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# An operational Flash Flood Guidance System: Black Sea and Middle East FFG System

WEATHER CLIMATE WATER  
TEMPS CLIMAT EAU



**WMO OMM**

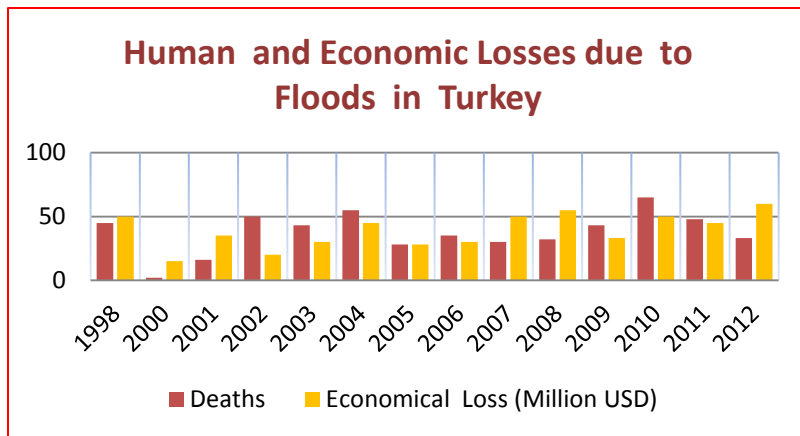
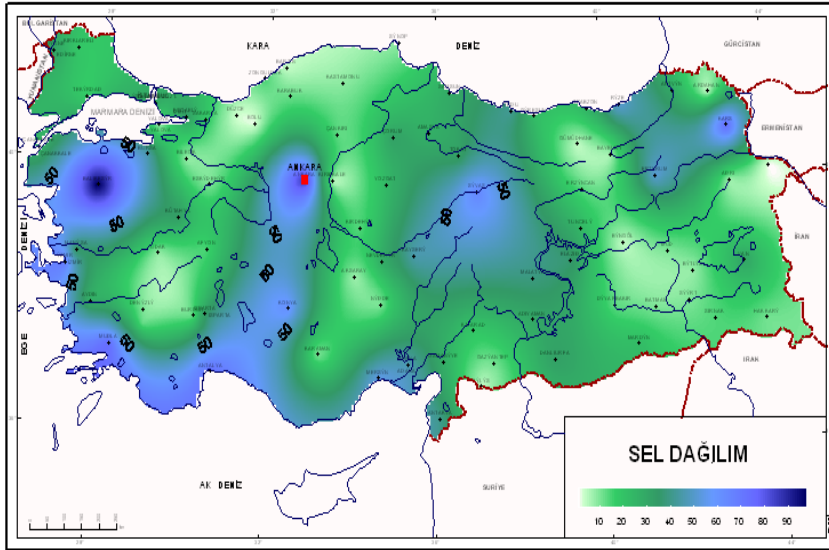
World Meteorological Organization

Organisation météorologique mondiale

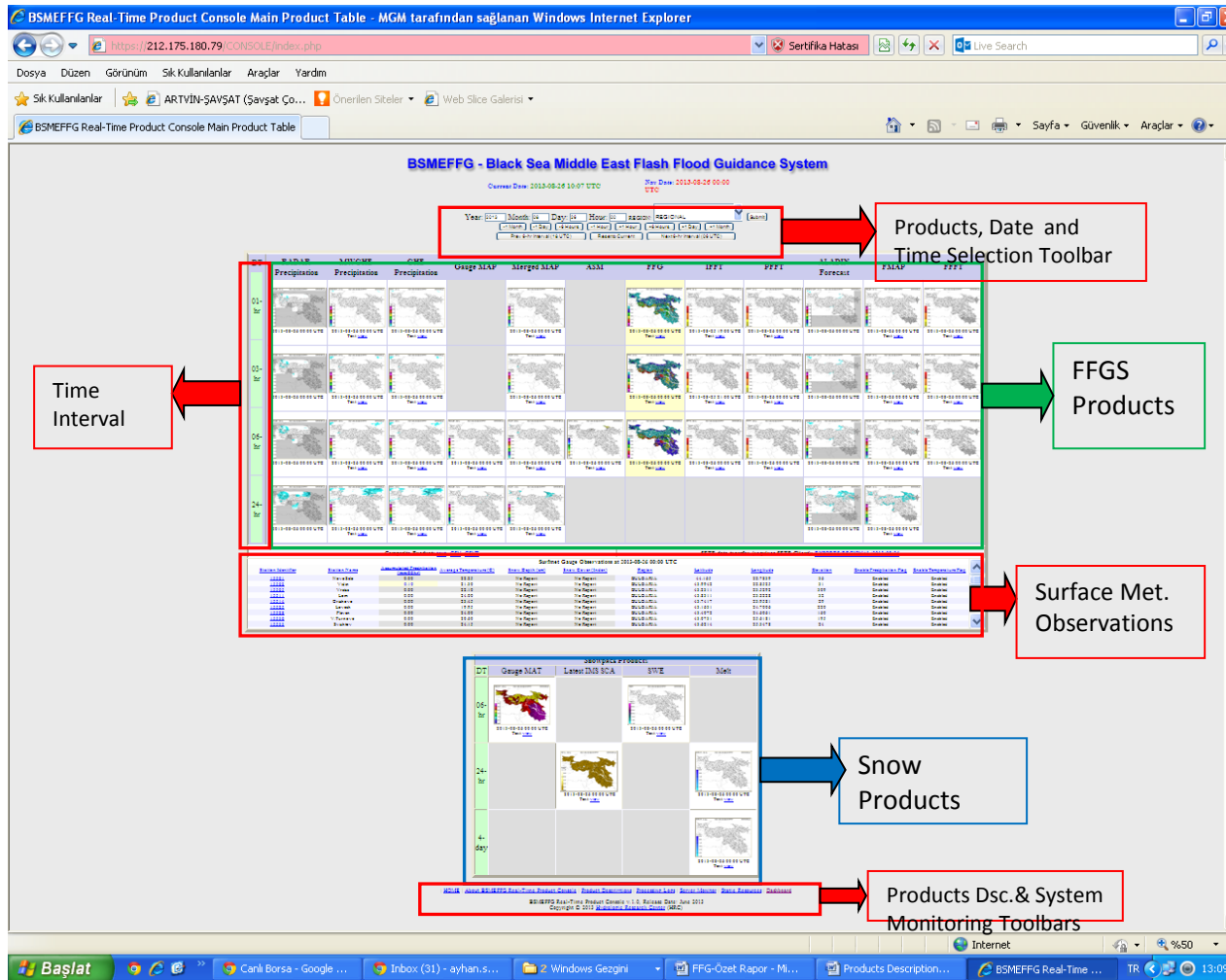
# Black Sea and Middle East FFGS



# Flash Floods in Turkey



# BSMEFFG User Console



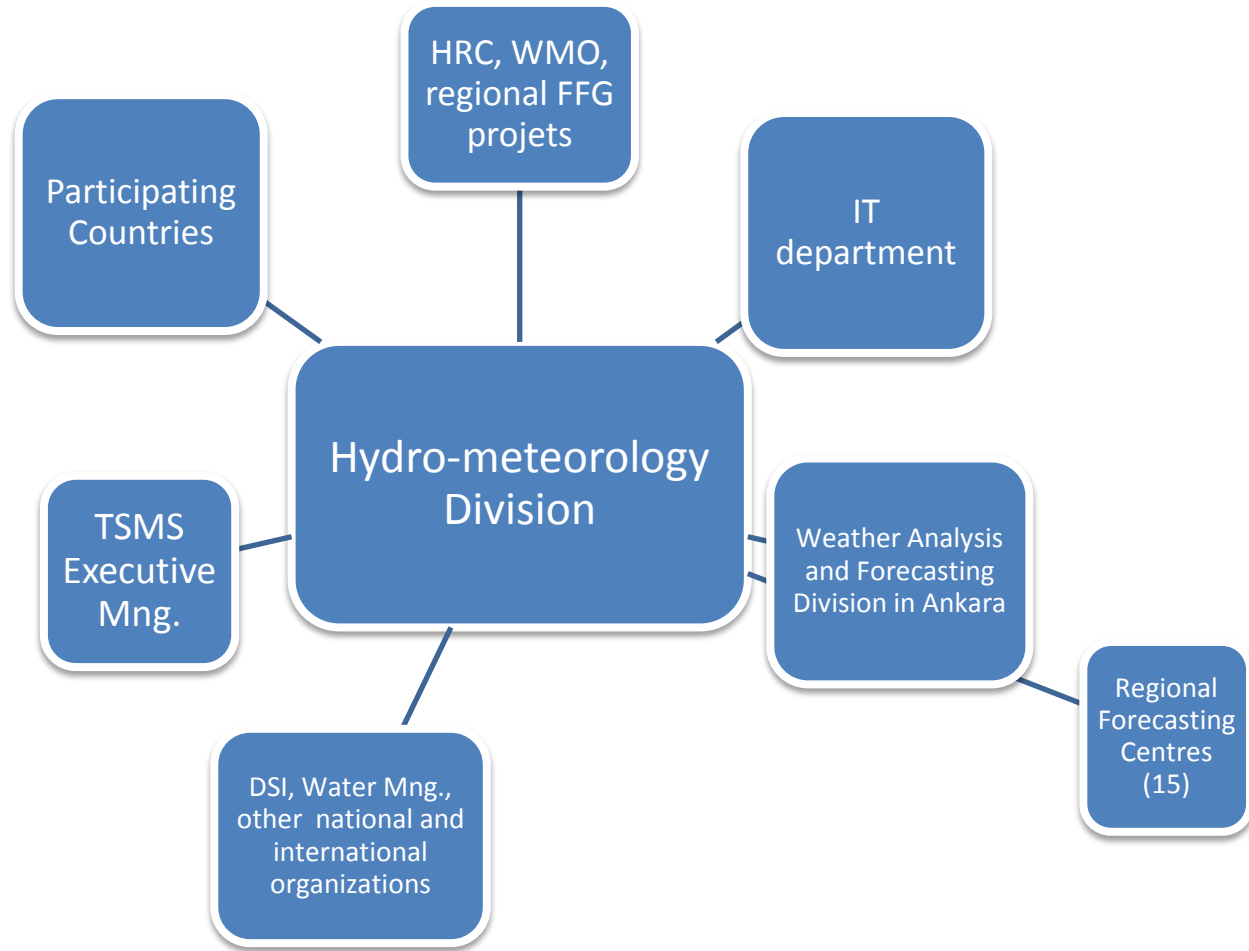
FFGS servers located at the RC (TSMS)



Participating Countries



# Concept of Operation in Turkey



# Responsibilities of Hydro-meteorology Division

- Monitor BSMEFFG and SEEFFG Systems;
- Provide first level IT maintenance and collaborate with HRC and TSMS IT department to ensure robust operation of the servers;
- Coordination with HRC, WMO, participating countries, national and international organizations;
- Participate in FFG training programme and provide training to the local forecasters;
- Prepare flash flood bulletins and distribute to the weather analysis and forecasting division and executive management;



# Responsibilities of Hydro-meteorology Division (Cont.)

- Conduct verification studies;
- Promote flash flood products to be used by other national agencies such as agriculture, water management;
- Organize and participate national and international workshops, conferences and meetings on flash floods and floods;
- Prepare user Manuel, brochures, and other material on Flash Flood Guidance System; and
- Cooperate with universities for the hydro-meteorological capacity development.



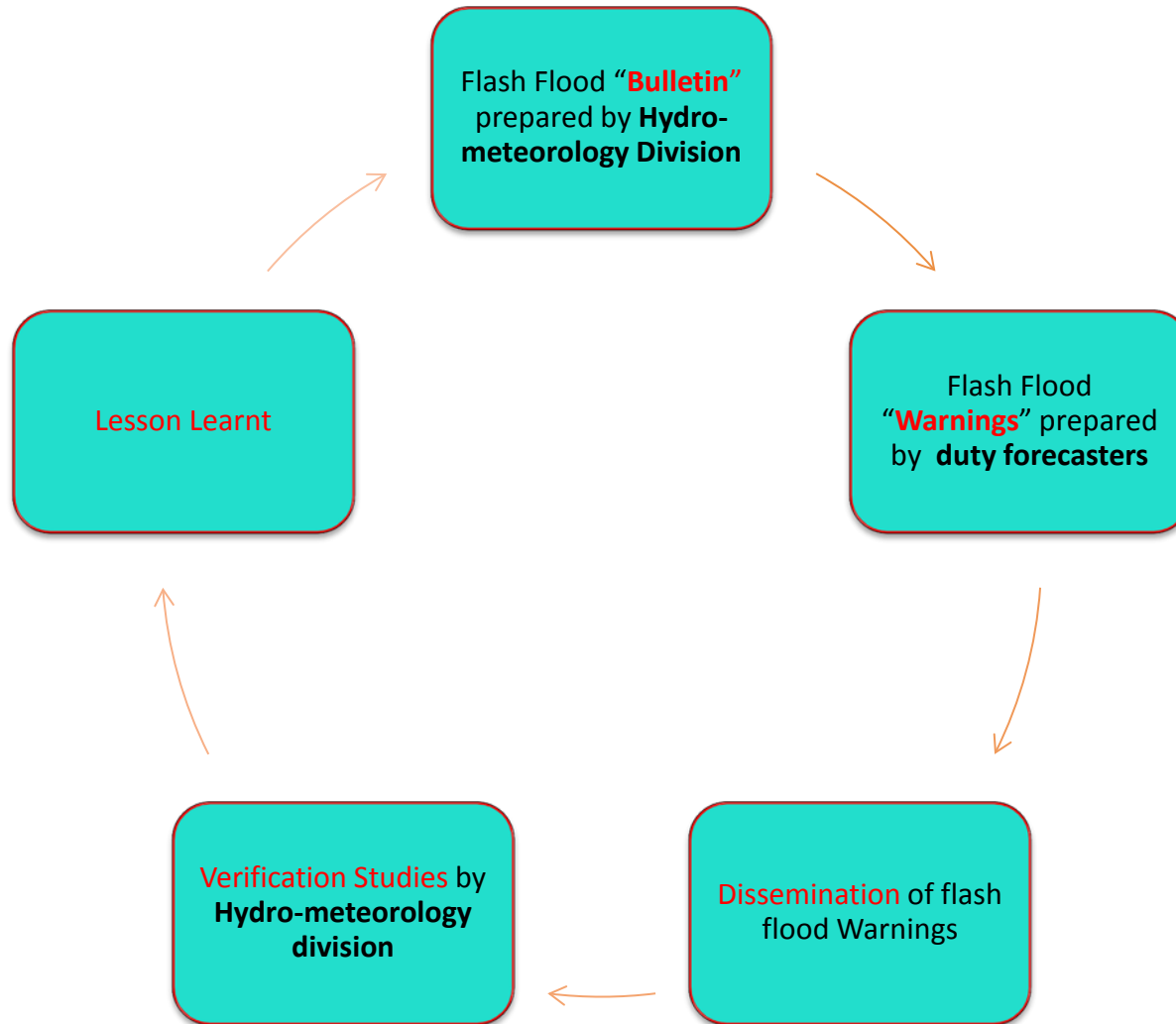
# Human Resources for the FFG Systems

	Number of Employees
Hydro-meteorologist	4
Hydrologist (Civil engineer)	1
GIS expert and programmer	1
IT	1





# Flash Flood Bulletins and Warnings



# Flash Flood Bulletins

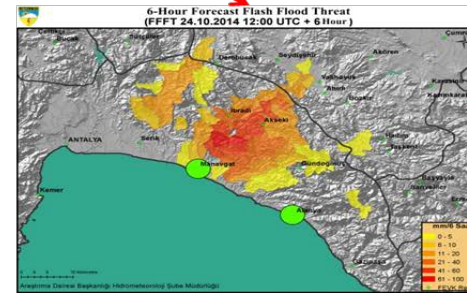
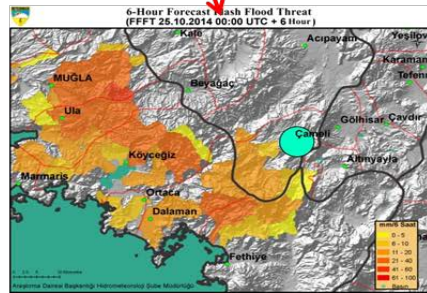
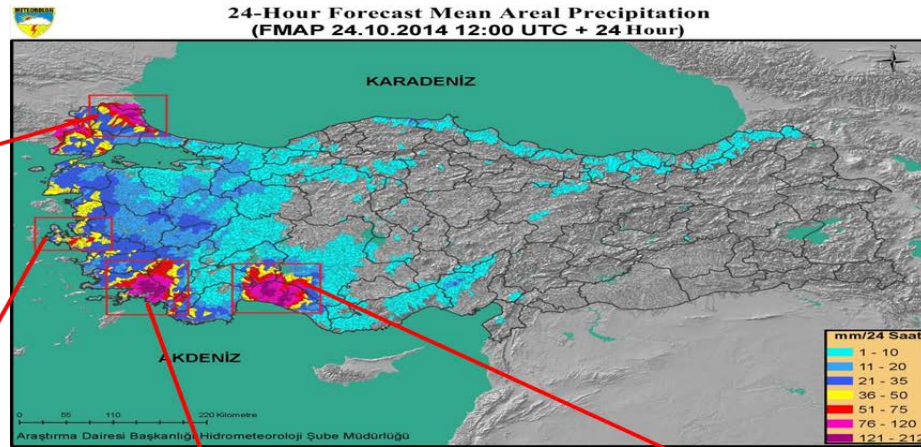
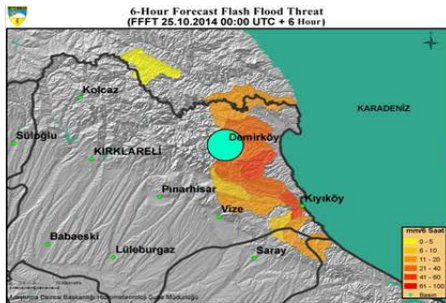
- **Flash flood bulletins** are prepared by the hydro-meteorology division as a summary of the possible occurrences of flash floods in particular regions and catchments.



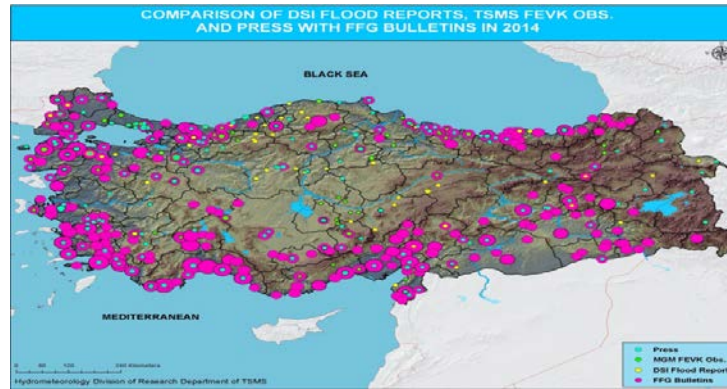
Microsoft Word  
Document



# Verification



# Verification



	Observations (TSMS, DSI, Press)			
	YES	NO	Σ	
Bulletins (21 May 2012-17 June 2013)	YES	43 (a)	25 (b)	68
	NO	18 (c)	306 (d)	324
	Σ	61	331	392

	Observations (TSMS, DSI, Press)			
	YES	NO	Σ	
Bulletins 2014	YES	58 (a)	10 (b)	68
	NO	48 (c) (DSI+MGM+Basin)	249 (d)	297
	Σ	106	259	365

Hit Rate (POD): $a/(a+c)$	0.70
False Alarm Ratio (FAR): $b/(a+b)$	0.36
False Alarm Rate (POFD): $b/(b+d)$	0.07
Threat Score: $a/(a+b+c)$	0.5

Hit Rate (POD): $a/(a+c)$	0.55
False Alarm Ratio (FAR): $b/(a+b)$	0.15
False Alarm Rate (POFD): $b/(b+d)$	0.04
Threat Score: $a/(a+b+c)$	0.5



# Operational Training at HRC (Step 3)



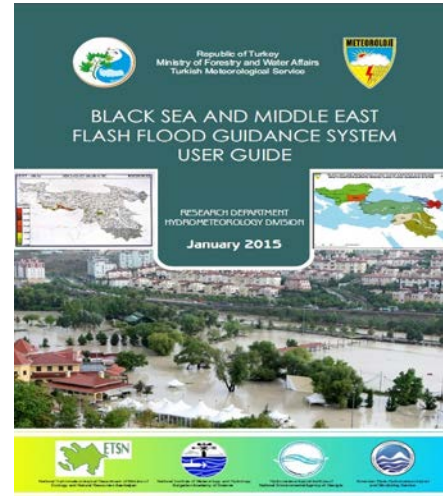
- BSMEFFG operational training took place in San Diego on 8 April-3 May 2013.
- Trainees from Turkey, Bulgaria, and Georgia participated.
- Scientific, technical, and operational aspects were presented and case studies were conducted.



# Forecasters Training of TSMS (Step 5)



- 55 forecasters from 15 regional forecasting offices were trained about BSMEFFG products and how to use them in daily forecasting held in Ankara at WMO RTC on 30 October-1 November 2013.



- BSMEFFG user guides were prepared in Turkish & English.
- Similar training is planned to be given in each member state.



# Cooperation with Universities



Prof. Dr. Zekai Şen of İstanbul Technical University was the hydrological consultant to TSMS. He gave training on the principles of hydrology, hydrological forecasting, routing, Kalman Filter, numerical analysis, QPE. Pictures show him giving lectures to hydro-meteorology division employees on, among others, ensemble prediction on 4-8 November 2013 in Ankara.



# Thank you

Paul Pilon

[ppilon@wmo.int](mailto:ppilon@wmo.int)

Ayhan Sayin

[asayin@wmo.int](mailto:asayin@wmo.int)

Petra Mutic

[pmutic@wmo.int](mailto:pmutic@wmo.int)



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