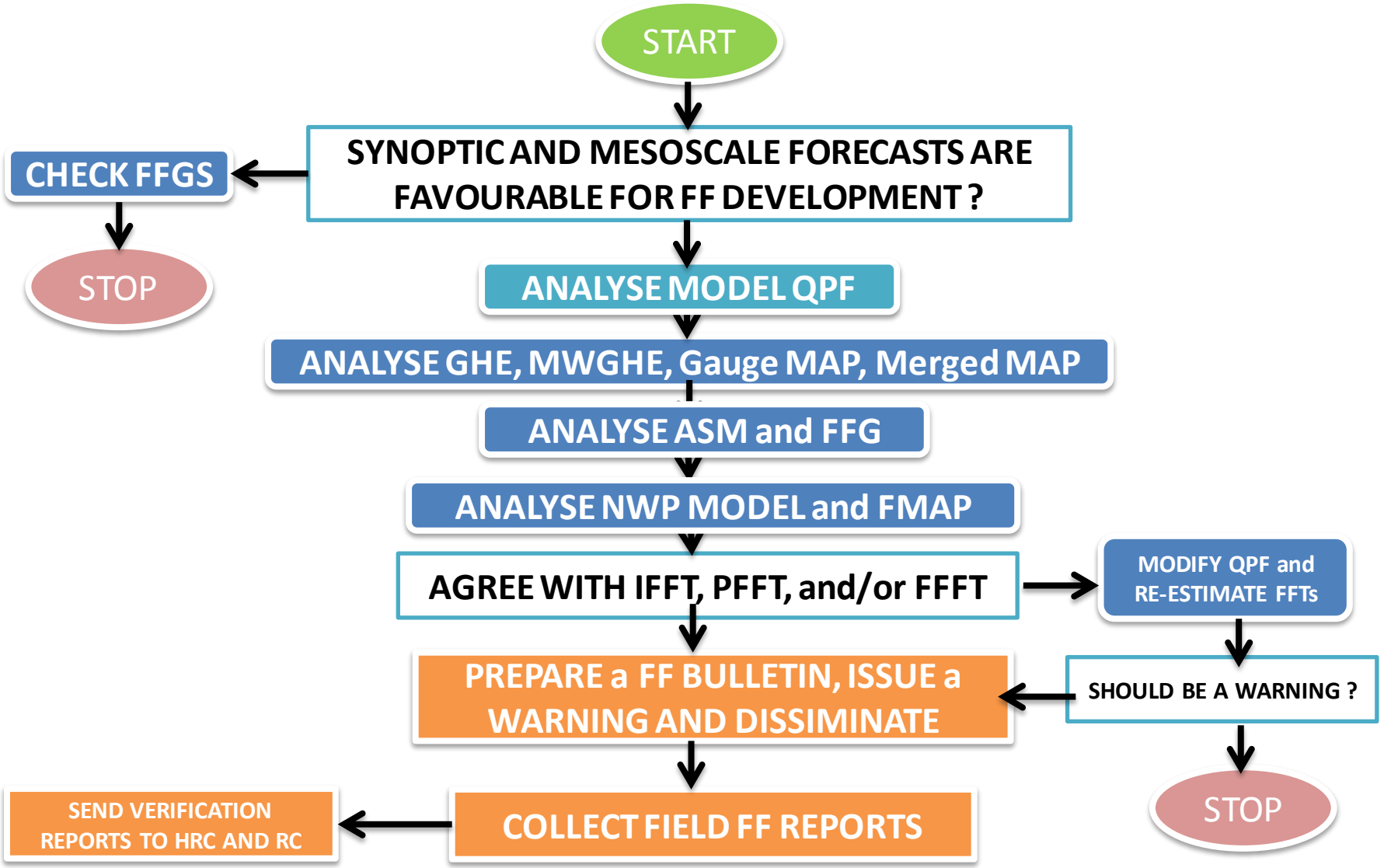
WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Guidance for Preparation of Flash Flood Warnings

WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

FFGS Flash Flood Analysis Flowchart



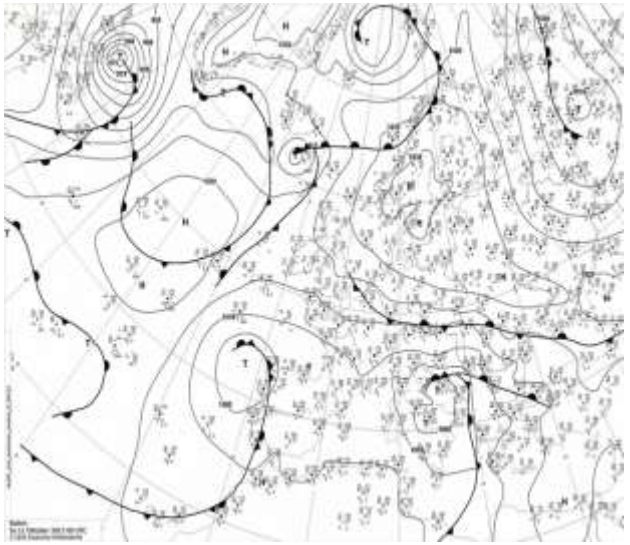
Guidance for Preparation of Flash Flood Warnings

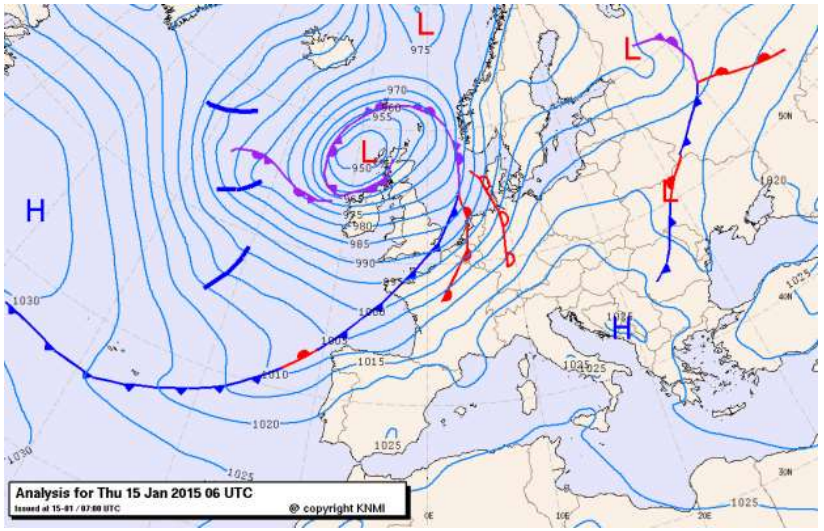
- In flash flood forecasting, forecasters should use all available tools to better understand weather situation in particular region, use locale knowledge and experience, and current situation from field.
- As usual, forecasters should first do synoptic scale analysis, mesoscale analysis and finally small scale analysis, and interpretation of FFGS products.
- As part of nowcast process forecasters should use satellite images, radar products and information from station.
- It is very important to take in consideration past weather events (few days) so one can get better images about soil moisture and stage of rivers.
- Also, flash floods can cause two different types of weather: big frontal system with heavy and steady rain and convective heavy rain with fast development.

Synoptic Analysis

- **Synoptic Analysis should contain:**

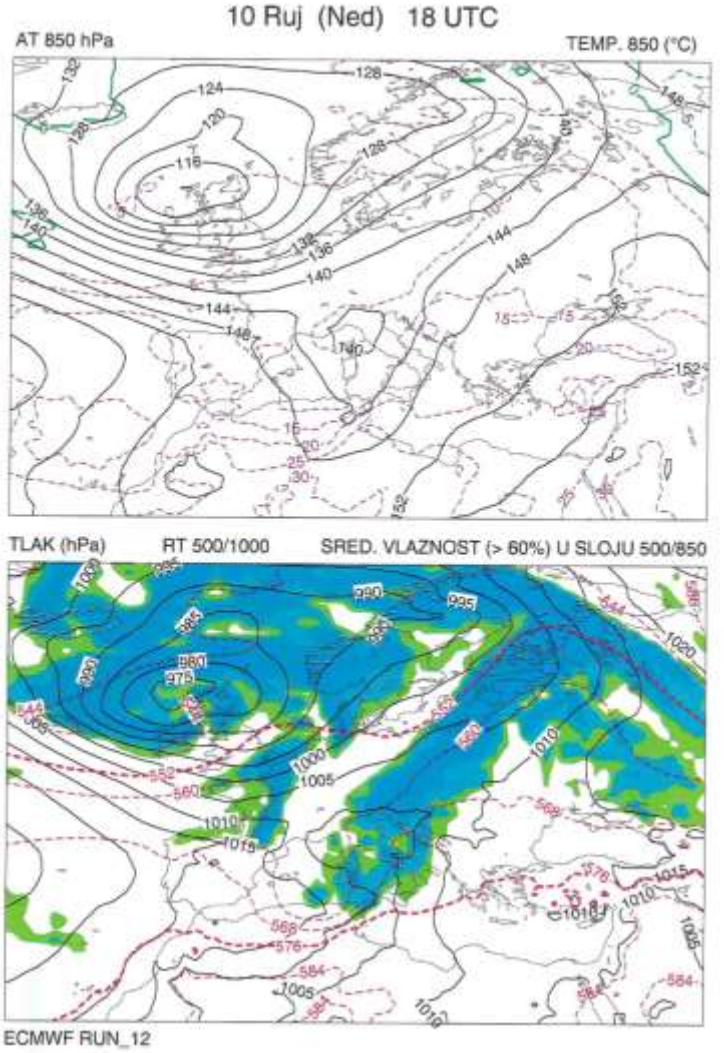
- **Surface analysis:**
  - Current weather
  - Low pressure systems and frontal systems and their movement in time
  - Winds
  - Precipitation types and amounts

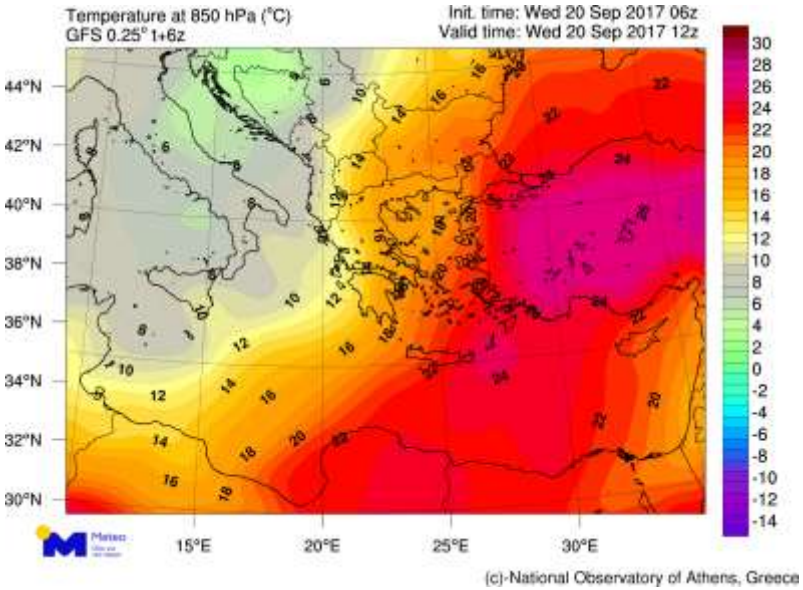




Synoptic Analysis

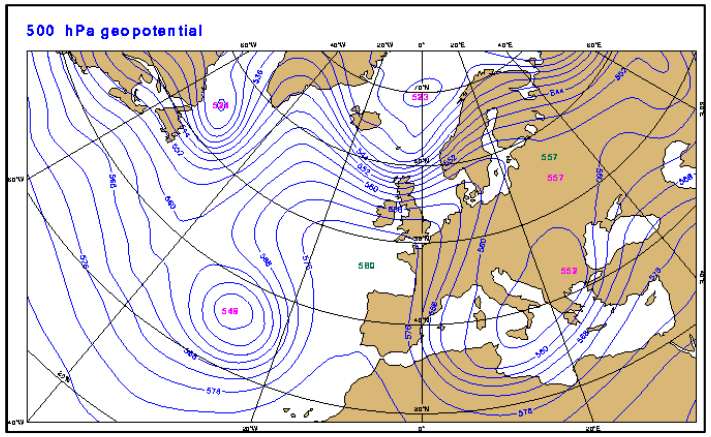
- **850 hPa analysis:**
  - Trough and ridges
  - Warm and cold air advection
  - Low level convergence
  - Wind
  - Humidity

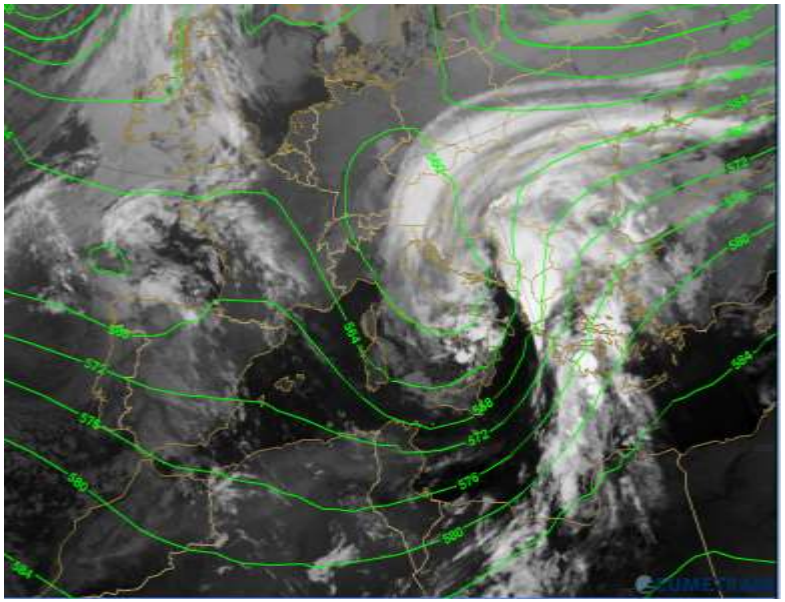


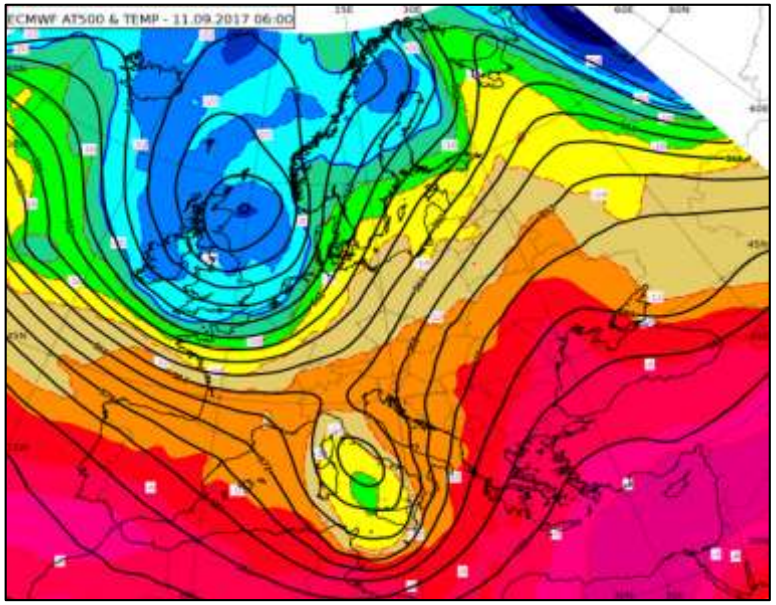


Synoptic Analysis

- **500 hPa analysis:**
  - Trough and ridges
  - Warm and cold air advection
  - Convergence and divergence areas
  - Wind
  - Vertical motions

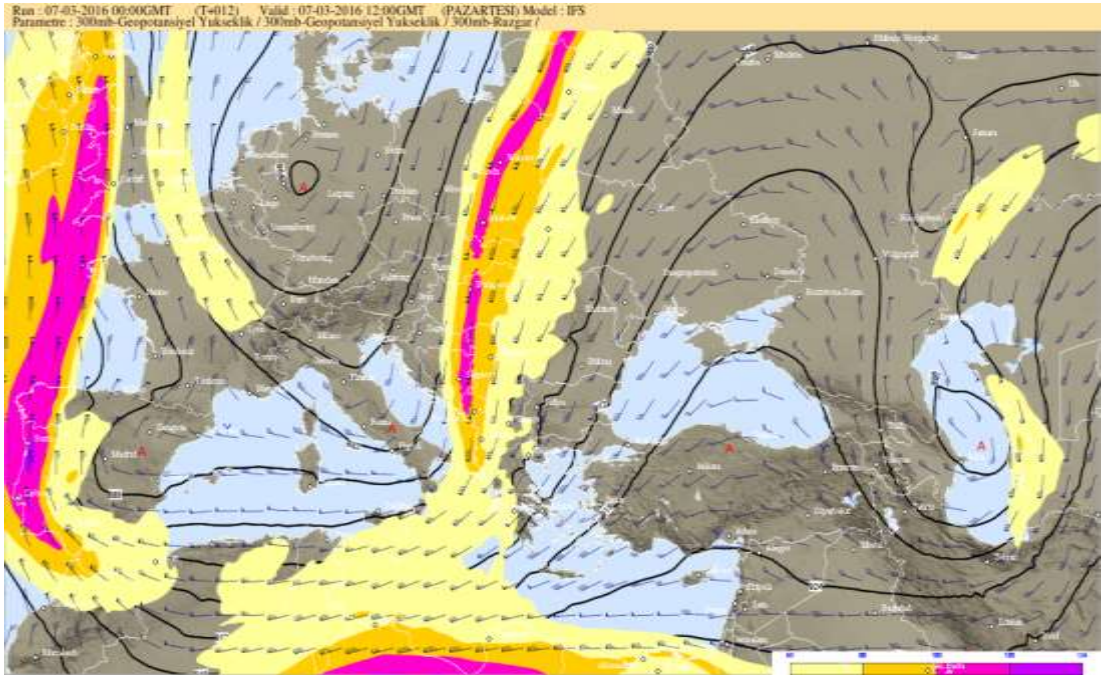






Synoptic Analysis

- JET stream locations and movement in time
- Satellite images
- Various LAM models

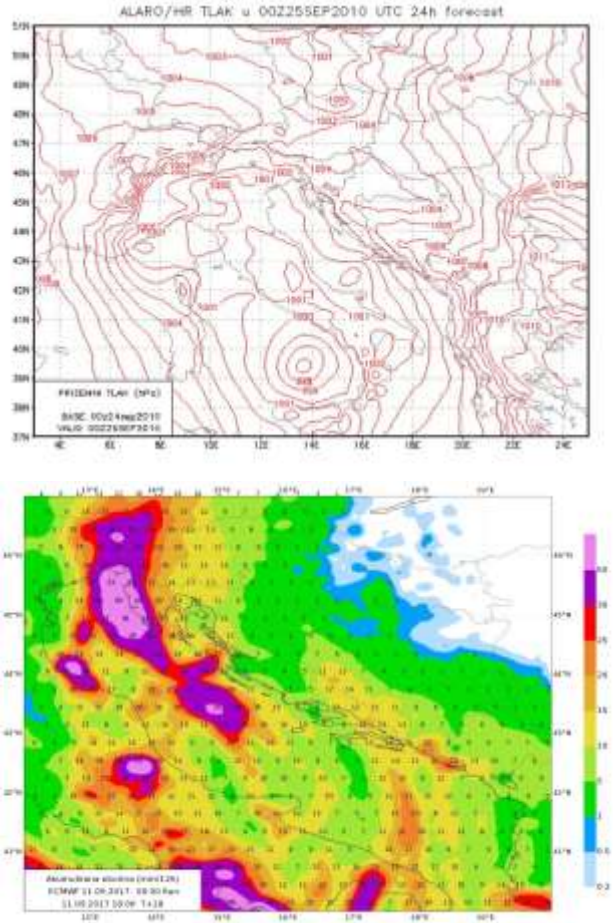


Mesoscale Analysis

Mesoscale weather analysis should be more detailed with focus on local areas.

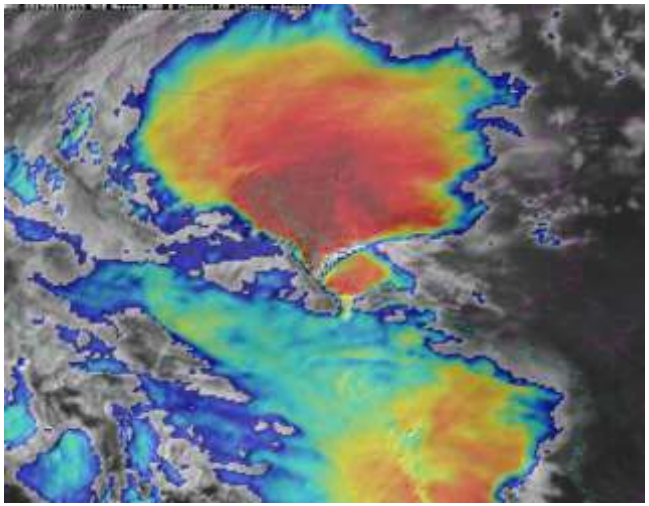
Mesoscale Analysis should contain:

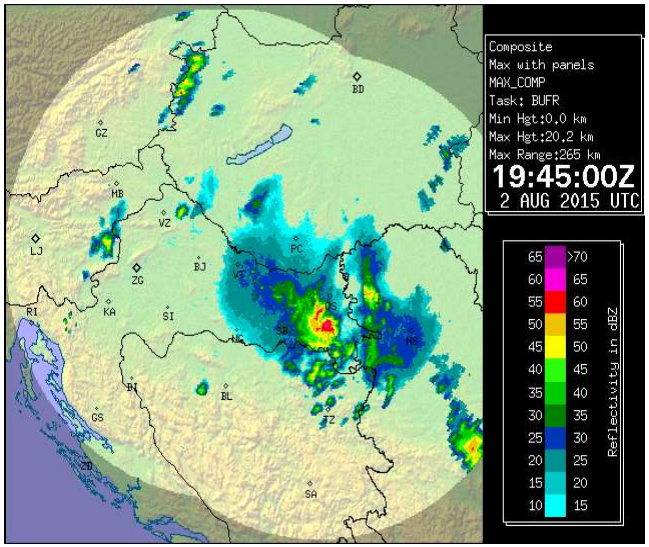
- Detailed surface analysis
- Dry line
- Gust fronts
- Instability
- Satellite images



Nowcasting Analysis

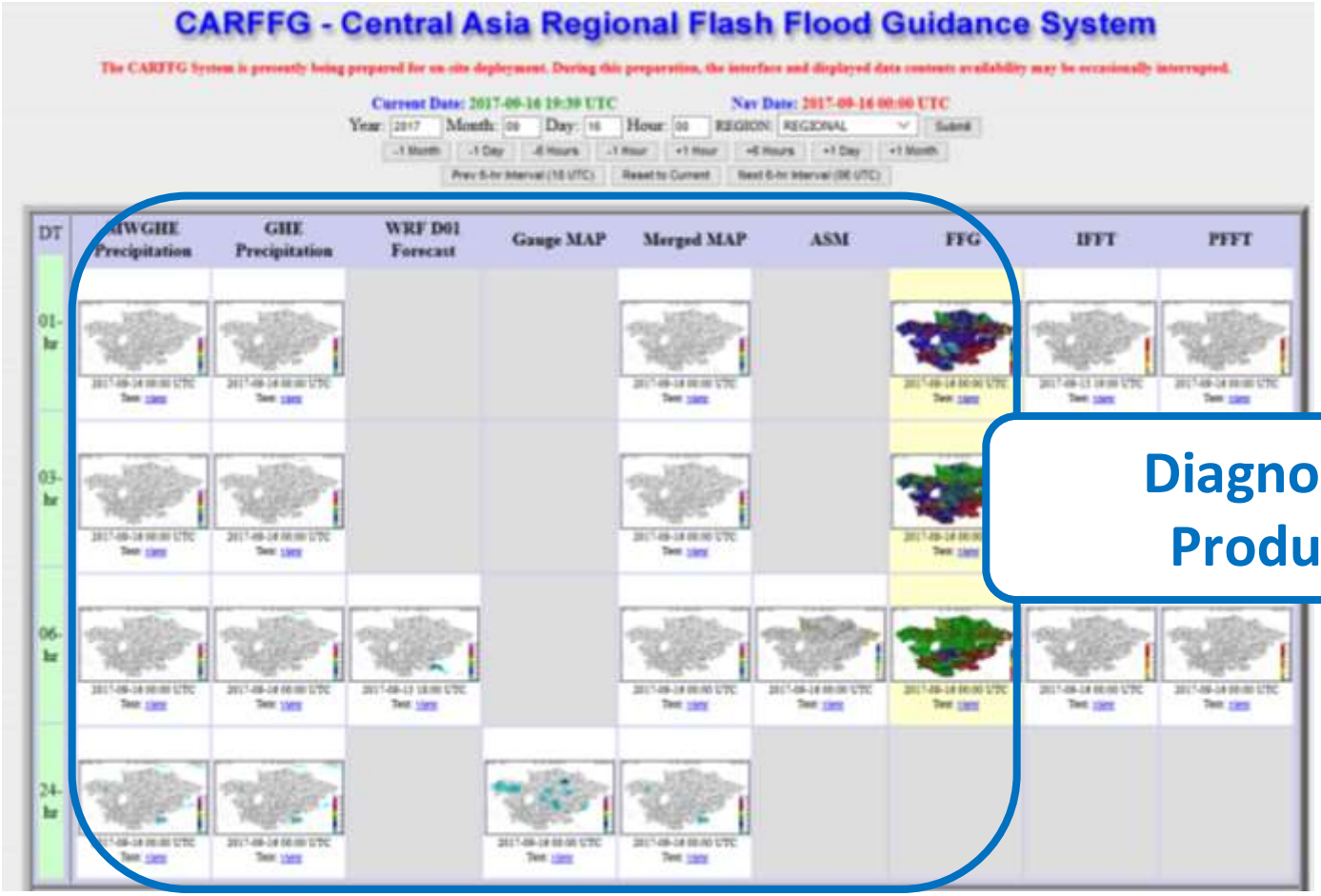
- Nowcasting is very short forecasting with high resolution spatial features.
- Analysis depends of available data and tools for better tracking of precipitation, thunderstorms development and movement.
- In nowcast analysis time is very important and every new information or radar/satellite scan can give us crucial information of potential dangerous weather.
- **Nowcasting Analysis should contain:**
- Instability analysis
- Precipitation analysis and forecast
- Ground observations
- Satellite images
- Radar images
- Lightning detections



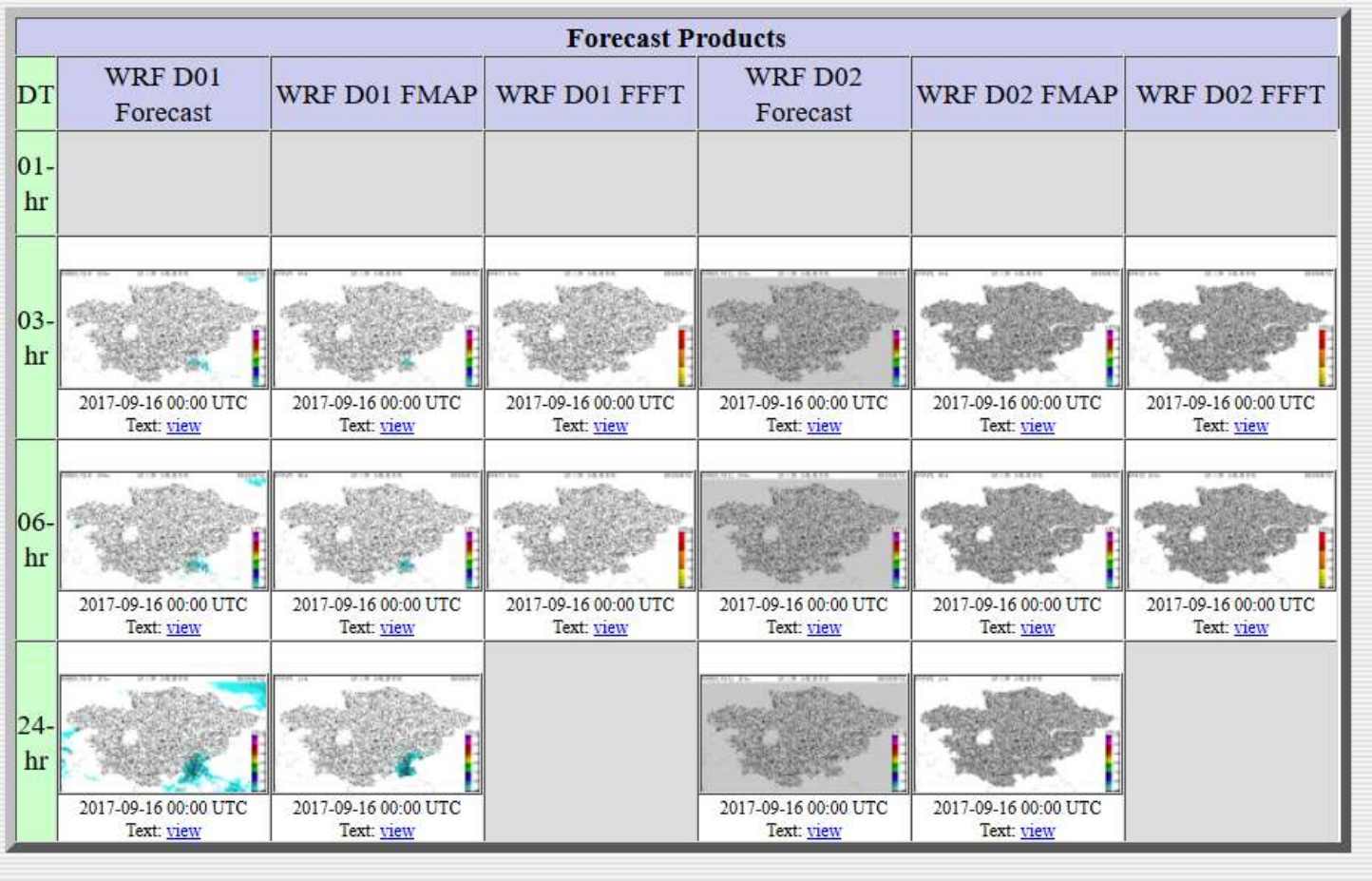


Interpretation of FFGS Products

- First, FFGS Diagnostic Products need to be analysed to investigate hydrological response of the catchments.



Interpretation of FFGS Products



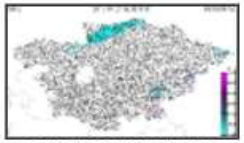
Forecast Products

DT	WRF D01 Forecast	WRF D01 FMAP	WRF D01 FFFT	WRF D02 Forecast	WRF D02 FMAP	WRF D02 FFFT
01-hr						
03-hr	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view
06-hr	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view
24-hr	2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view		2017-09-16 00:00 UTC Text: view	2017-09-16 00:00 UTC Text: view	

Prognostic Products

Interpretation of FFGS Products

Snowpack Products

DT	Gauge MAT	Latest IMS SCA	SWE	Melt
06-hr	 2017-10-25 06:00 UTC Text: view		 2017-10-25 06:00 UTC Text: view	
24-hr		 2017-10-25 00:00 UTC Text: view		 2017-10-25 06:00 UTC Text: view
4-day				 2017-10-25 06:00 UTC Text: view

Snow Products

Thank you

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For more information please visit:	**http://www.wmo.int/ffgs**
	http://www.hrcwater.org

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