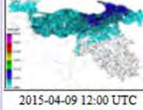
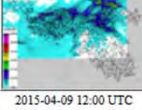
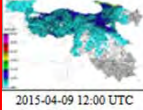
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03-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 09:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>
06-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>
24-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>					 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	

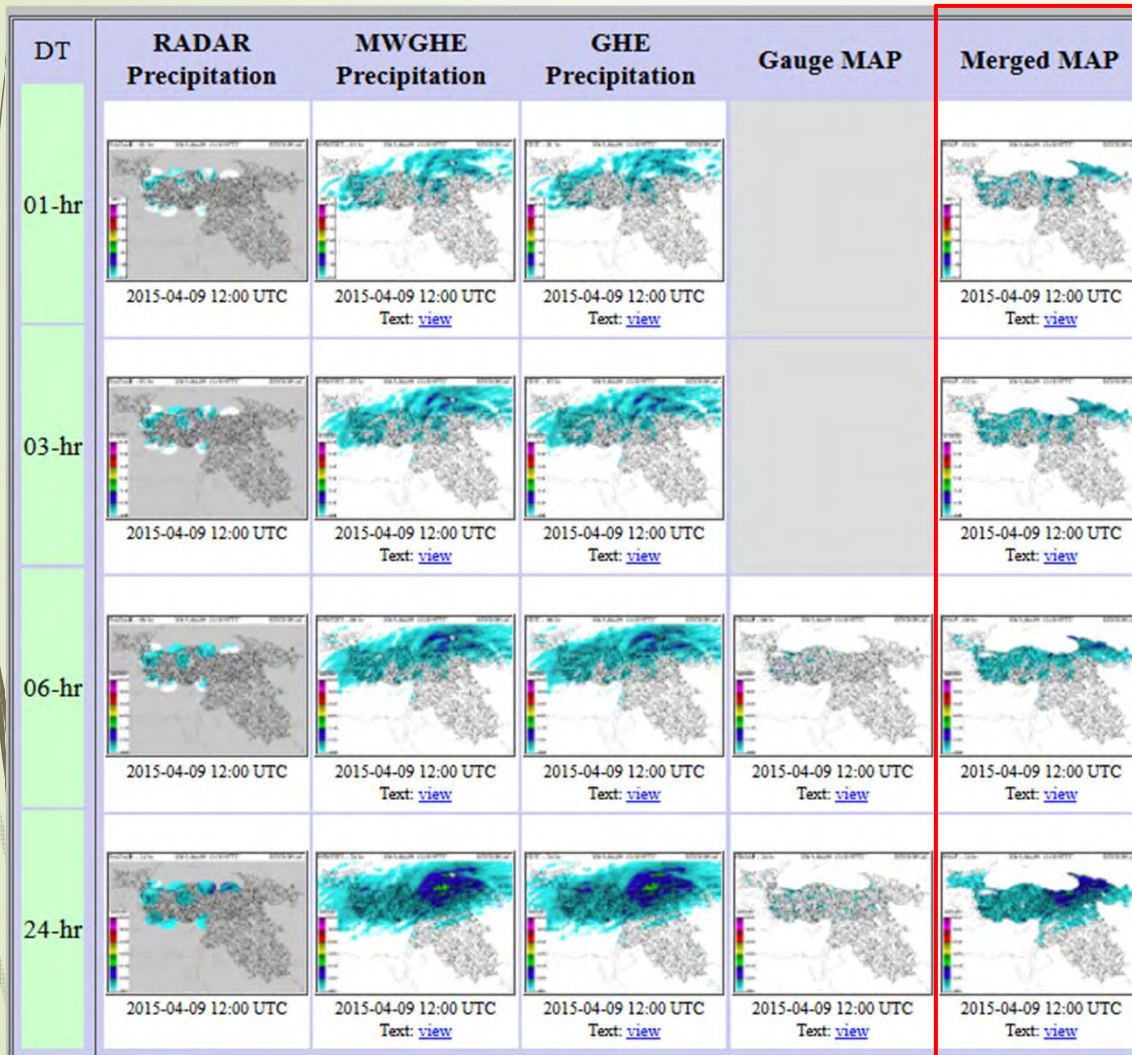
Composite Product: [text](#), [CSV](#), [CSVt](#)

SFTP data transfer (requires SFTP Client): [EXPORTS REGIONAL/2015/04/09](#)

Surfmet Gauge Observations at 2015-04-09 12:00 UTC

Station Identifier   Station Name   Accumulated Precipitation (mm/06hr)   Average Temperature (C)   Snow Depth (cm)   Snow Cover (Index)   Region   Latitude   Longitude   Elevation   Enable Precipitation Flag   Enable Temperature Flag

# Merged MAP



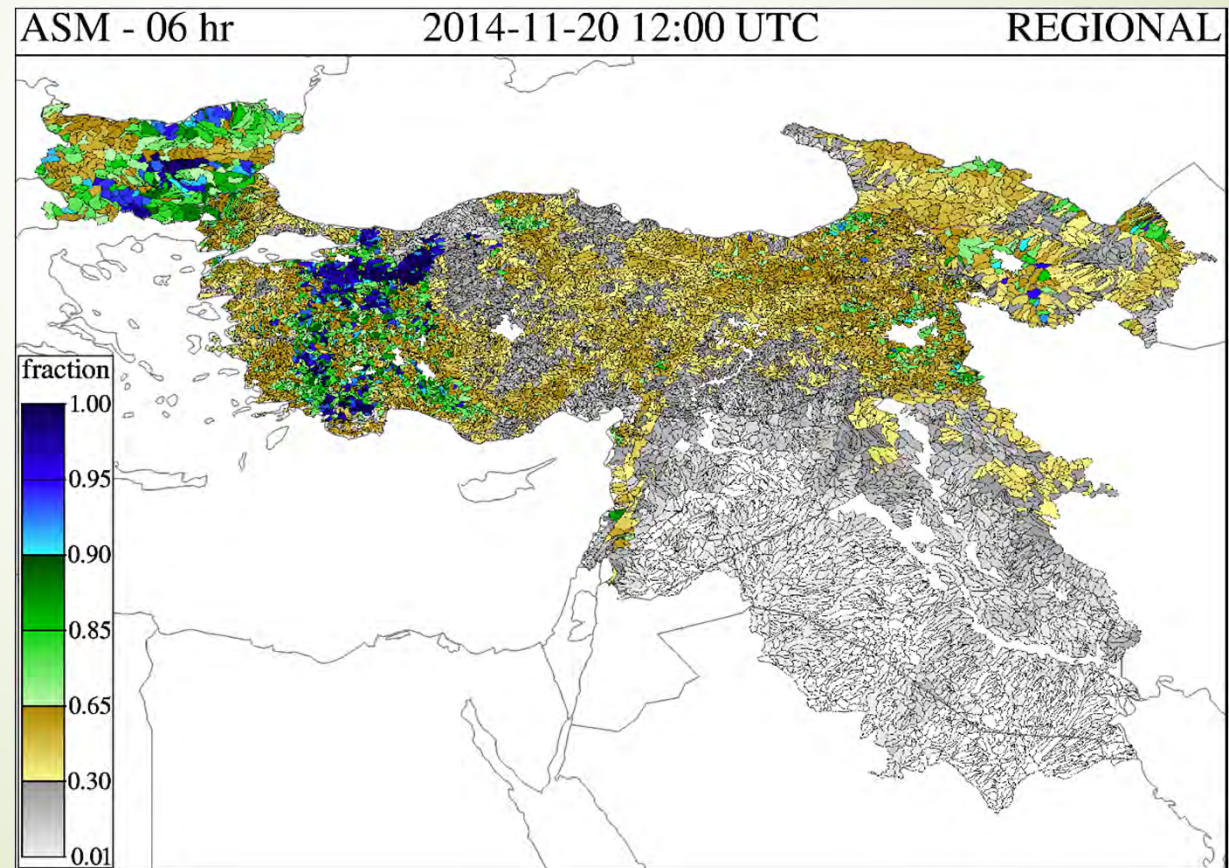
Merged MAP is the *best estimate* of Mean Areal Precipitation over each small watershed for previous 1-, 3-, 6- and 24- hour periods.

- Satellite
- Real-time gauges
- Radar (if available)



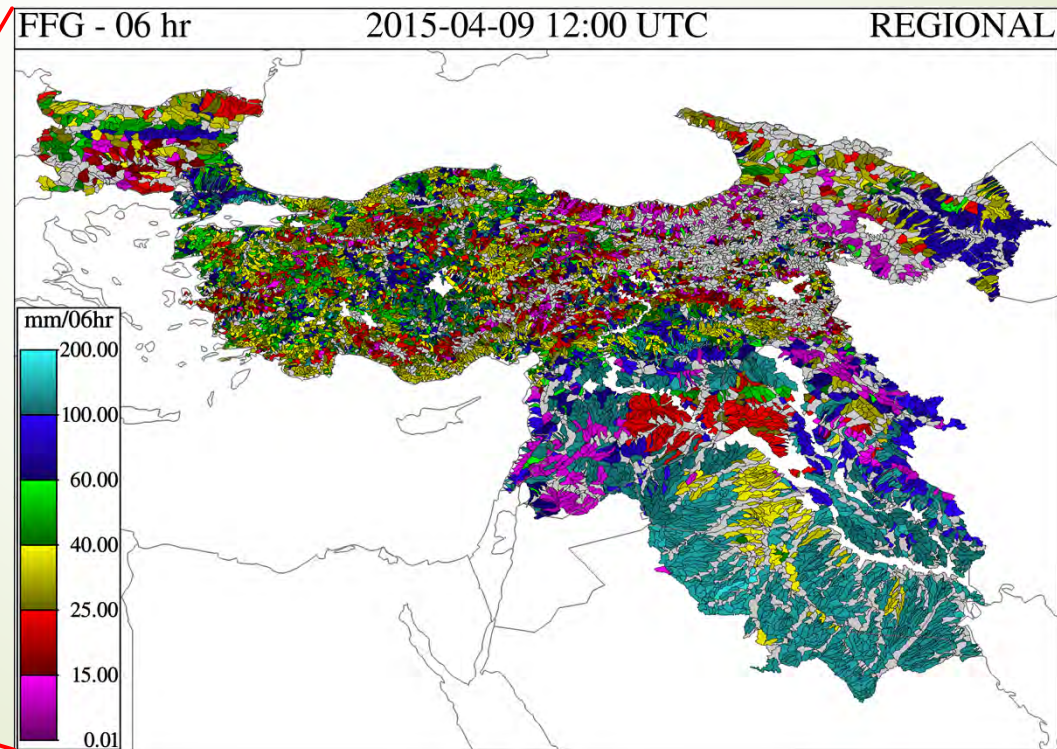
# ASM

Average Soil Moisture (ASM) product provides an estimate of current soil water in the upper soil depth, expressed as a fraction of saturation. ASM reflects history of prior precipitation. The upper soil depth is most indicative for flash flood production.



# FFG

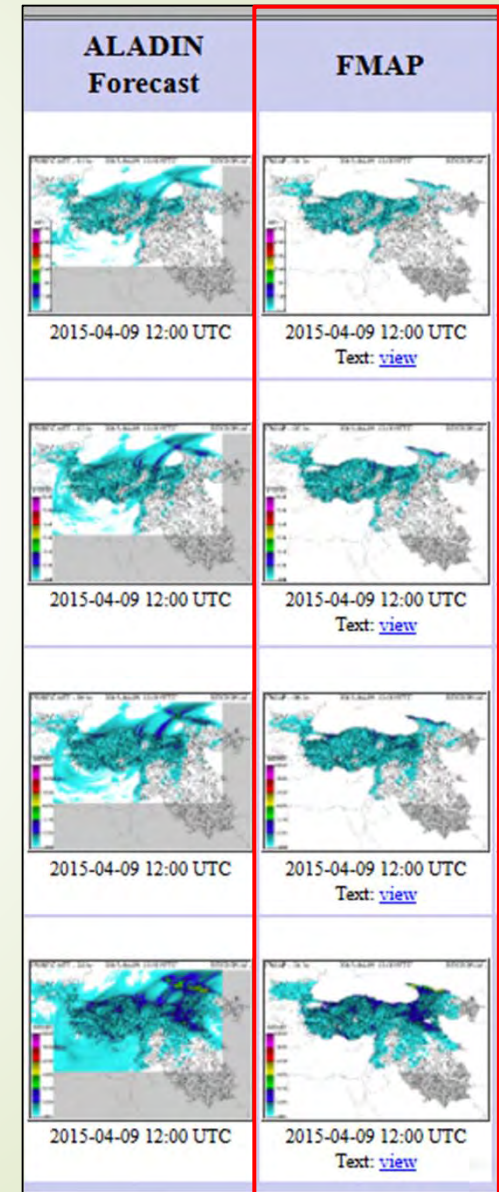
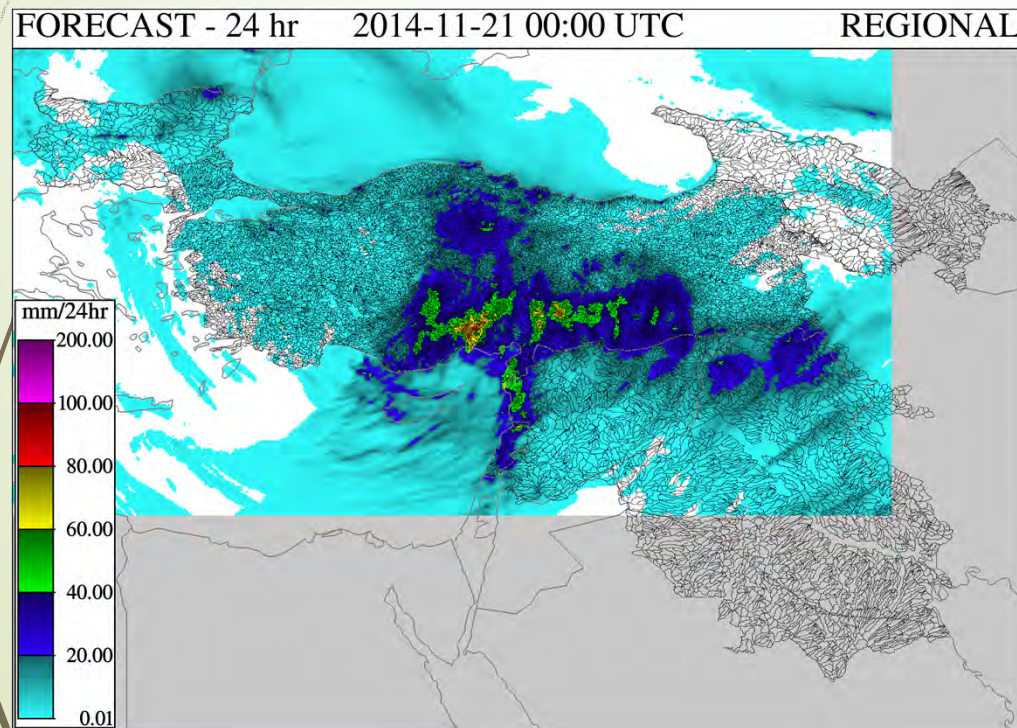
Flash Flood Guidance (FFG) is an estimate of the amount of rainfall of a given duration over a given small watershed which is enough to produce bankfull flow in the stream channel at the outlet of the watershed. The system interface provides current FFG values for durations of 1-, 3-, and 6-hours.





# FMAP

If a forecast precipitation product is available, the system ingests forecast precipitation estimates to calculate forecast MAP (FMAP) for each small watershed for forecast lead times of 1-, 3-, 6-, and 24-hours.





# Flash Flood Guidance System Forecaster Interface

## Informational Products: Flash Flood Threat Products

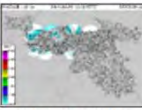
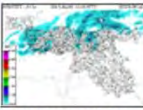
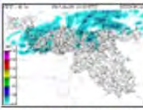
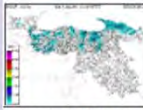
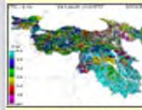
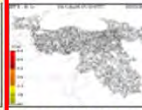
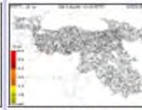
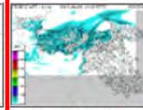
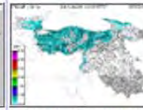
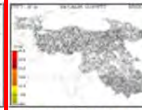

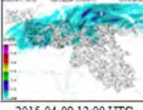
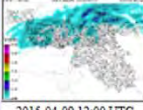
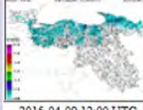
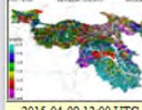


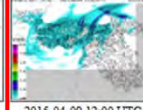
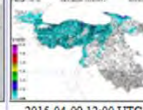
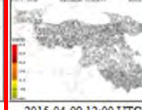
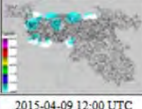
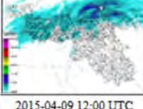
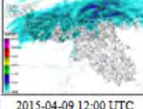
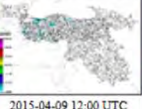
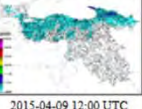
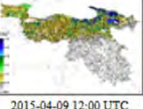


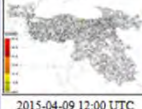
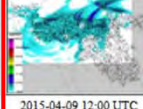
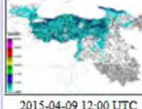
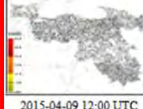
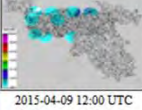
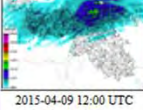
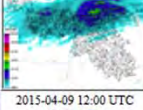
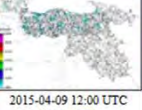
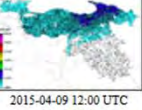
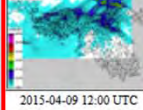
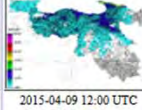
### BSMEFFG - Black Sea Middle East Flash Flood Guidance System

Current Date: 2015-04-28 18:56 UTC      Nav Date: 2015-04-09 12:00 UTC

Year: 2015   Month: 04   Day: 09   Hour: 12   REGION: REGIONAL   Submit

-1 Month   -1 Day   -6 Hours   -1 Hour   +1 Hour   +6 Hours   +1 Day   +1 Month

Prev 6-hr Interval (06 UTC)   Reset to Current   Next 6-hr Interval (18 UTC)

DT	RADAR Precipitation	MWGHE Precipitation	GHE Precipitation	Gauge MAP	Merged MAP	ASM	FFG	IFFT	PFFT	ALADIN Forecast	FMAP	FFFT
01-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 07:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>
03-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>		 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 09:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>
06-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>
24-hr	 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	 2015-04-09 12:00 UTC <a href="#">Text: view</a>					 2015-04-09 12:00 UTC	 2015-04-09 12:00 UTC <a href="#">Text: view</a>	

Composite Product: [text](#), [CSV](#), [CSVt](#)

SFTP data transfer (requires SFTP Client): [EXPORTS REGIONAL/2015/04/09](#)

#### Surfmet Gauge Observations at 2015-04-09 12:00 UTC

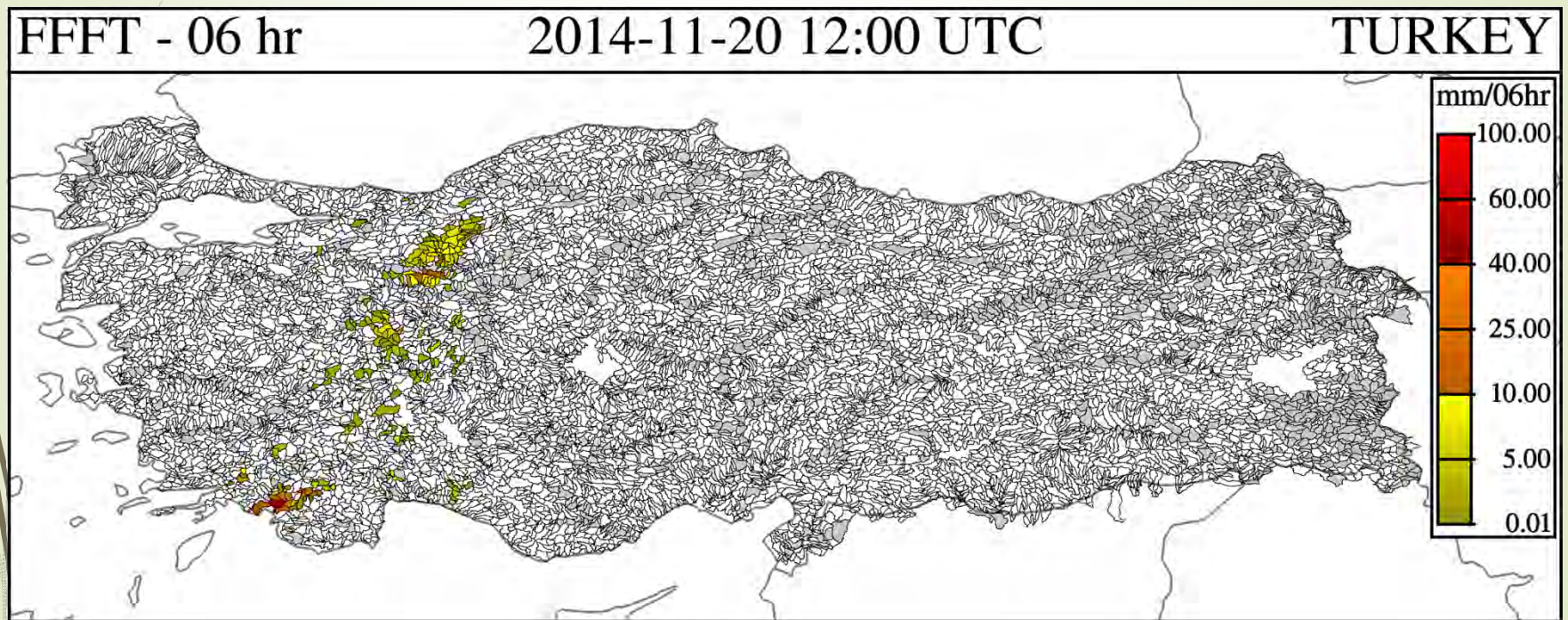
Station Identifier	Station Name	Accumulated Precipitation (mm/06hr)	Average Temperature (C)	Snow Depth (cm)	Snow Cover (Index)	Region	Latitude	Longitude	Elevation	Enable Precipitation Flag	Enable Temperature Flag
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## Flash Flood Threat (FFT) Products

Flash Flood Threat (FFT) products indicate the watersheds where precipitation exceeds the Flash Flood Guidance (FFG) value, based on observed, persisted, or forecast precipitation.

FFTs indicate watersheds where the potential for flash flooding is increased.



*FFT products are **\*not\*** intended to be a forecast. Rather it serves as indicator of regions of potential concern. The role of operational forecasters in evaluating the current situation (observed and forecast precipitation) in these regions is **critical**.*

# Flash Flood Guidance System Forecaster Interface

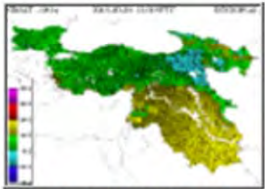

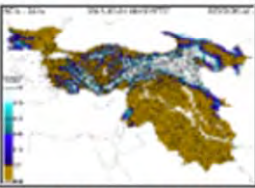
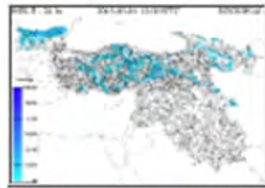
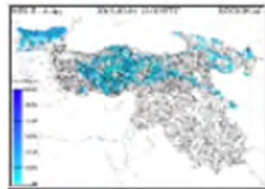
## Informational Products: Snow Products

## Observations

- (1) Gauge MAT  
based on real-time temperature stations
- (2) IMS Snow Cover  
satellite observation of snow extent (daily)

## Model Output

- (3) SWE  
model estimated Snow Water Equivalent
- (4) Snow Melt  
melt from snow pack; this contributes to soil water model

Snowpack Products				
DT	Gauge MAT	Latest IMS SCA	SWE	Melt
06-hr	 <p>2015-03-01 12:00 UTC Text: <a href="#">view</a></p>		 <p>2015-03-01 12:00 UTC Text: <a href="#">view</a></p>	
24-hr		 <p>2015-03-01 00:00 UTC Text: <a href="#">view</a></p>		 <p>2015-03-01 12:00 UTC Text: <a href="#">view</a></p>
4-day				 <p>2015-03-01 12:00 UTC Text: <a href="#">view</a></p>



# Flash Flood Guidance System Forecaster Interface

## Informational Products: Real-time gauge data

Composite Product: [text](#), [CSV](#), [CSV T](#) SFTP data transfer (requires SFTP Client): [EXPORTS/REGIONAL/2015/04/09](#)

**Surfmet Gauge Observations at 2015-04-09 12:00 UTC**

Station Identifier	Station Name	Accumulated Precipitation (mm/06hr)	Average Temperature (C)	Snow Depth (cm)	Snow Cover (Index)	Region	Latitude	Longitude	Elevation	Enable Precipitation Flag	Enable Temperature Flag
15502	Vidin	0.00	14.40	No Report	No Report	BULGARIA	43.9942	22.8525	31	Enabled	Enabled
15525	Lovech	0.00	8.50	No Report	No Report	BULGARIA	43.1631	24.7006	220	Enabled	Enabled
15549	Razgrad	0.10	7.35	No Report	No Report	BULGARIA	43.5661	26.5078	346	Enabled	Enabled
15552	Varna	0.00	11.60	No Report	No Report	BULGARIA	43.2125	27.9522	39	Enabled	Enabled
15600	Murgash	0.10	-3.85	50.00	8.00	BULGARIA	42.8333	23.6683	1687	Enabled	Enabled
15614	Sofia	0.00	7.60	No Report	No Report	BULGARIA	42.6553	23.3847	586	Enabled	Enabled
15615	Musala	8.00	-12.20	No Report	No Report	BULGARIA	42.1797	23.5866	2925	Enabled	Enabled

**BSMEFFG - Black Sea Middle East Flash Flood Guidance System**

Current Date: 2015-04-28 19:20 UTC Nav Date: 2015-04-09 12:00 UTC

[Return to Main](#)

Station Identifier	15615
Station Name	Musala
Region	BULGARIA
Latitude	42.1797
Longitude	23.5866
Elevation (m)	2925
Agency	Bulgaria
Type	SYNOP
Precipitation Enabled Flag	Enabled
Temperature Enabled Flag	Enabled

**Reported Surfmet Gauge Observations from Station '15615' within the past 30 days**

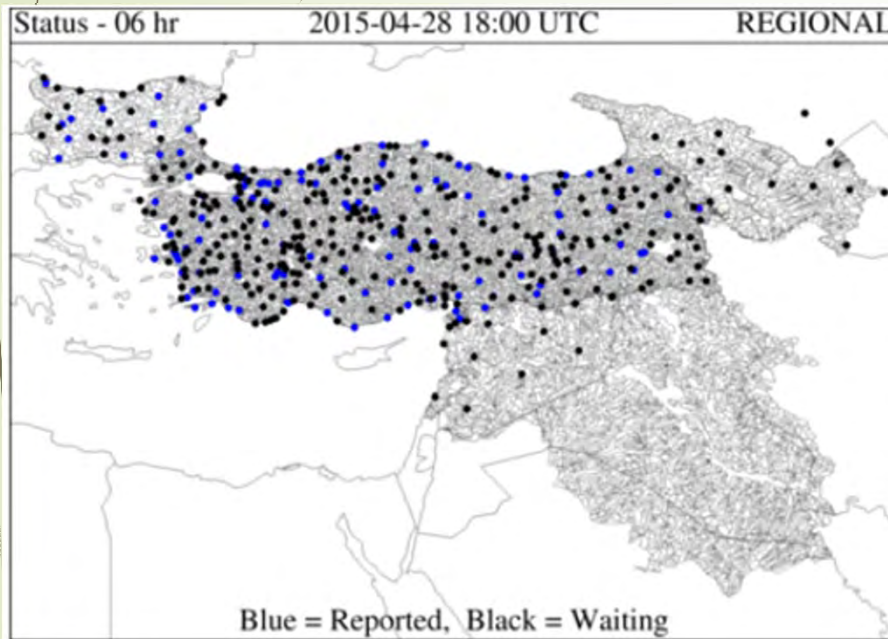
Station Identifier	Observation Date & Time	Precipitation (mm/06hr)	Temperature (C)	Snow Depth (cm)	Snow Cover (Index)
15615	2015-04-09 12:00:00+00	8.00	-12.20	No Data	No Data
15615	2015-04-09 06:00:00+00	9.00	-13.65	999.00	9.00
15615	2015-04-09 00:00:00+00	3.00	-14.25	No Data	No Data
15615	2015-04-08 18:00:00+00	8.00	-13.95	No Data	No Data
15615	2015-04-08 12:00:00+00	6.00	-12.20	No Data	No Data
15615	2015-04-08 06:00:00+00	12.00	-15.50	999.00	9.00
15615	2015-04-08 00:00:00+00	7.00	-13.55	No Data	No Data
15615	2015-04-07 18:00:00+00	8.00	-12.25	No Data	No Data
15615	2015-04-07 12:00:00+00	4.00	-11.95	No Data	No Data
15615	2015-04-07 06:00:00+00	0.00	-14.05	999.00	9.00
15615	2015-04-07 00:00:00+00	0.00	-14.30	No Data	No Data
15615	2015-04-06 18:00:00+00	0.00	-9.70	No Data	No Data
15615	2015-04-06 12:00:00+00	0.20	-6.60	No Data	No Data
15615	2015-04-06 06:00:00+00	5.00	-6.80	999.00	9.00
15615	2015-04-06 00:00:00+00	4.00	-6.95	No Data	No Data
15615	2015-04-05 18:00:00+00	5.00	-7.50	No Data	No Data
15615	2015-04-05 12:00:00+00	2.00	-6.85	No Data	No Data

- Real-time gauge report are critically important for:
- gauge MAP product
  - real-time temperature (MAT)
  - dynamic precipitation bias adjustment

# Real-Time Gauge Status

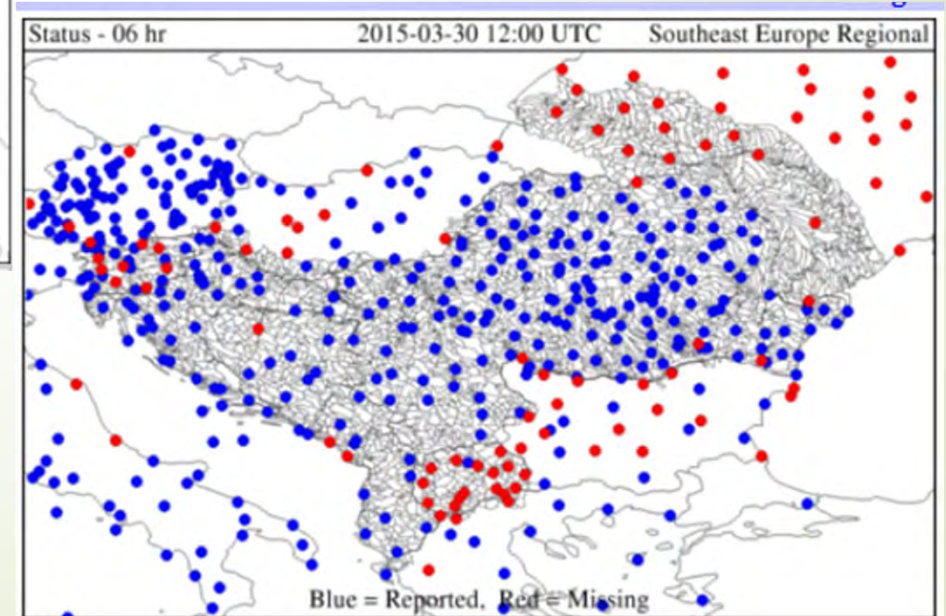
System reports on status of real-time gauge data acquisition.

## Example from Black Sea Middle East



*Gauge data is from GTS plus country-provided in format that can be readily ingested by System.*

## Example from Southeast Europe



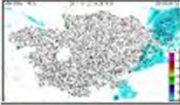
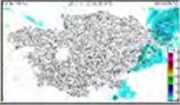



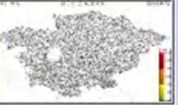
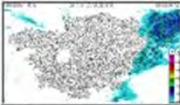
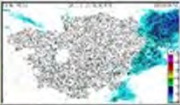
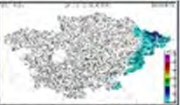



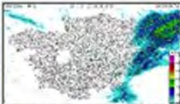
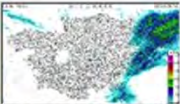

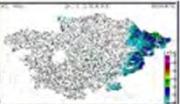
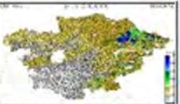


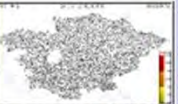
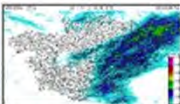
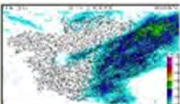

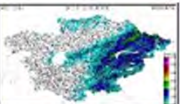
*We will discuss real-time data needs during this workshop.*



# Preliminary Forecaster Interface Design for CARFFG System

## CAsia-FFG - Central Asia Flash Flood Guidance System

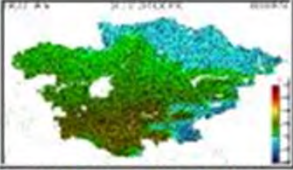
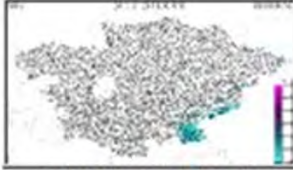
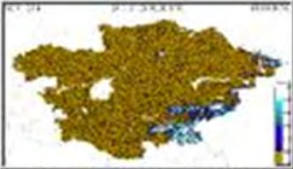
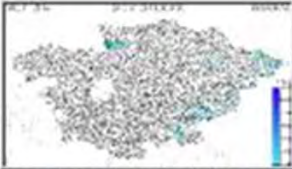
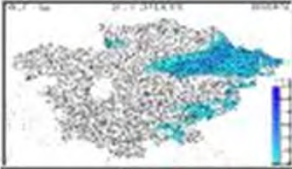
Current Date: 2015-04-28 20:22 UTC      Nav Date: 2015-04-27 01:00 UTC  
 Year: 2015   Month: 04   Day: 27   Hour: 01   REGION: REGIONAL   Submit  
 -1 Month   -1 Day   -6 Hours   -1 Hour   +1 Hour   +6 Hours   +1 Day   +1 Month  
 Prev 6-hr Interval (00 UTC)   Reset to Current   Next 6-hr Interval (06 UTC)

DT	MWGHE Precipitation	GHE Precipitation	Gauge MAP	Merged MAP	ASM	FFG	IFFT	PFFT
01-hr	 2015-04-27 01:00 UTC <a href="#">Text: view</a>	 2015-04-27 01:00 UTC <a href="#">Text: view</a>		 2015-04-27 01:00 UTC <a href="#">Text: view</a>		 2015-04-27 00:00 UTC <a href="#">Text: view</a>	 2015-04-27 01:00 UTC <a href="#">Text: view</a>	 2015-04-27 00:00 UTC <a href="#">Text: view</a>
03-hr	 2015-04-27 01:00 UTC <a href="#">Text: view</a>	 2015-04-27 01:00 UTC <a href="#">Text: view</a>		 2015-04-27 01:00 UTC <a href="#">Text: view</a>		 2015-04-27 00:00 UTC <a href="#">Text: view</a>	 2015-04-26 21:00 UTC <a href="#">Text: view</a>	 2015-04-27 00:00 UTC <a href="#">Text: view</a>
06-hr	 2015-04-27 01:00 UTC <a href="#">Text: view</a>	 2015-04-27 01:00 UTC <a href="#">Text: view</a>	 2015-04-27 00:00 UTC <a href="#">Text: view</a>	 2015-04-27 01:00 UTC <a href="#">Text: view</a>	 2015-04-27 00:00 UTC <a href="#">Text: view</a>	 2015-04-27 00:00 UTC <a href="#">Text: view</a>	 2015-04-27 00:00 UTC <a href="#">Text: view</a>	 2015-04-27 00:00 UTC <a href="#">Text: view</a>
24-hr	 2015-04-27 01:00 UTC <a href="#">Text: view</a>	 2015-04-27 01:00 UTC <a href="#">Text: view</a>	 2015-04-27 00:00 UTC <a href="#">Text: view</a>	 2015-04-27 01:00 UTC <a href="#">Text: view</a>				

Composite Product: [text](#), [CSV](#), [CSV1](#)

SFTP data transfer (requires SFTP Client): [EXPORTS/REGIONAL/2015/04/27](#)

# Preliminary Forecaster Interface Design for CARFFG System

Snowpack Products				
DT	Gauge MAT	Latest IMS SCA	SWE	Melt
06-hr	 2015-04-28 18:00 UTC Text: <a href="#">view</a>		 2015-04-28 18:00 UTC Text: <a href="#">view</a>	
24-hr		 2015-04-28 00:00 UTC Text: <a href="#">view</a>		 2015-04-28 18:00 UTC Text: <a href="#">view</a>
4-day				 2015-04-28 18:00 UTC Text: <a href="#">view</a>



# Introduction to FFGS Forecaster Interface for CARFFG System

**THANK YOU**  
**for your kind attention**