

I. R. of Iran Meteorological Organization (IRIMO)



IRIMO at a Glance

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Introduction

Geography

- I.R. of Iran : in the south-west of Asia (RAII)
- Neighbouring countries: Azerbaijan, Turkmenistan and Armenia in the north, which border the Caspian Sea, Afghanistan and Pakistan in the east and Turkey and Iraq in the west. The sea frontiers of the Persian Gulf and Oman Sea in the south connect this country to the international waters and southern neighbouring countries of the Persian Gulf.



• Area: It has an area of about **1,648,195** km² and over half of that is mountainous.

Topography: a great plateau, between two mountain ranges.

-In the north, **the Alborz Mountains** have long east-west ranges of more than 2 km height; these reach more than 5 km height in some places.

- In the west and southwest, **the Zagros Mountains** extend over a very long distance.

-The **great plateau**, rising 1 km above sea level, occupies most of the country. Some parts, such as the Dasht-e-Kavir and Kavir-e-Lut, are only about 500 m above the mean sea level.

- South of the **Caspian Sea**, there are some narrow lands of about 20 m below the mean sea level.



IRAN

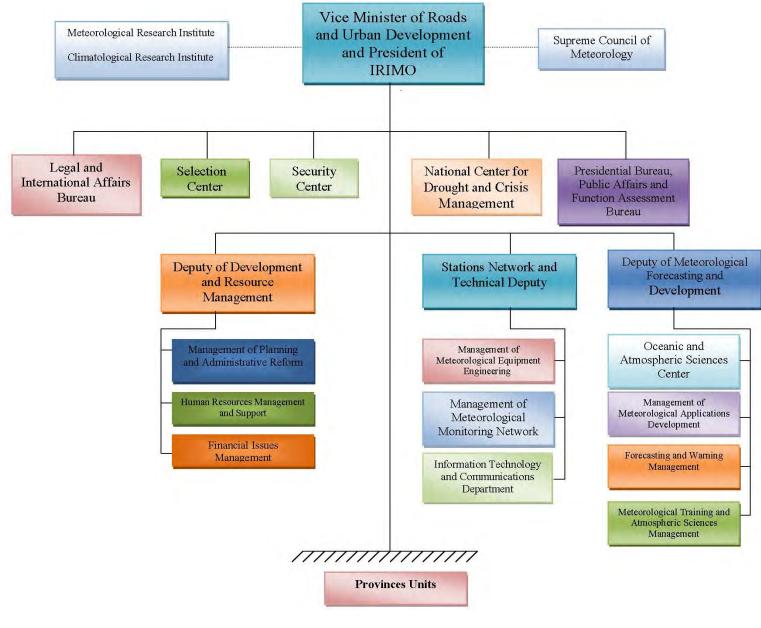
Climate

- Mainly arid or semi-arid.
- Except the northern coastal areas and west of Zagros mountain, the climate is **extremely continental**.
- The climate of the country can be divided into three categories: warm, temperate, rainy with dry summer in a narrow strip in the north; dry, hot desert in the central plateau; dry, hot steppe covering the rest of the country.
- Temperature: The annual range of temperature difference is great, from 22°C to 26°C. Cold winter especially in the north and west in which the Alburz and Zagros Mountains exist.



- **Humidity**: Since Iran is situated at a considerable height above sea level, the humidity is generally low except for the coastal regions.
- **Precipitation**: The precipitation amount varies considerably with topography. In the northern and western mountains the annual mean precipitation is more than 480 mm; snow forms most precipitation. The plateau has most of its rainfall in late fall to early spring. In the Caspian coast, where the rainfall begins earlier, it is maximal in autumn. In the dry period between May and October, rain is rare in most of the country.





Structure of IRIMO



Principal Objective 3

Decision-Making in Country Management and Public Services

Mission

Expert leading and guidance , internal and external organizational collaboration with weather, climate, water and other related environmental Issues, in order to increase economic benefits, increase defense capability, reduce the impacts of natural disasters and protect life and property all over the country

Outlook

A high-developed organization equipped with advanced technology, knowledge, and strong, motivated, influential experts

to increase economic benefits and protect life and property all over the country,

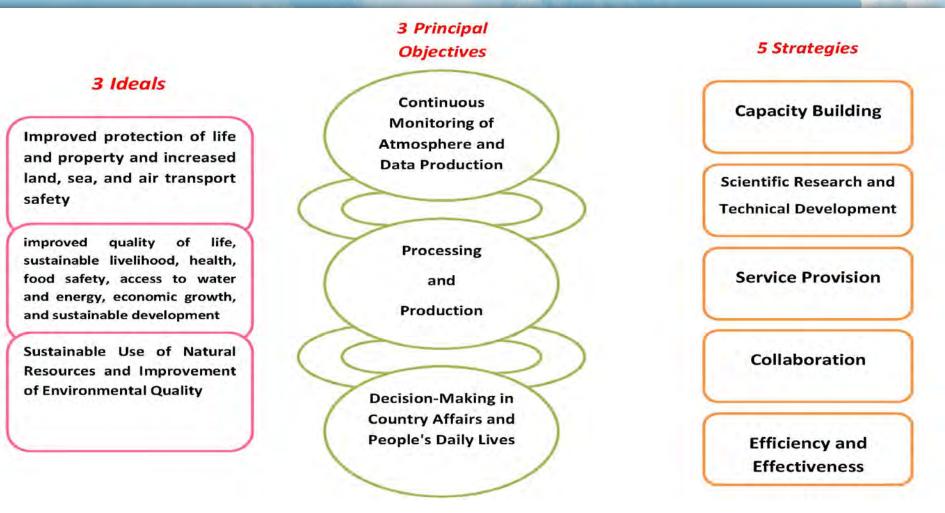
to lead and guide internal and external organizational activities related to weather, climate, water and other environmental issues



Ideal 1:

- Improved protection of life and property and increased land, sea, and air transport safety Ideal 2:
- improved quality of life, sustainable livelihood, health, food safety, access to water and energy, economic growth, and sustainable development
 Ideal 3:
- Sustainable Use of Natural Resources and Improvement of Environmental Quality

An Overview of Ideals, Principal Objectives, Strategies, and Plans



Expected Results

- 1) Enhanced Scientific Capacity (Education)
- 2) Increased User Awareness
- 3) Highlighted Role of Private Sector
- 4) Issuance of Accurate Forecasts and Warnings
- 5) Improved Observation Skills
- 6) Improved Processing Skills
- 7) Improve Telecommunication Skills
- 8) Promote Database
- 9) Scientific Cooperation with Academic Centers and Application of applied researches

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- 10) Improved Quality and Quantity of Services
- 11) Promoted Early-Warning System for Disaster Risk Reduction
- 12) Highlighted Role of the Organization in Decision-Making and Application of Products in Infrastructure Projects

13) Integrated Observation Systems in Collaboration with Other Organizations

14) Application of Administrative Reforms for Improvement of Organization effectiveness 15) Highlighted Human Resources Management (qualified and motivated staff members)

Unit and Quantitative Performance Indicator of Meteorological Products

Forecasting and Warning Management Statistics of IRIMO-2018										
No.	Subject	Activities	Daily	Weekly	Yearly					
1		Issuing Aeronautical Airmet, Sigmet Warnings	11	77	4026					
2		TAFOR/Short, Medium & Long Term Airport Forecast	178	1246	65148					
3	Aeronautical	Aeronautical Forecast of SIGWX and Wind Charts	36	252	36176					
4		Area Forecast in country	26	182	9516					
5		Process Forecast for Imam Khomeini & Mehrabad International Airports	48	336	17568					
6	Agriculture	Agrometeorological Recommendations	11	77	4026					
7	and	Agrometeorological Newsletters	5 🧹	35	1976					
8	Climate	Agricultural Notifications and Warnings	0	0	60					
9		Marine Area Forecast with NAVTEX Format on Persian Gulf, Hormoz Strait and East of Oman Sea	16	112	5856					
10	Marine	Weather & Marine Point forecast for Asalooyeh, Boushehr,Khark,Salman & South Pars	10	70	3660					
11		Providing and Issuing Marine Notifications and Warnings	0	0	30					
12	Model	Running SWAN Model	64	448	23360					
13		Issuing 3-day Forecast Bulletin for 31 Provinces	186	1302	68076					
14		Issuing 7-day Forecast Bulletin for 31 Provinces	0	651	33852					
15		Issuing Warnings for Severe Weather Conditions	0	0	229					
16	Public	Broadcasting Meteorological News on TV and Radio	22	154	8052					
17		Providing and Issuing Specific Forecast for normal and military users	0	0	100					
18		Providing and Issuing Air pollution Forecast	0	20	1040					
19		Road forecast	0	0	80					

Highlights and Valuable Experiences

Crisis Management of floods in March and April 2019

Report for RAII

Improvement of Process Capability

Specialized Training and RTC

Establishment of Sand and Dust Monitoring System

Authorization and establishment of the Meteorological Institute

Applied Meteorological Development System (TAHAK)

Application of New Technologies in the Design and Development of **Forecasting System and Studying the Results** of the April 2019 Floods

Necessity of running flood forecasting system

- 1. Increasing flood event at regional and local level
- 2. Increasing flood event damage
- 3. Optimal use of resources
- 4. Early Warning Systems as one of the non-structural management methods through Forecasting time and real intensity, have a significant role in reducing damages
- 5. Forecasting and Early Warning In order to protect the facilities of Pars Special Economic Energy Zone

Overall Goals of the Flood Forecasting System

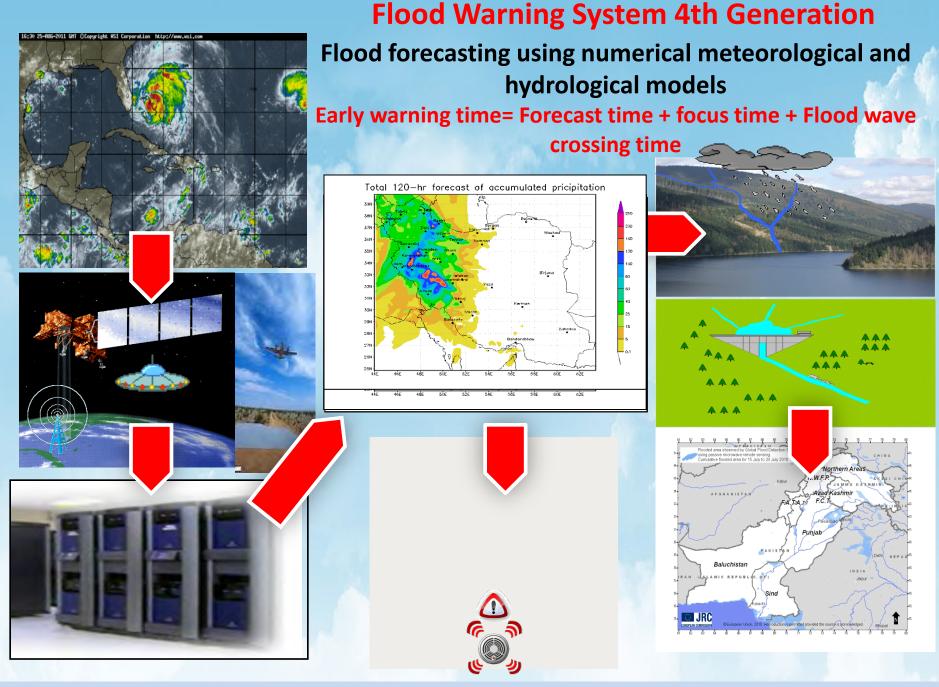
- 1. Identifying and the way of occurrence of heavy rainfall and floods;
- 2. Reduction of surprisal against flood occurrence
- 3. Reduce flood damage;
- 4. Creating scientific and executive capabilities;
- 5. Localization of models and required modifications;
- 6. Operating the Early Warning System and the warning desk.

System specific goals

- 1. Make Flood Early Warning System operational;
- 2. Promotion of short-term forecasts;
- Development, promotion and creating monitoring; software systems by Utilizing advanced technologies;
- Promotion and initiation of media information systems and Promotion and optimization of information structure;
- 5. Create warning desk structure and crisis and incident command system.

Conceptual design of Integrated Flood Forecasting System 4th Generation (Based on numerical weather prediction)

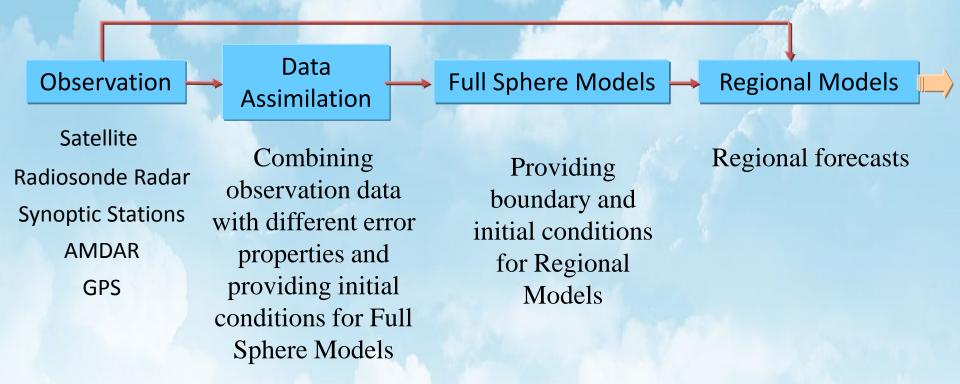
4th Generation of Flood Forecasting System: is the most complete method of flood forecasting and provide managers with an acceptable timeframe for flood management.



The most complete method of flood forecasting and provide managers with an acceptable timeframe for flood management

The numerical weather forecasting process is a complicated process.

The below scheme illustrates this process in a simplified manner.



Physiography of the Field,

Regional Model Output

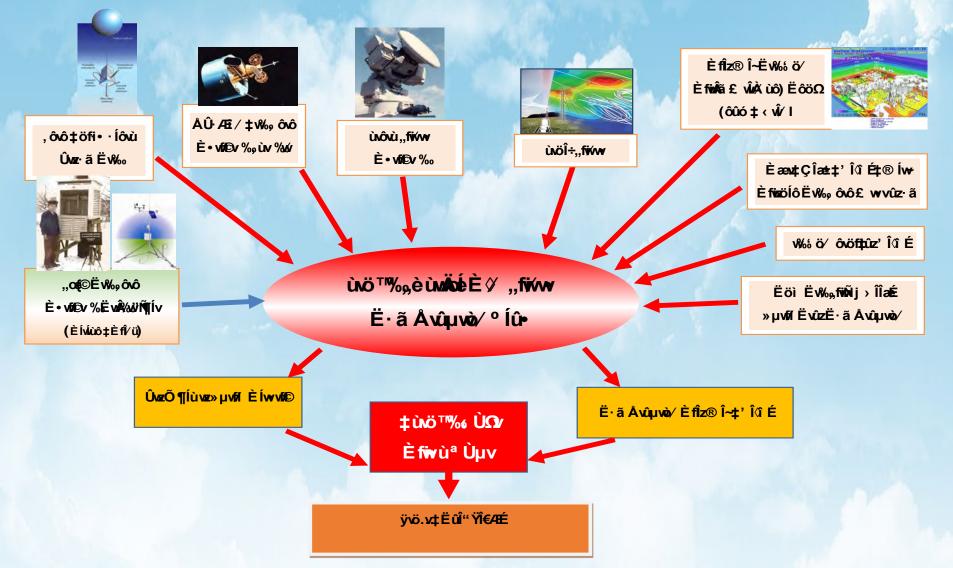
Hydrologic

&

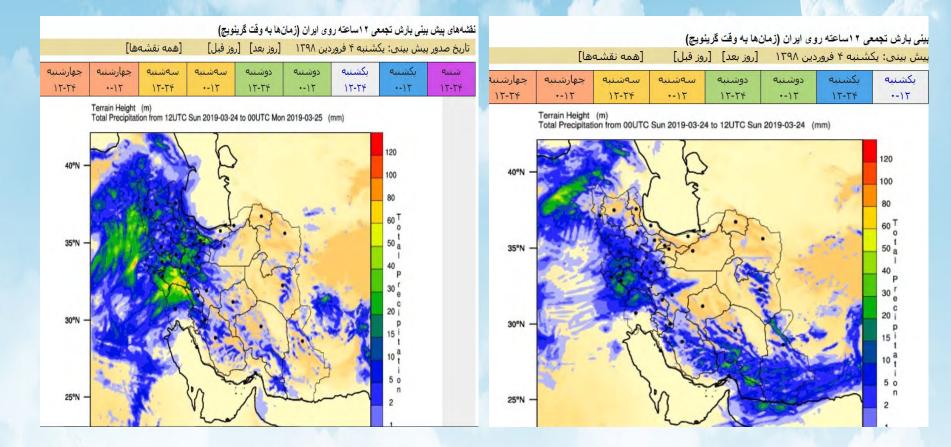
Flood Forecasting

Hydraulic Models

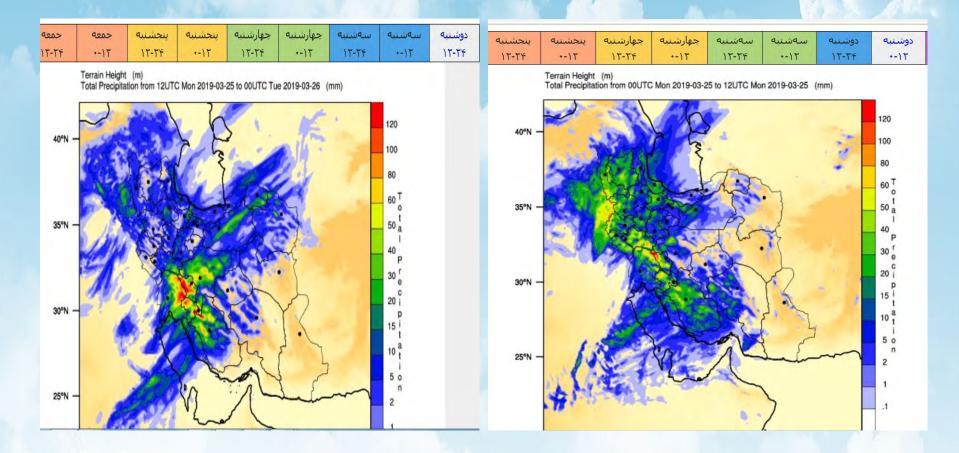
Conceptual Design of Flood System Programme



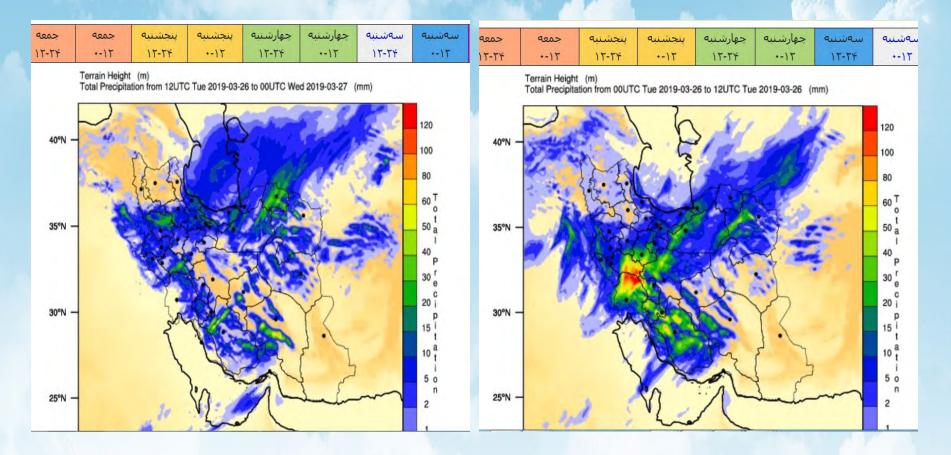
12-Hour Cumulative Precipitation Forecast Map Iran / 24 March, 2019



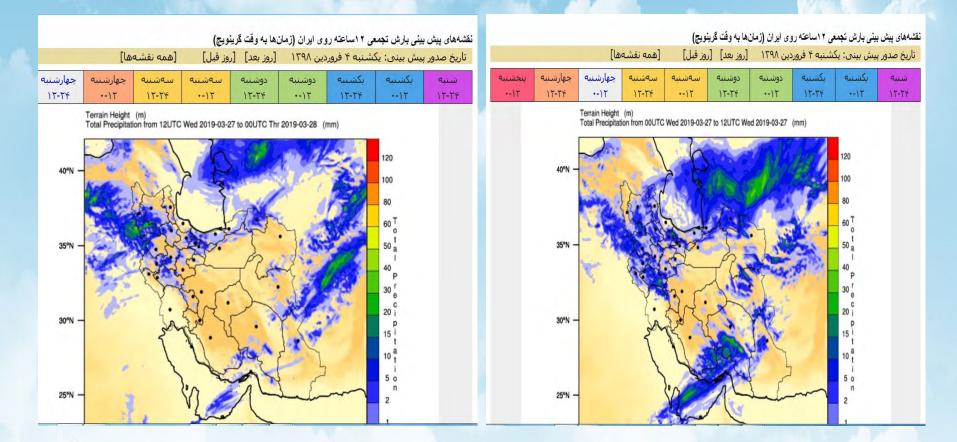
12-Hour Cumulative Precipitation Forecast Map Iran / 25 March, 2019



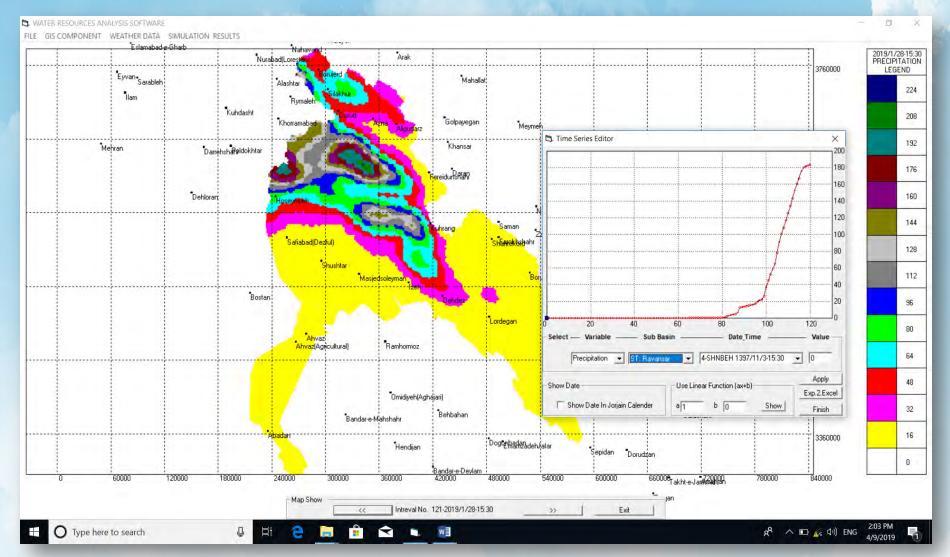
12-Hour Cumulative Precipitation Forecast Map Iran / 26 March, 2019



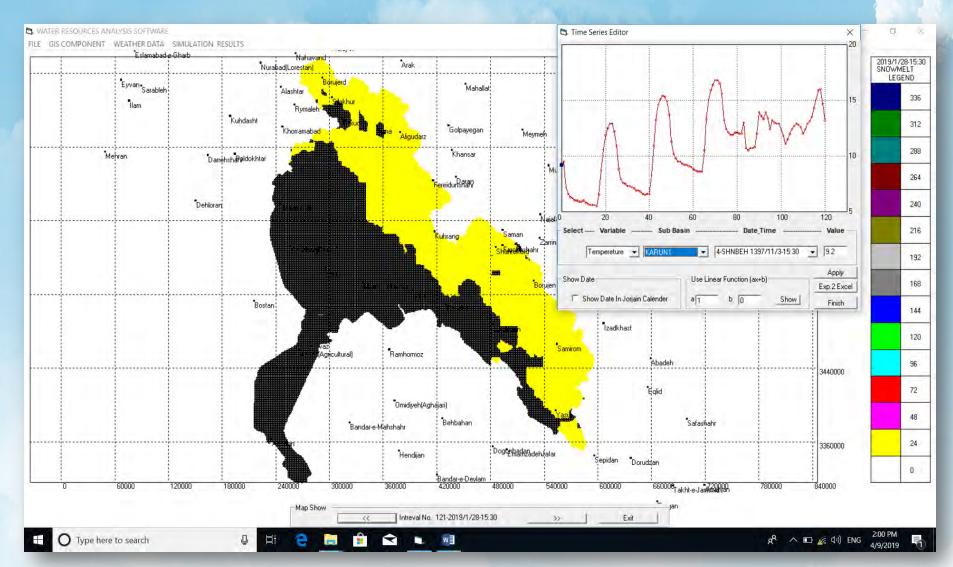
12-Hour Cumulative Precipitation Forecast Map Iran / 27 March, 2019



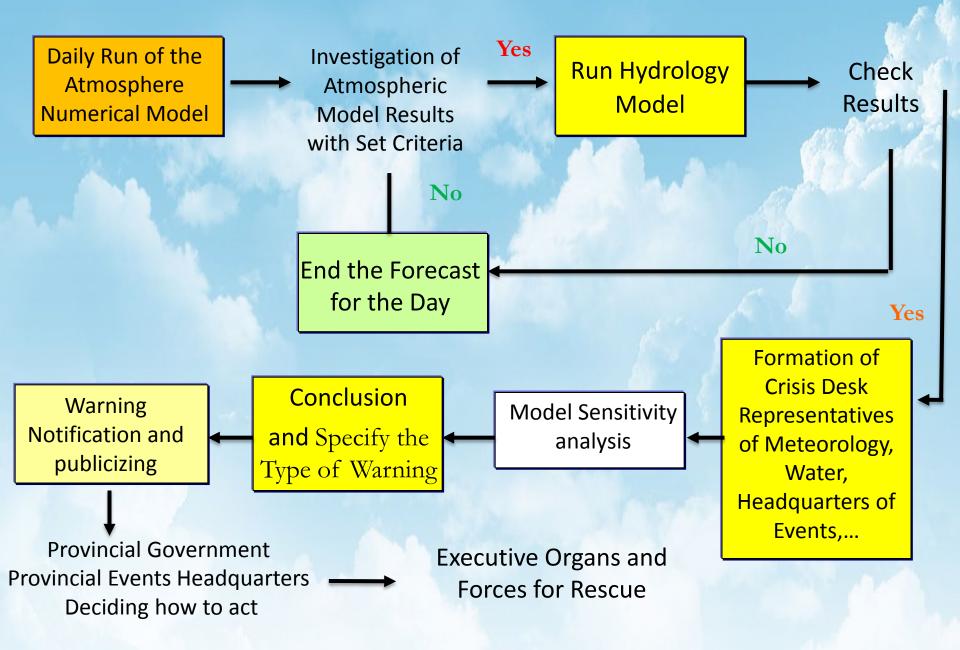
Map and Graph of Precipitation Intensity Forecast in Karun-Dez Basin



Map and Graph of Temperature Rise and Snowmelt Forecast in Karun-Dez Basin



Workflow of Flood Warning Desk and Decision Making Structure

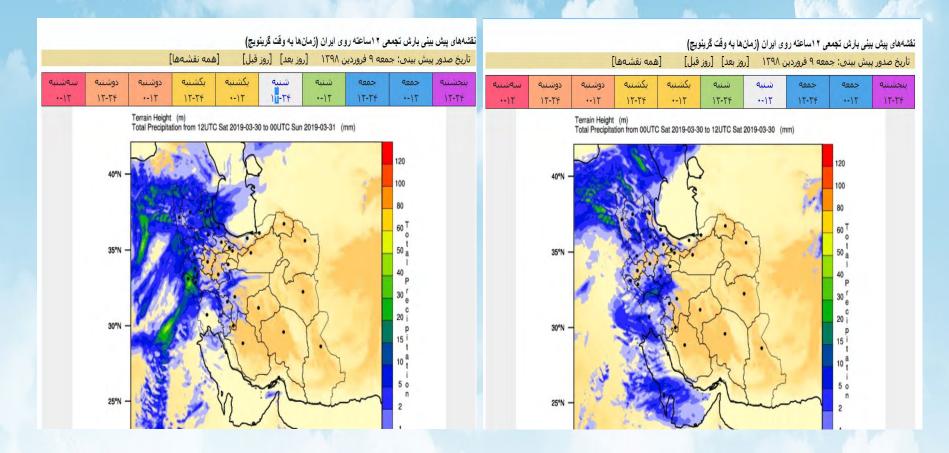


Output Results of Hydrology for Flood Forecasting System in Karun-Dez, Karkheh and Zohreh Basins 26-27 March 2019

نام حوضه	نام حوضه	تاريخ	حداکثر دبی لحظه ای(متر مکعب بر ثانیه)	حجم ۵ روزه	حجم ۱۰ روزه	
	ورودی سد کارون ۴	1844/1/8-14:8+	ATVA	***	1414	
حوضه کارون و	ورودی سد کارون ۳	1894/1/9-7+:8+	FAT-	244	1777	
	ورودی سد کارون ۱	1894/1/9-9:8+	тара	۶۷۹ ۴۳۴ ۲۷۶ 199 ۲۹۷ ۲۳۷ ۲۹۷ ۲۳۷ ۱۲۸۸ ۸۱۲ ۱۵۴۲ ۹۸۴		
دز	كدار لندر مياني	184/1/9-Y:F+	1119			
	سد بختیاری	1544/1/9-17:5+	1-79			
	سد تله زنگ	1894/1/9-1+:2+	TF-0			
	سد دز	1294/1/9-14:2+	FIAA			
	بالا رود	1894/1/9-10:5.	997	171	179	
	سد سیمرہ	189A/1/Y-19:8+	1-49	170	FTT	
حوضه	کرخه میانی	189A/1/Y-A:T+	19-9	۵۸۸	1-44	
كرخه	سد کرخه	1844/1/Y-17:8.	7-90	AVY	1177	
حوضه	سد پارسیان	1894/1/-11:8.	1775	104	190	
زهره	سد چمشیر	1894/1/9-19:8.	Q1-1	907	PAY	

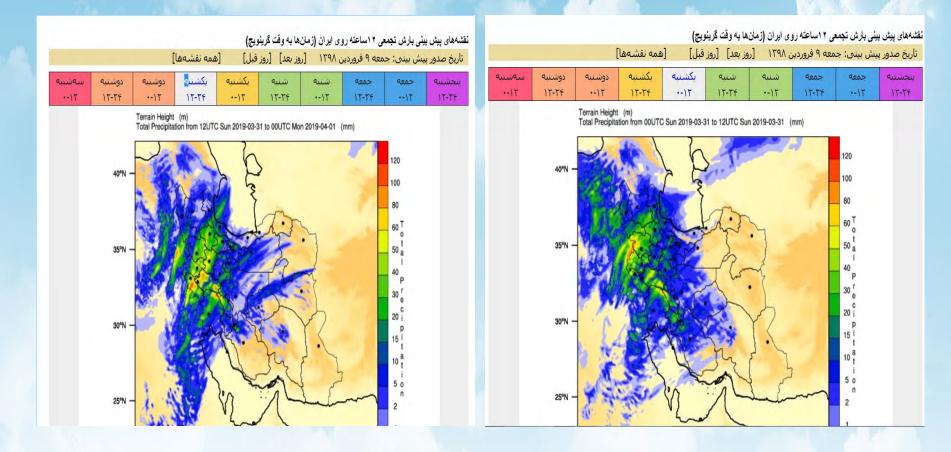
System Forecast 30 March-1 April 2019

12-Hour Cumulative Precipitation Forecast Map-Iran / 30 March, 2019



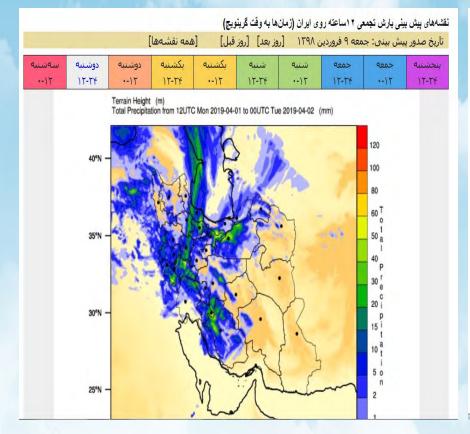
System Forecast 30 March-1 April 2019

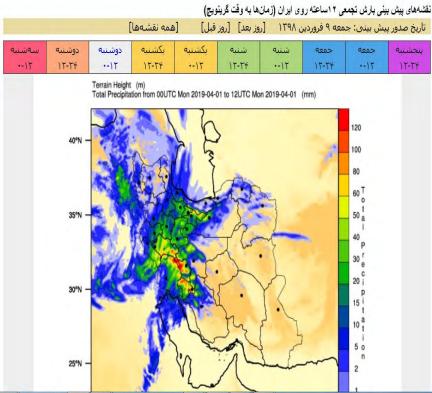
12-Hour Cumulative Precipitation Forecast Map-Iran / 31 March, 2019



System Forecast 30 March-1 April 2019

12-Hour Cumulative Precipitation Forecast Map-Iran / 1 April, 2019





Output Results of Hydrology for Flood Forecasting System in Karun-Dez, Karkheh and Zohreh Basins / 1-2 April 2019

ئام حو ضه		گزارش خلاصه پیش بینی سیل کارون									
		میانگین داده های پیش بینی شده				داده های مشاهداتی			خطای پیش بینی درصد		
	نام	تاريخ	حداکثر دہی لحظہ ای(متر مکعب ہر ڈائیہ)	حجم دبی ۵روزه	حجم دبی ۱۰ روزه	حداكثر دبی لحظه ای(متر مكعب بر ثانیه)	حجم دہی فروزہ	حجم دیی ۱۰ روزه	حداكثر دبی لحظه ای(متر مكعب بر ثانیه)	حجم دبی ۵روزه	حجم دبی ۱۰ روزه
	سد کارون ۴	1594/1/17-14:5+	1.79.	IVIT	PFQF		15			T	
	پل شالو	1592/1/12-14:2+	TOA	ŀ	۳٩						
	سد کارون ۳	1594/1/15-19:50	TAA	1.	м						
وونز	سد کارون ۱	1598/1/15-5-5-	FTDY	919	IITT						
حوضه کلرون و دز	گدارلندر میانی	1547/1/12-15:2.	1899	141	TTY						4
	سد گتوند	1594/1/15-5-5	TAIT	57F	959	***		11	10		١۴
	سد بختیاری	1594/1/15-0:50	7-00	FVT	٨٨٥					1276	1.11
	ورودی سد دز	1594/1/15-19:50	9469	1099	TPVA	90	١٣٠٠	11	9	T.	19
	بالارود	1594/1/17-10:5+	17-1	FFT	F99		1				

Output Results of Hydrology for Flood Forecasting System in Karun-Dez, Karkheh and Zohreh Basins / 1-2 April 2019

		1			ر سیل کرخه	به پیش بینی	رش خلاص	كذار	3		
خطای پیش بینی درصد		داده های مشاهداتی				میانگین داده های پیش بینی شده					
حجم دبی ۱۰ روزه	حجم دبی فروزه	حداكثر نبى لحظه اى(متر مكعب بر ثانيه)	حجم نبی ۱۰ روزه	حجم دبی فروزه	حداكثر دبى لحظه اى(متر مكعب بر ثانيه)	حجم دبی ۱۰ روزه	حجم دبی گروزه	حداکثر دبی لحظه ای(متر مکعب بر ثانیه)	تاريخ	تام هريضه	ئام حوض ه
	Π	f			۵	194.	VFP	51	1294/1/17-7+:7+	سازبن	(Terri
۳٩	٩		١٣٠٠	٧۴.		14.9	14	64FY	1594/1/17-19:50	سد سيمره	t
						91.	FF9	T.9Y	1547/1/12-22:2+	پلدختر	دوخنه کرخه
						1471	1194	9778	1194/1/17-11:0+	كرخه مياني	S.
"	1.	14	14	10	٨٩	riir	irar	1.114	1194/1/11-11:1-	سد کرخه	

Structure Coordinated to the Core Processes Based on the Strategic Plan

