IN THE NAME OF GOD

I.R. of IRAN NATIONAL REPORT for 21th session of Coordination committee of HYDROMETEOROLOGY and pollution monitoring of the Caspian Sea

17-18 November 2016

Baku, Azebaijan

Titles

- introduction
- Section 1. development of measurement network in southern coasts of Caspian Sea
- Section 2. Marine weather prediction
- Section 3. Research Activities
- Section 4. Marine Meteorological Data Bank

INTRODOCTION

* Implementation of the agreement of hydro meteorological cooperation and need to attention to the aims of agreement

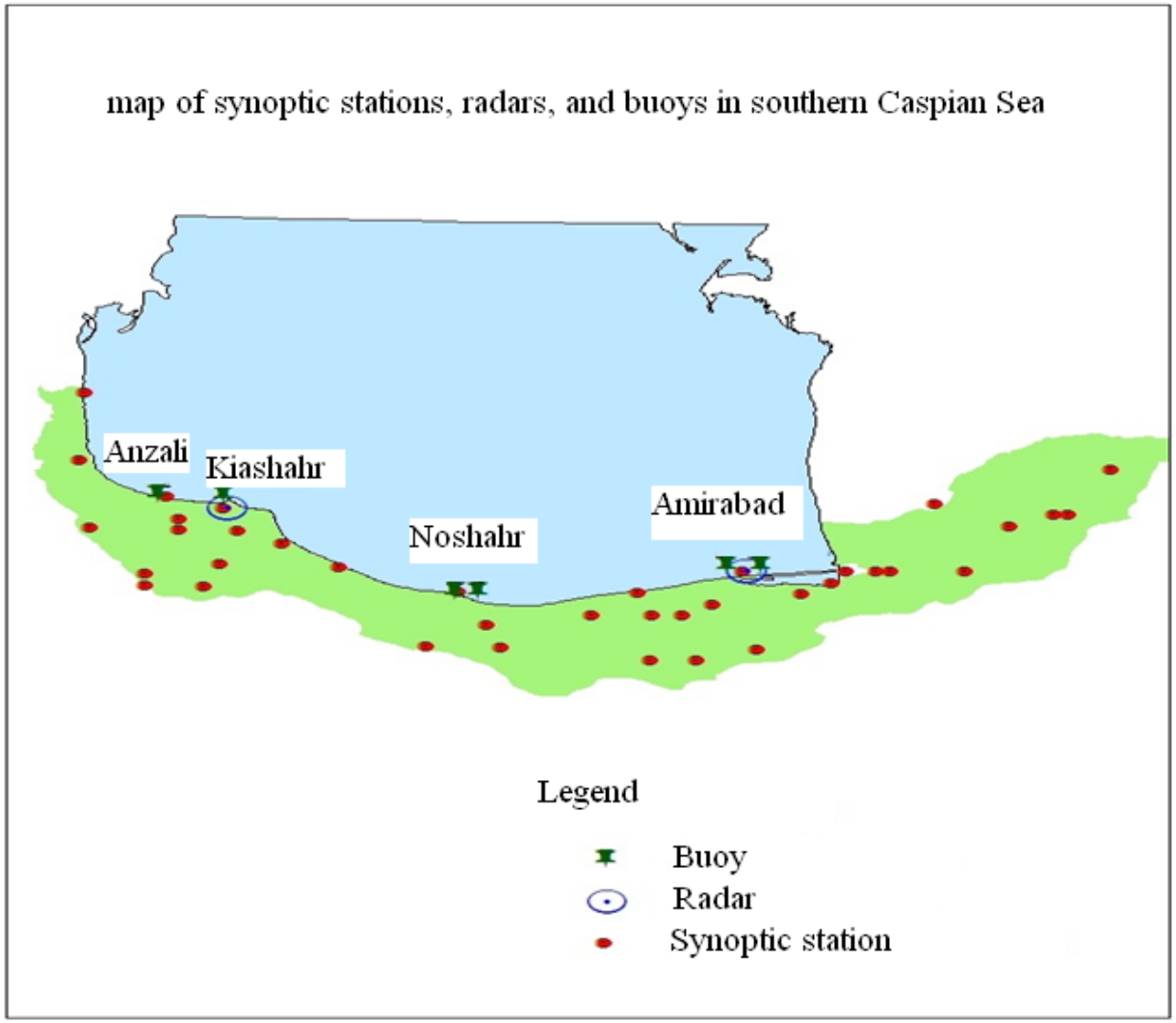
* Integrated monitoring and prediction of the Hydro meteorological characteristics of the Caspian Sea, the main aim of the agreement

- Preparedness of I.R. of Iran for establishment of integrated monitoring network and producing marine meteorological services

Section 1

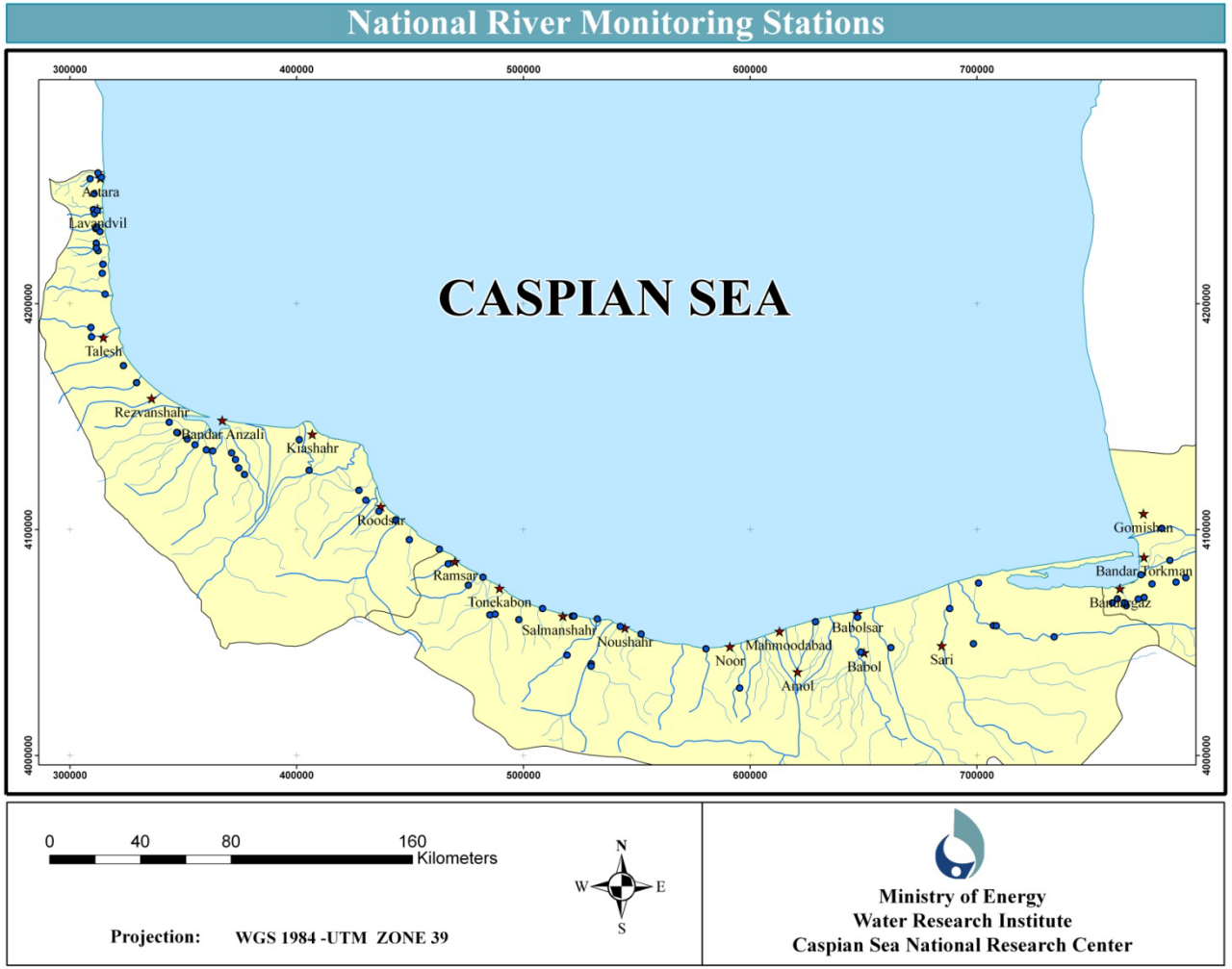
Development of measurement network in southern coasts of Caspian Sea

distribution map of marine stations

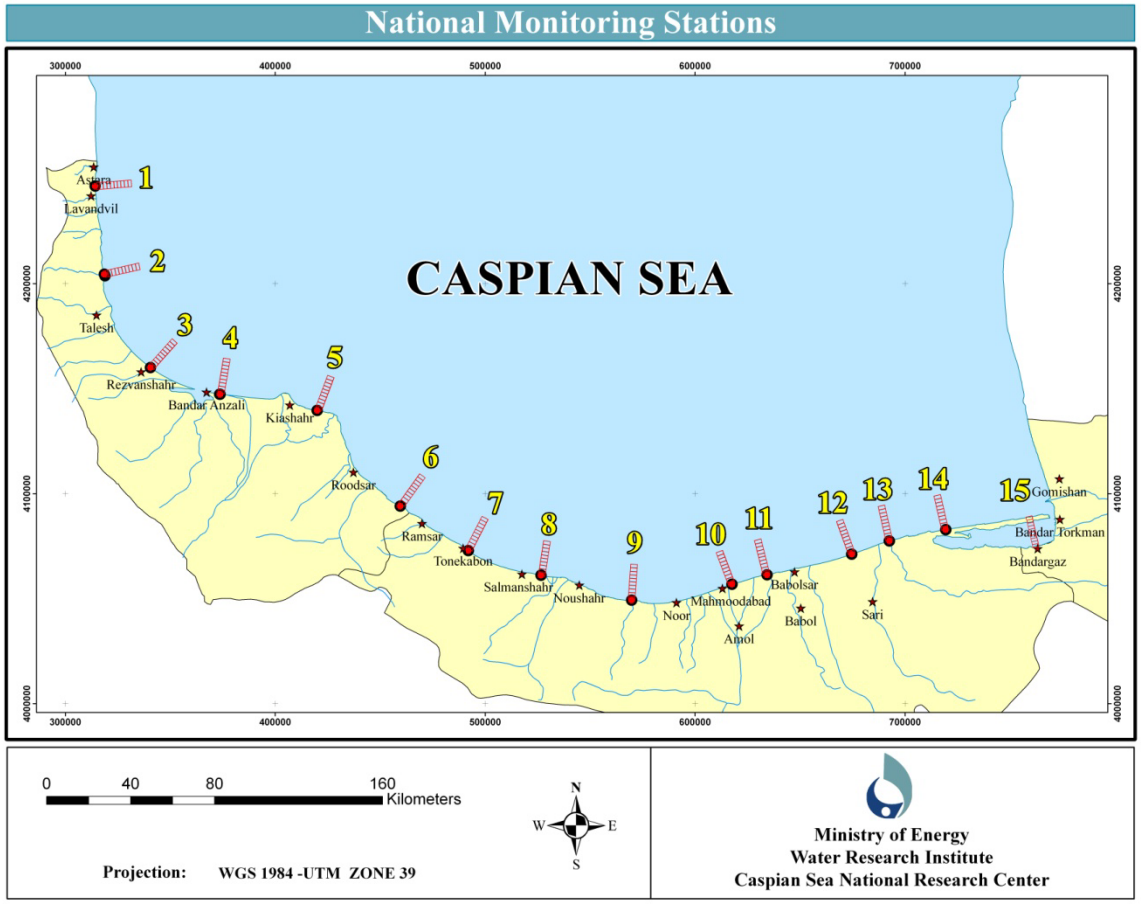


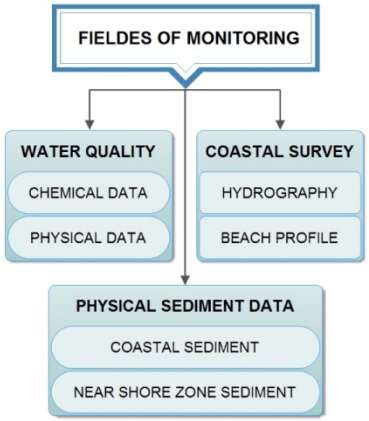
National water level measuring network

National river monitoring network

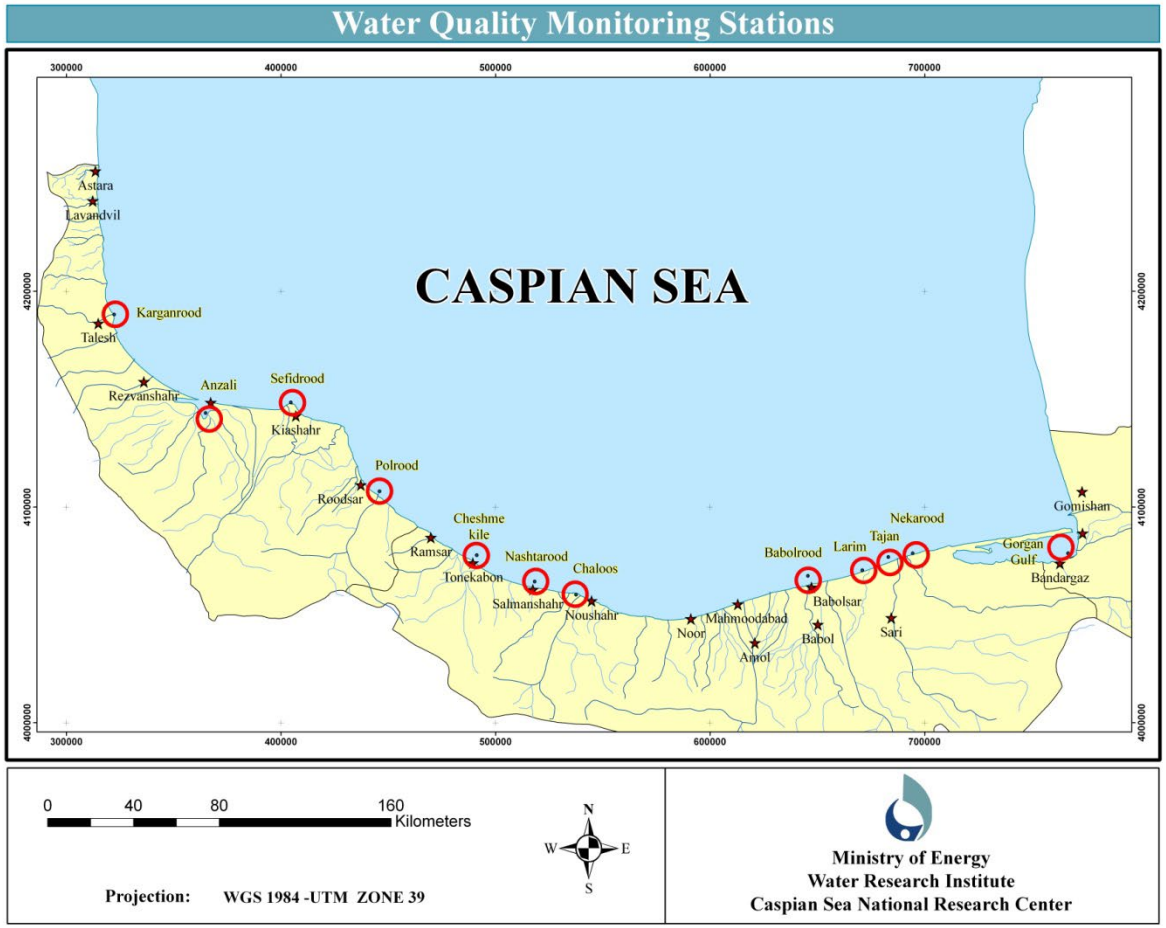


NATIONAL SEDIMENT MEASUREMENT NETWORK





WATER QUALITY MONITORING NETWORK



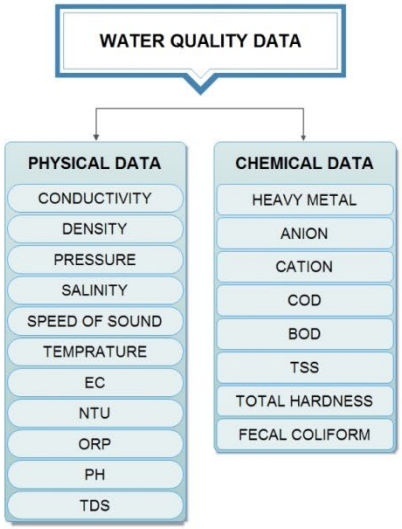
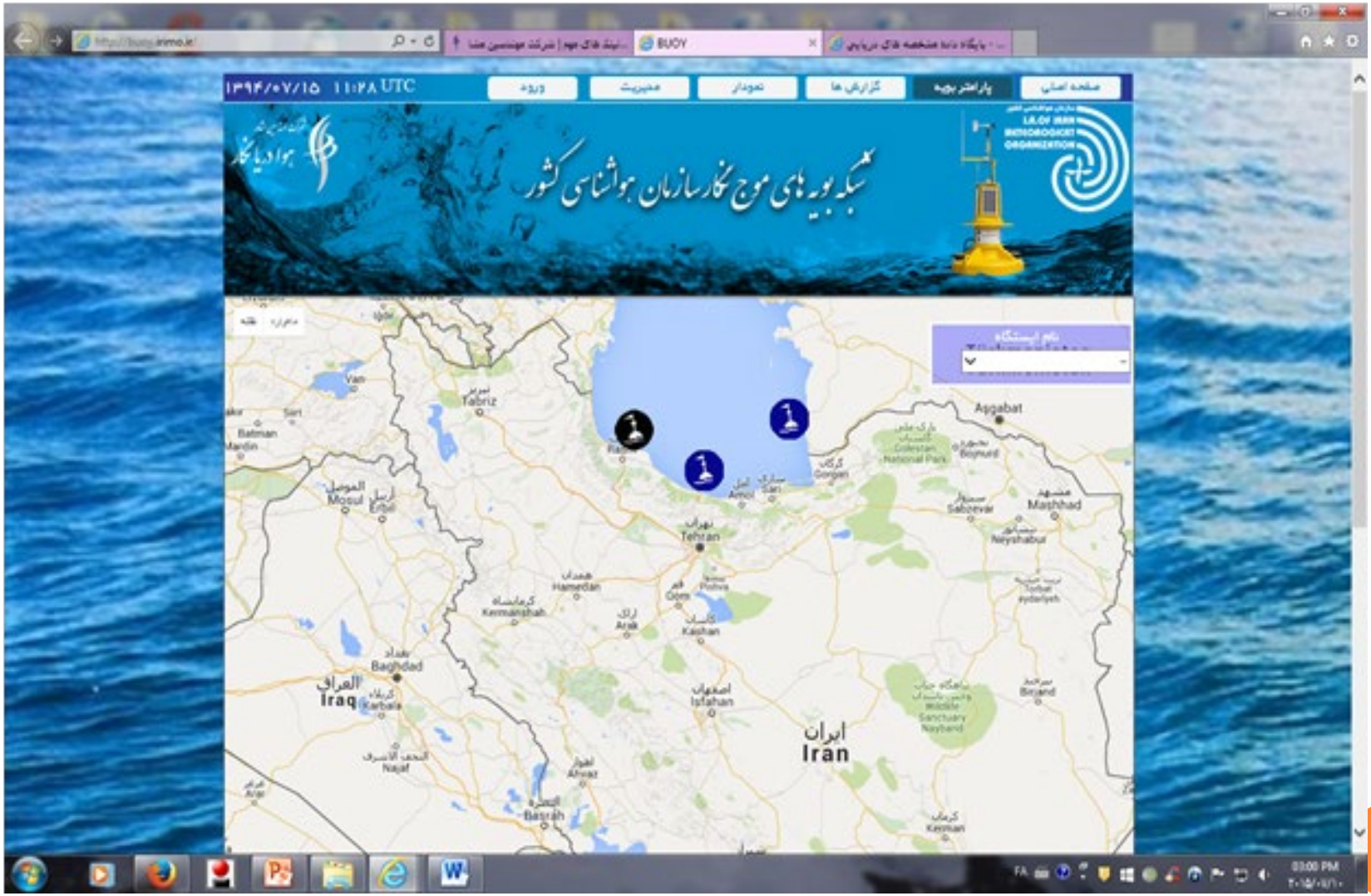
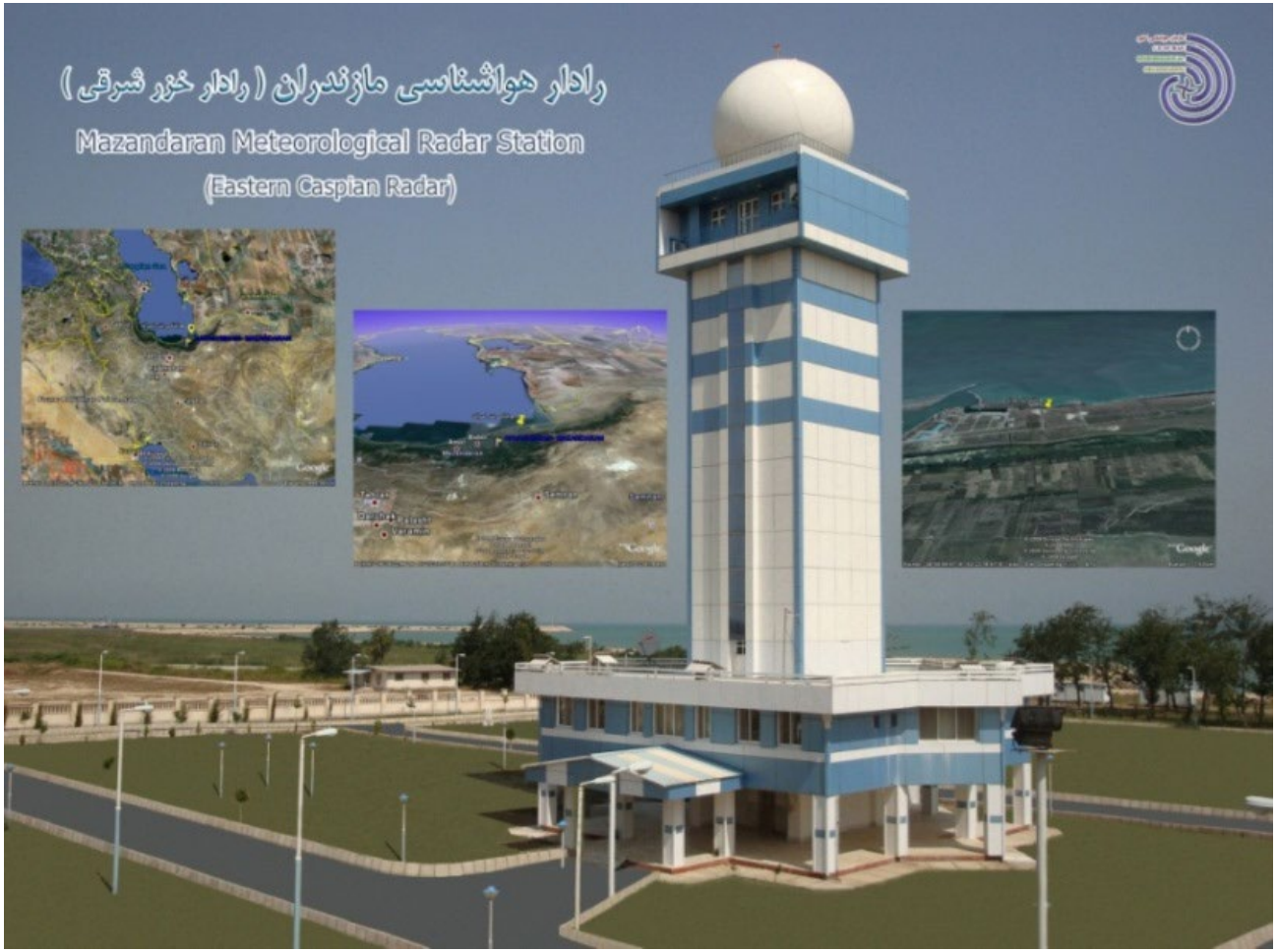


Fig.2- Locations of deployed buoys in south of Caspian Sea

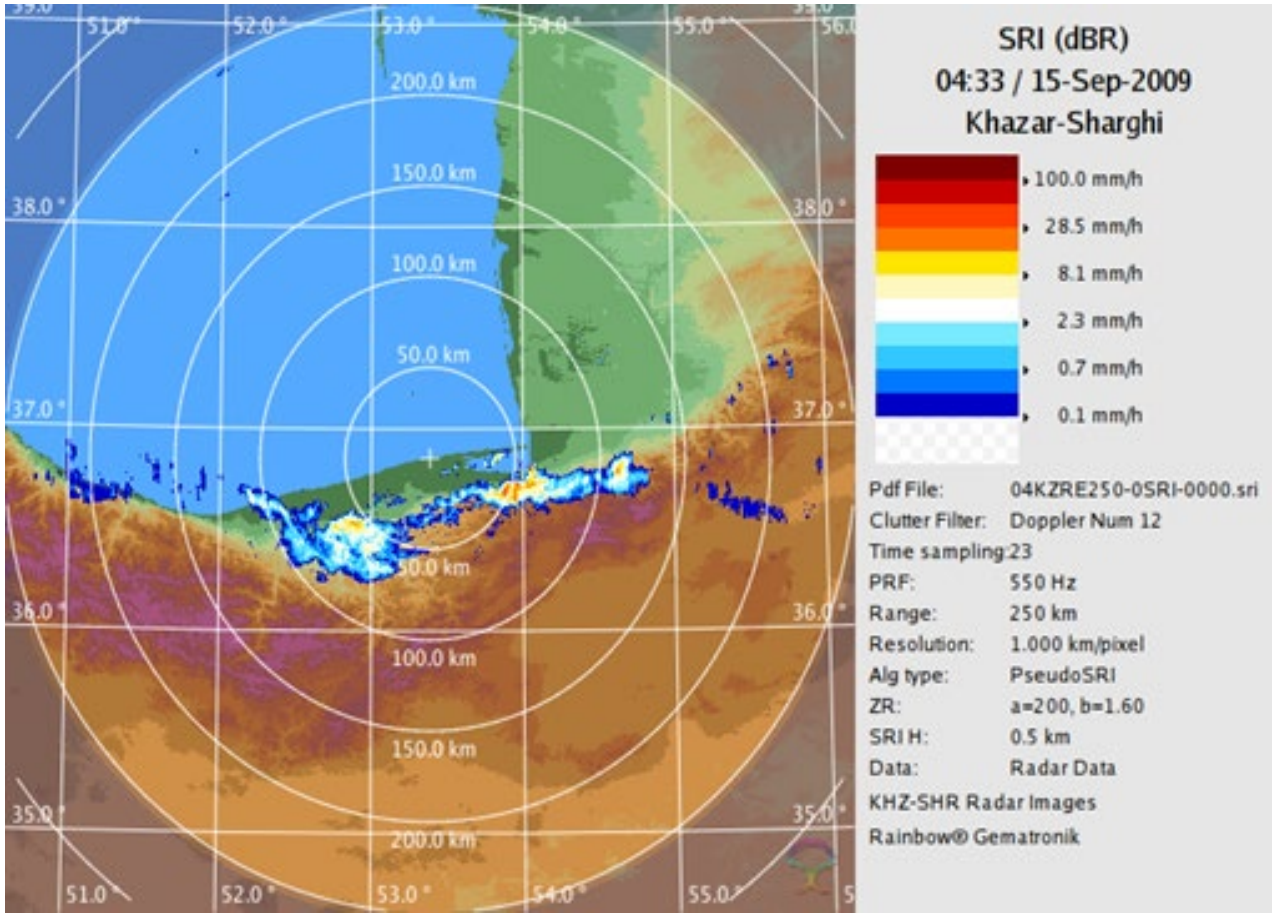
Wave recording buoys network of Meteorological Organization of Iran website Buoy.irimo.ir



Amirabad meteorological port radar



output of Amirabad RADAR

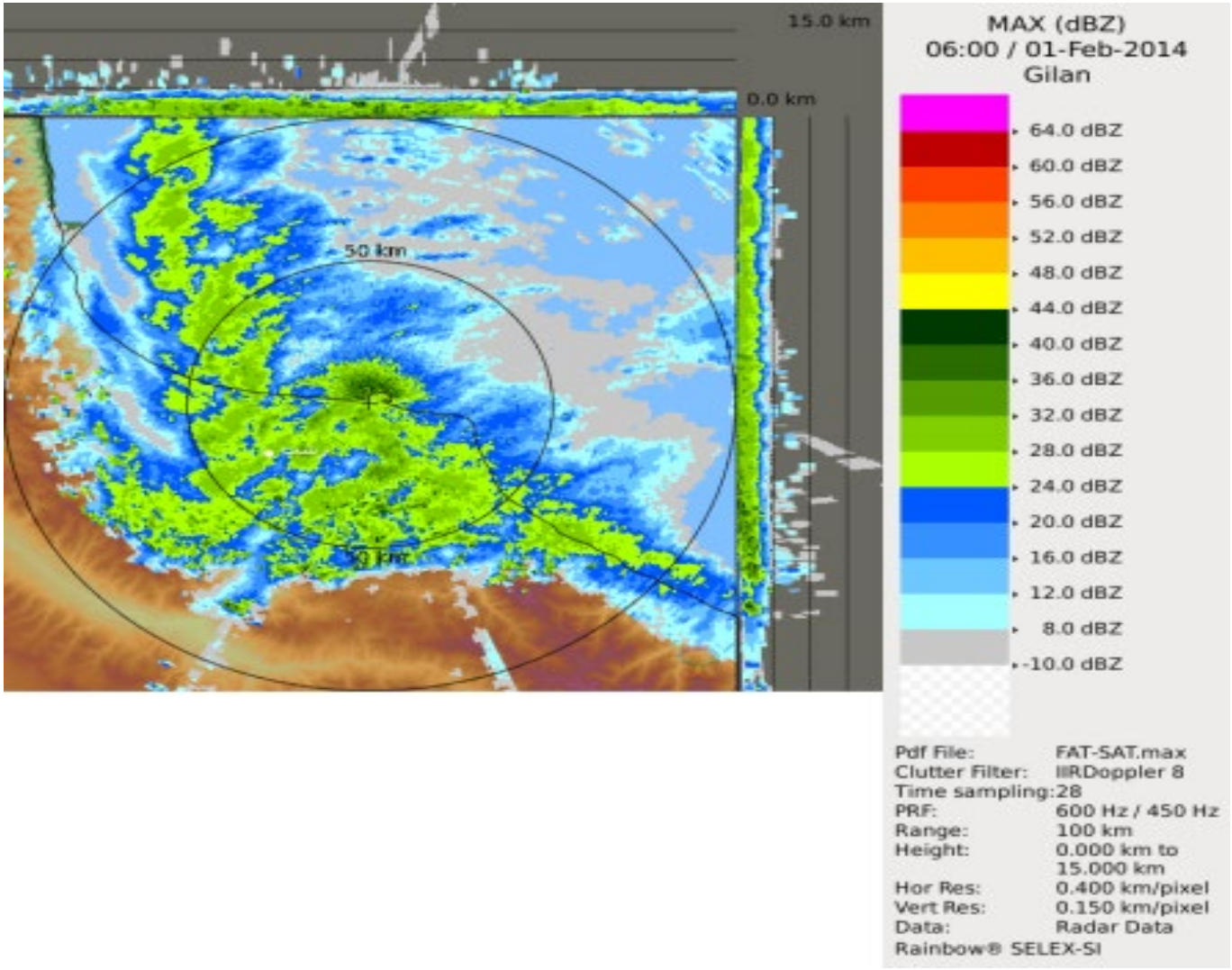


PICTURE OF KIASHAHR METEOROLOGICAL RADAR

SOUTHERN CASPIAN SEA RADAR NETWORK

It is of kind C-band RADAR which is an up to date one in IRAN

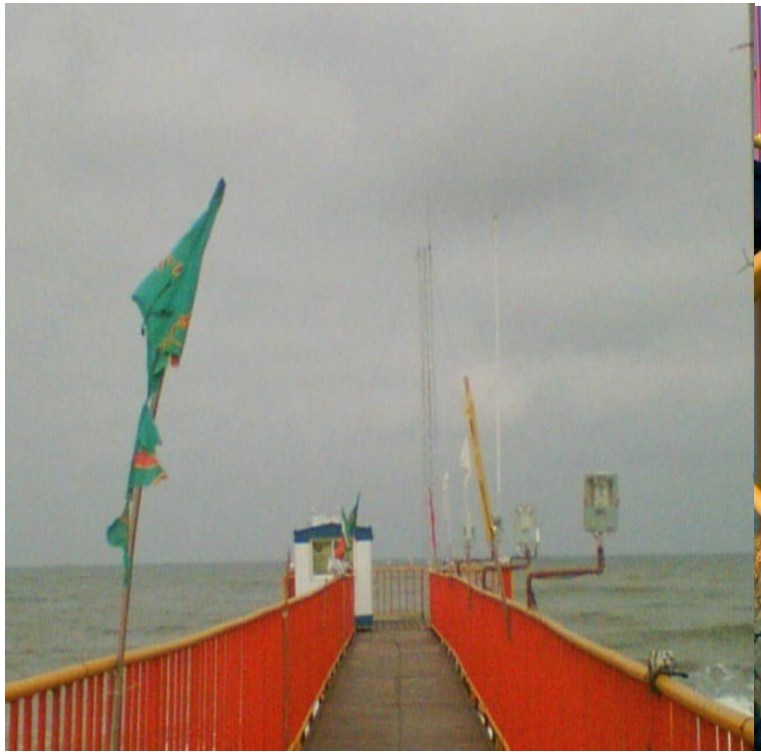
KIASHAHR RADAR AT TIME OF HEAVY SNOWFALL IN GUILAN

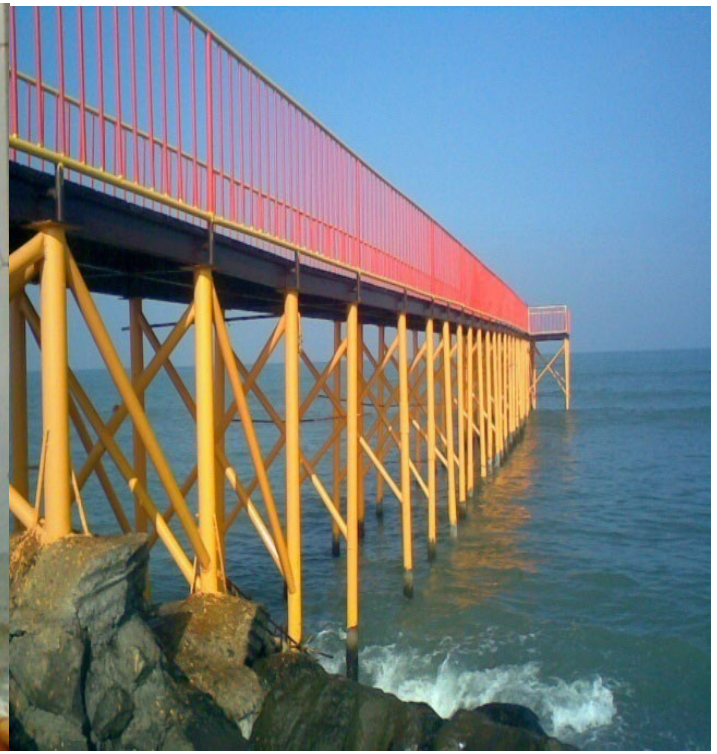


VIEW OF MARINE METEOROLOGICAL PLATFORM

a Doppler system of current profile and an automatic station on it

This current meter installed in 8 meter depth and in a location 800 m apart from platform





Guilan research vessel

Chapter 2

Marine weather prediction

Marine weather prediction

-12h, 72h, and 120 hours

-12h predictions are for:

2 time intervals 8AM to 20 and 20 to 8AM and

were send for southern center of Caspian Sea NAVTEX

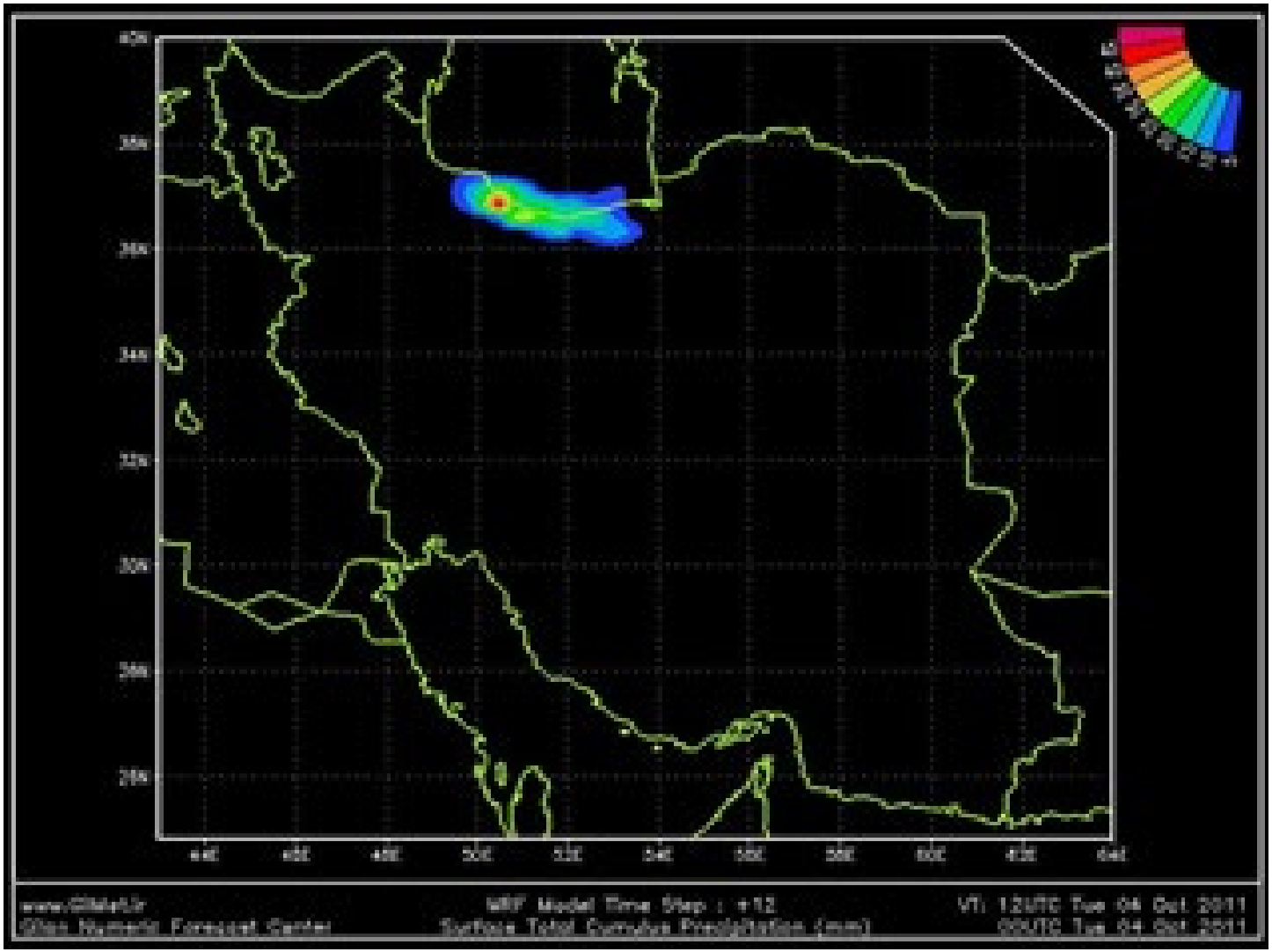
-Weather,horizontal visual range

-Maximum wind direction and speed near coast and offshore

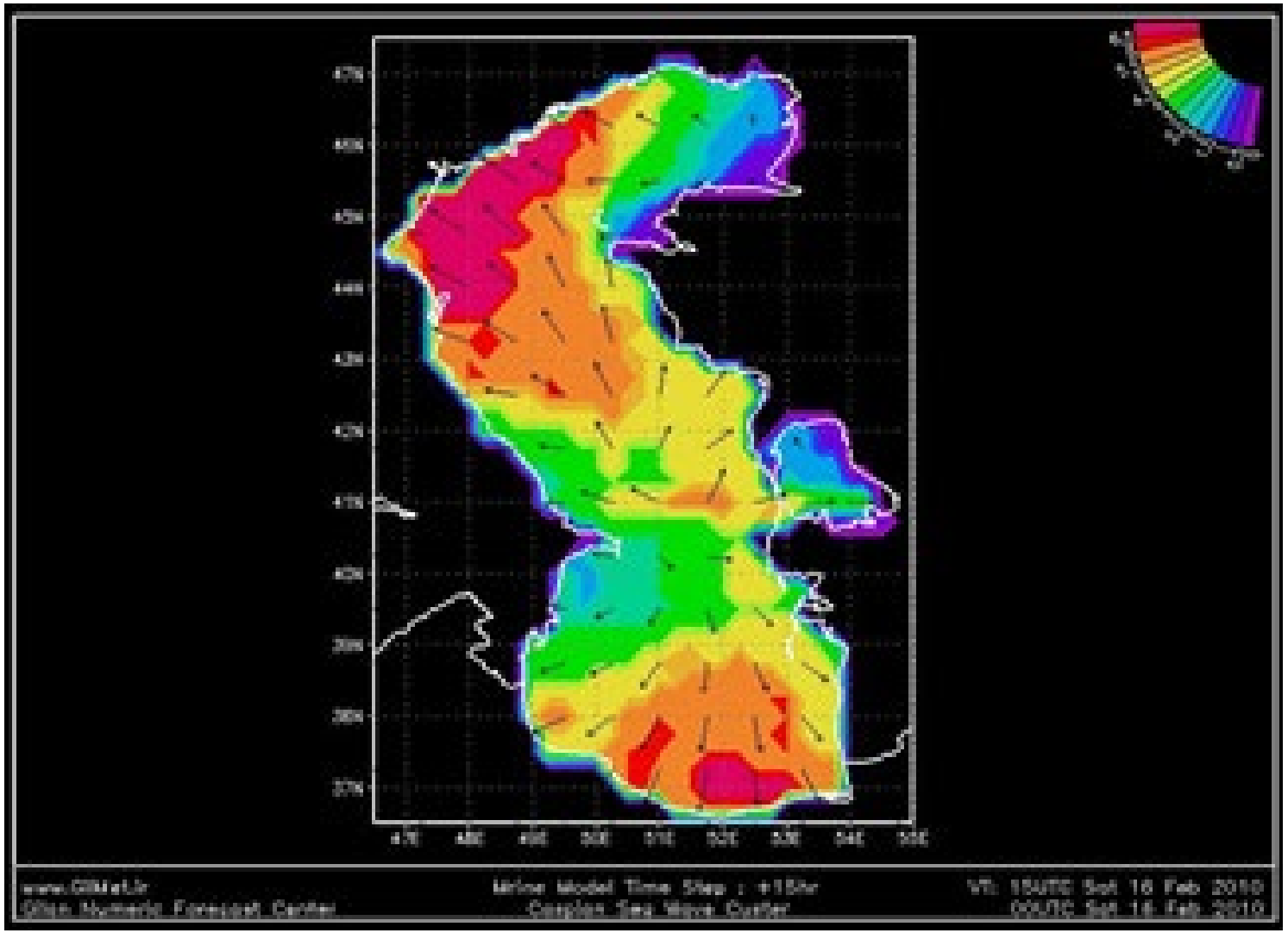
-Prediction of pressure and humidity variations for future 12h depicted

DEPICTED LOCATIONS FOR MARINE WEATHER FORECAST IN IRANIAN COASTS

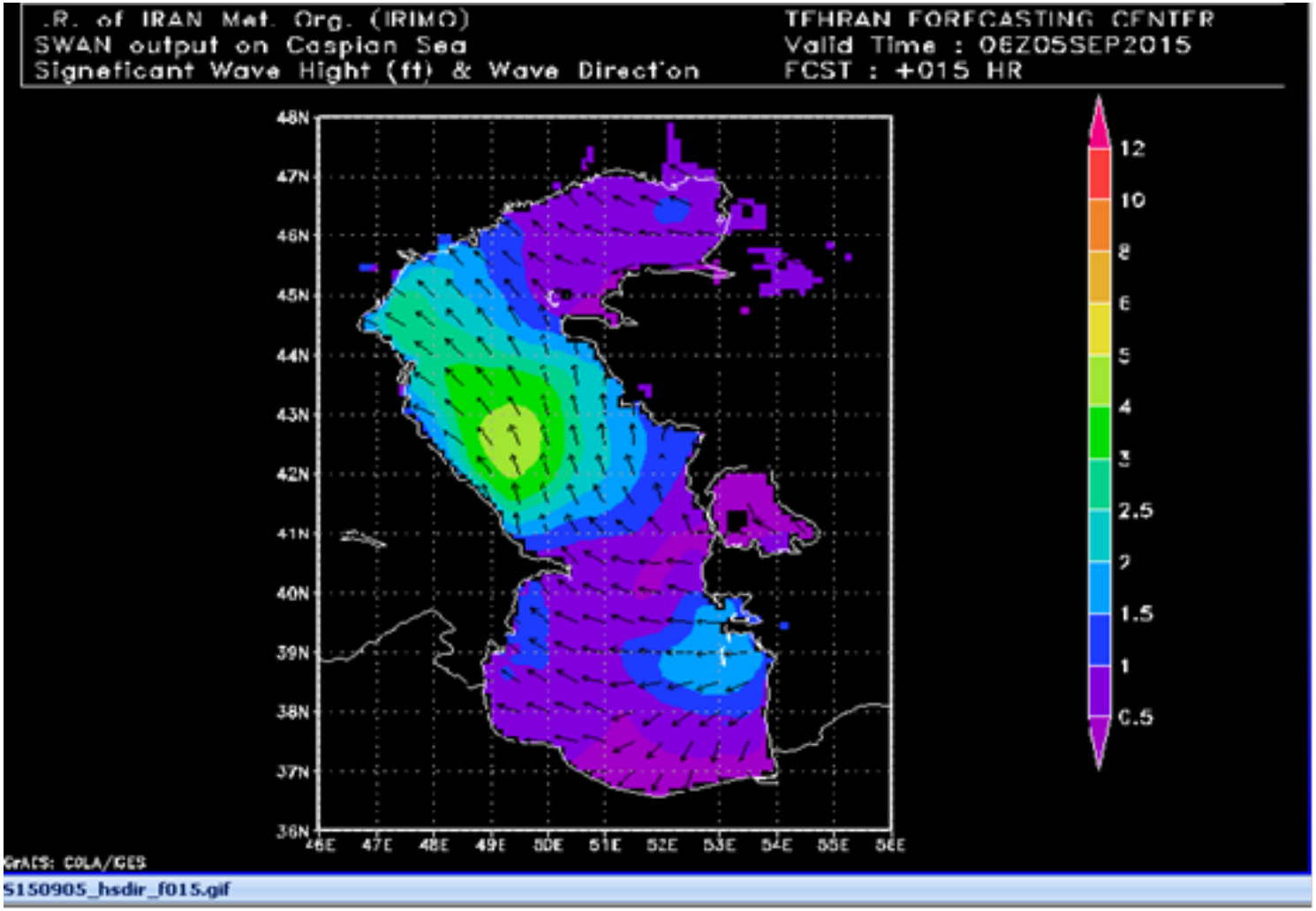
WRF model prediction – precipitation



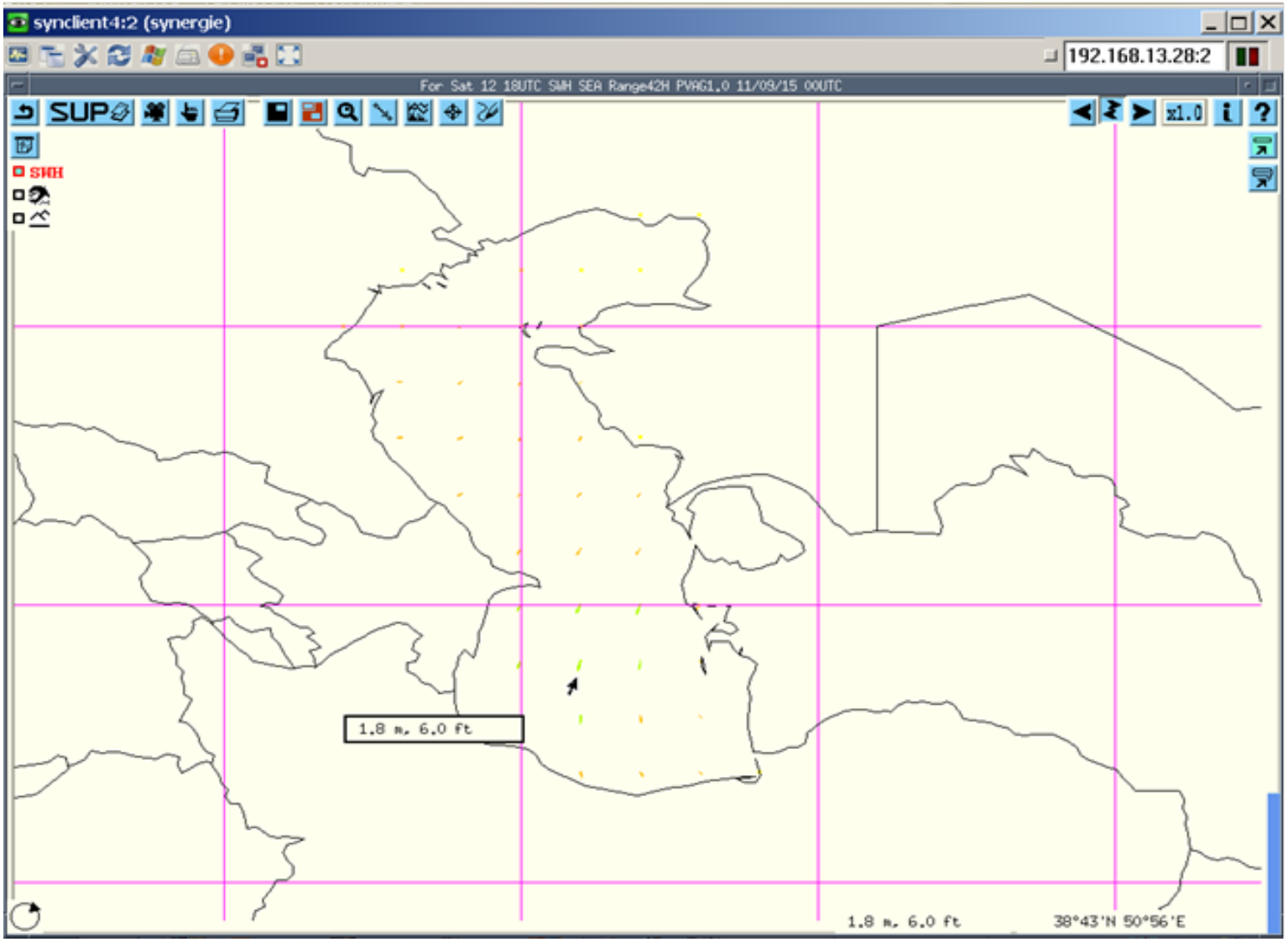
SWAN MODEL PREDICTION- WAVE HEIGHT AND DIRECTION



The main wave height for forecasting 9 hours by output model in the Caspian Sea



The main wave height of forecast 12-hour by output model VAG in the Caspian Sea



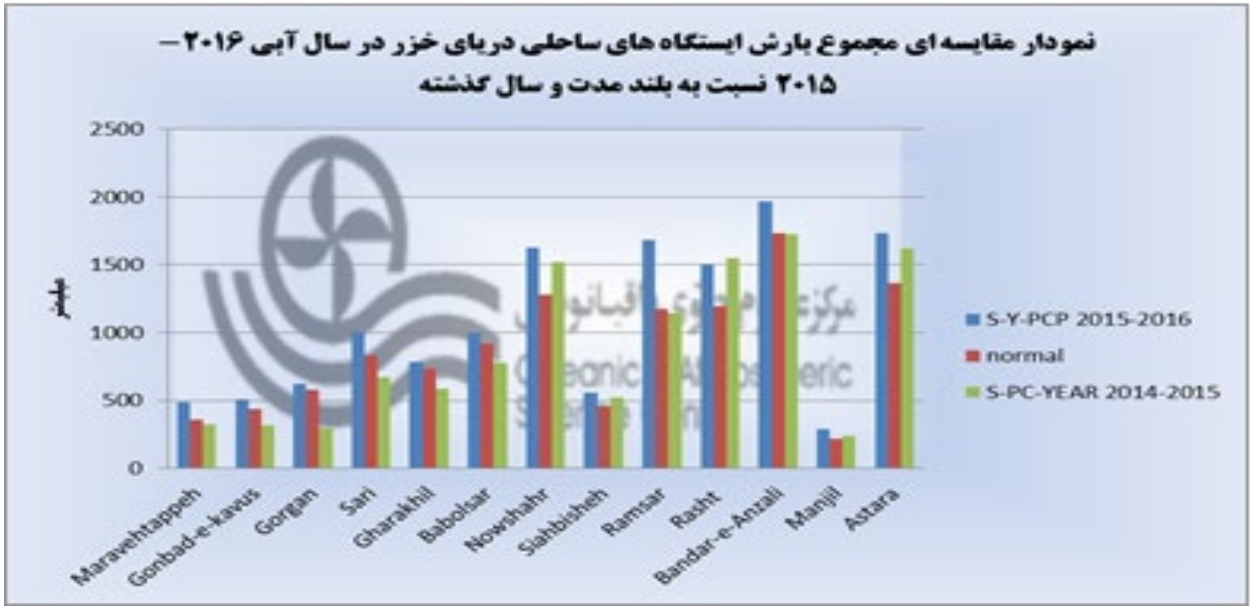
Chapter 3

Research Activities

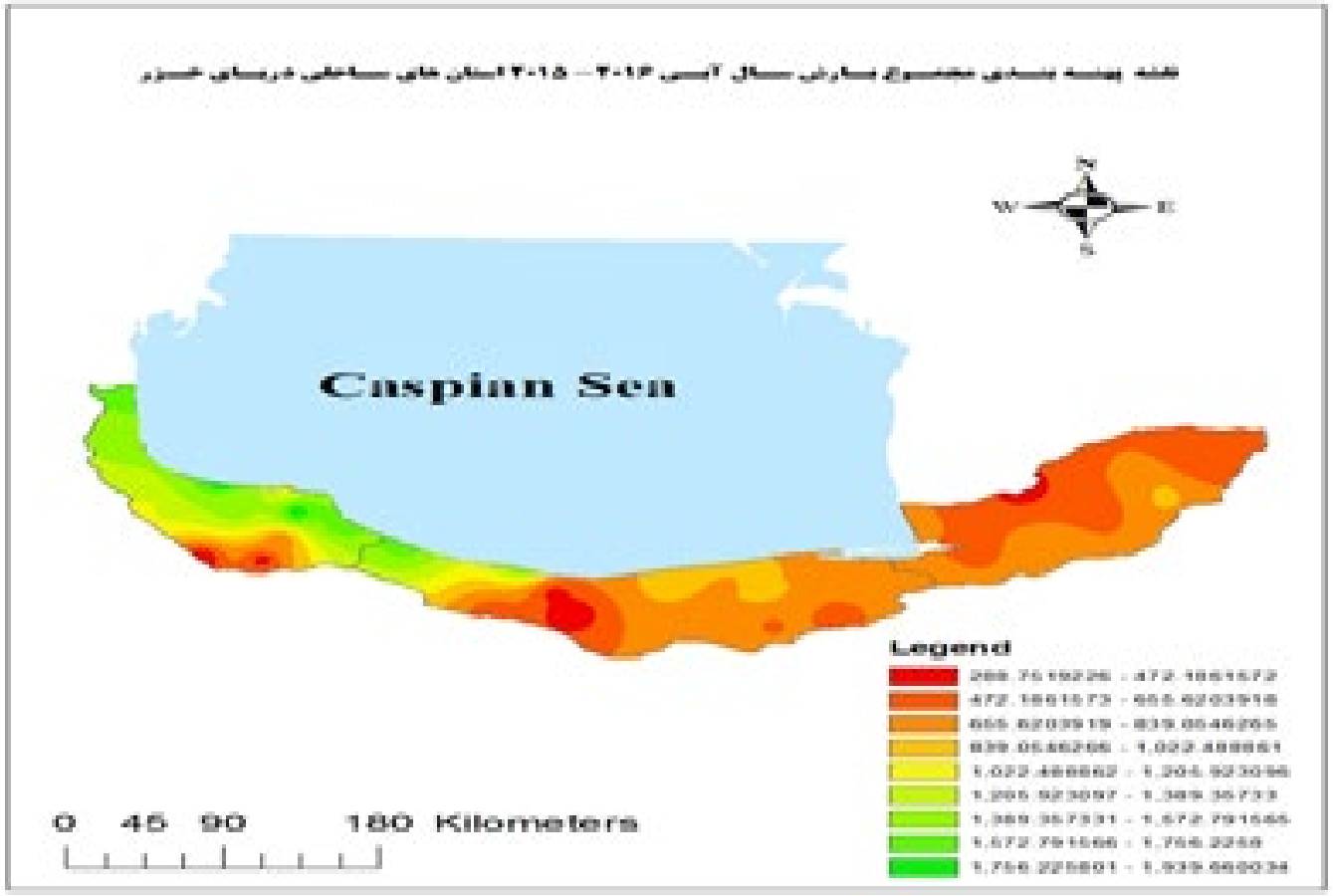
Climatic report of southern Caspian coasts

Southern Caspian sea precipitation study 2015-2016

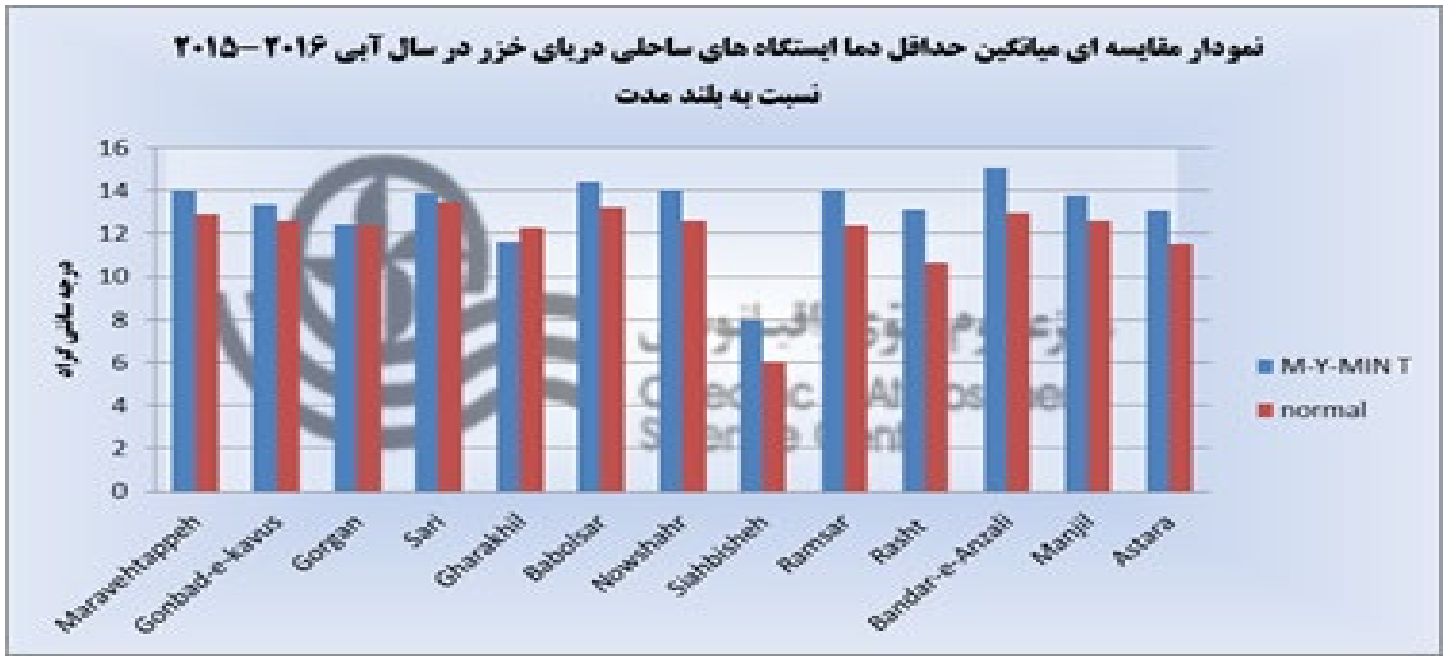
Studies show that precipitation distribution in current hydrological year has increased relative to long term values and past year. Maximum reported precipitation for stations Maraaveh tappeh, Ramsar, and Anzali were 484.6 ,1681.4, and 1967 mm respectively.



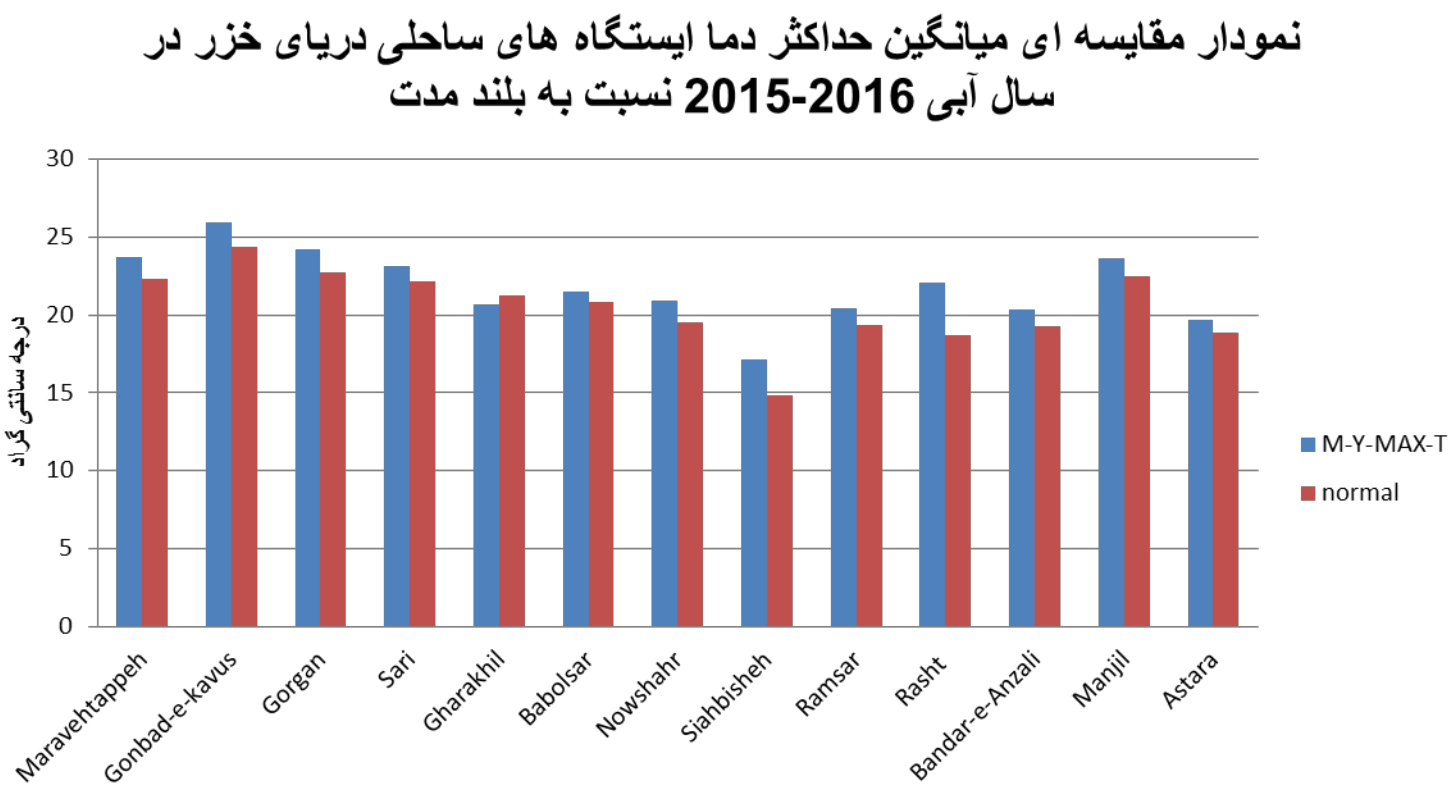
- Comparison diagram of total precipitation of coastal stations in hydrological year 2015-2016


Caspian Sea
N
W
E
S
Legend
0 45 90 180 Kilometers

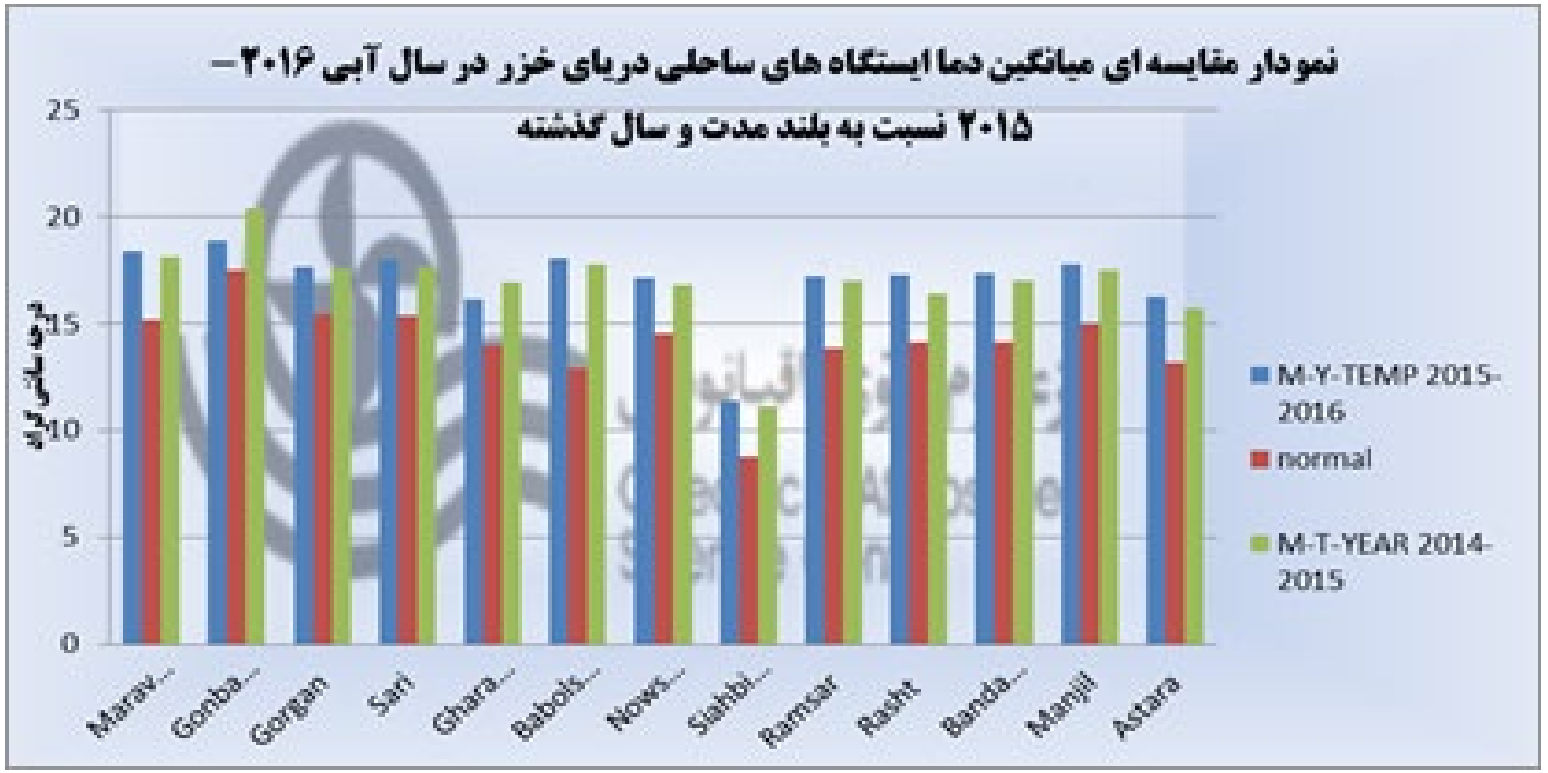
- Study of temperatures in southern coasts of Caspian Sea
- According to diagrams of maximum and minimum temperatures, in all stations but Gharaakhil maxima and minima temperatures have notable rises relative to their long term values.



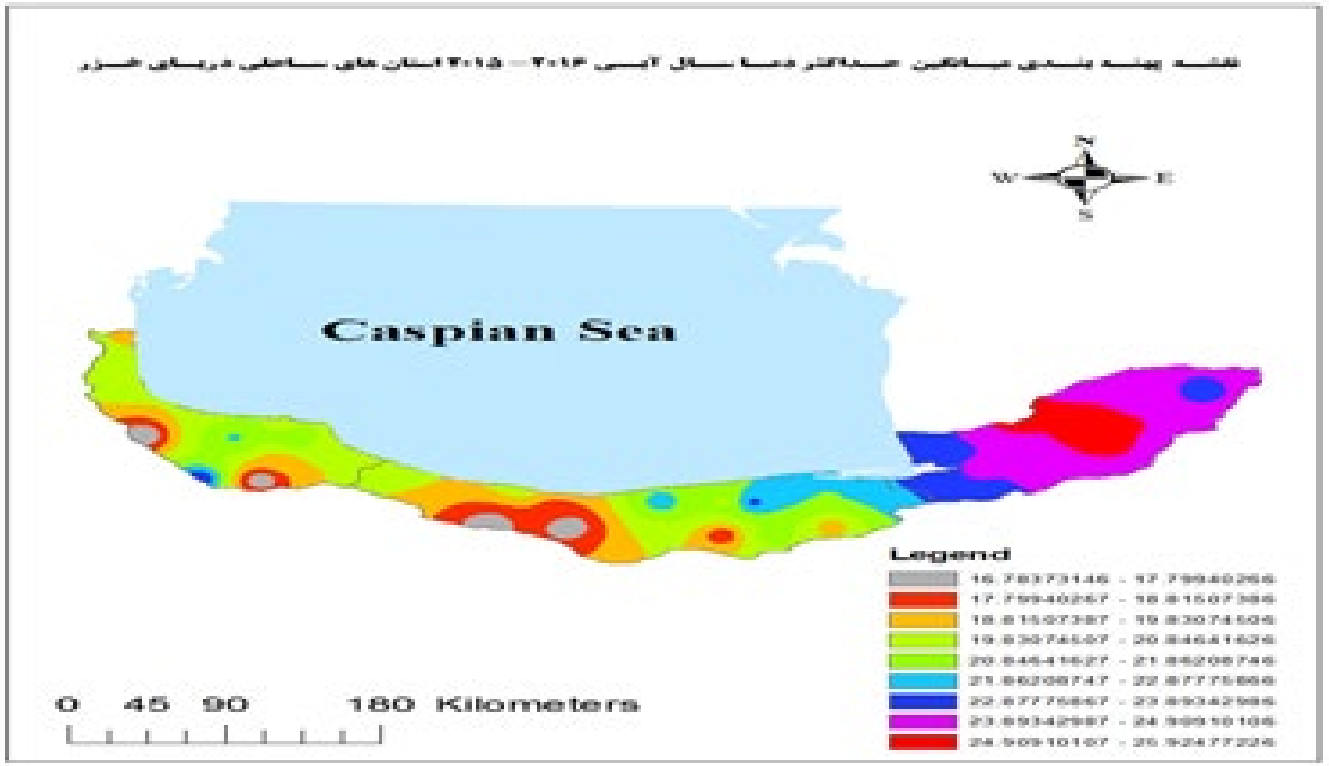
Comparison diagram of mean of minimum temperatures of coastal stations of south Caspian Sea in hydrological year 2015-2016 relative to long term values.



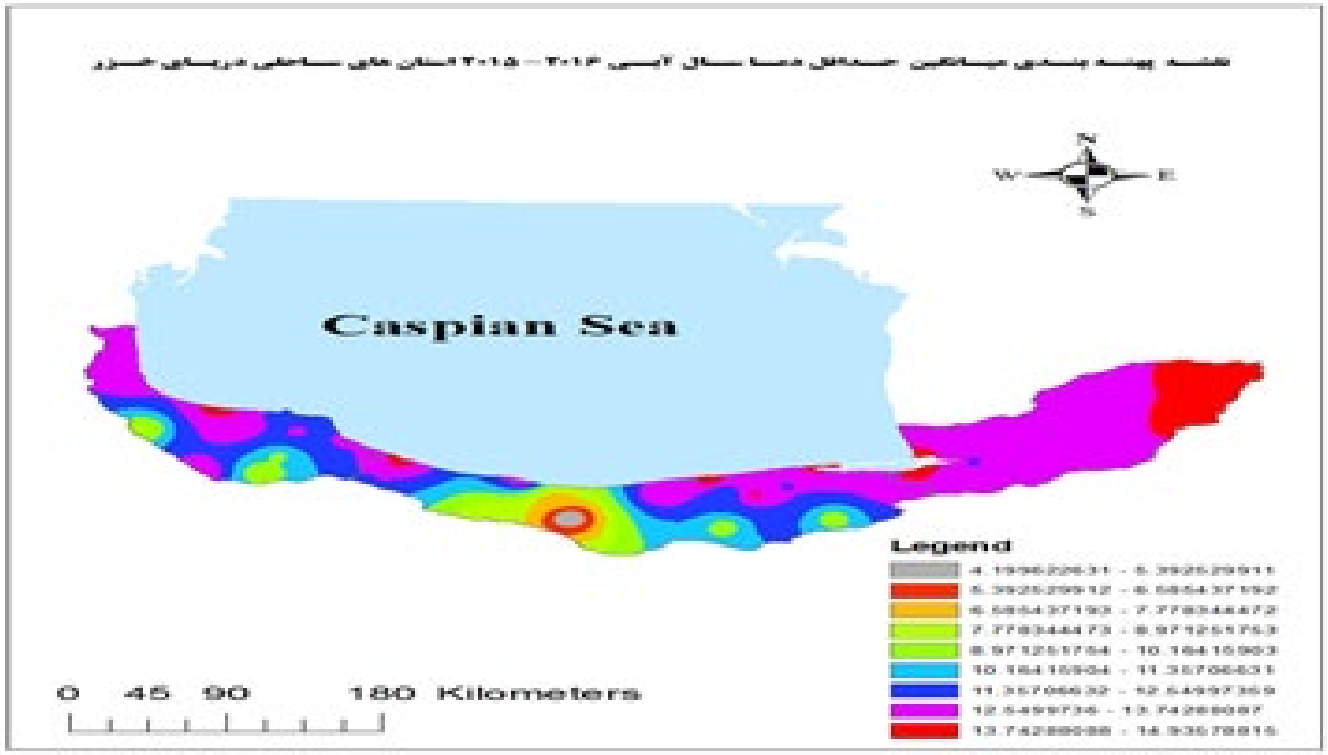
Comparison diagram of means of maximum temperatures in Caspian coastal stations In hydrological year 2015-2016 relative to long term values.



- Comparison diagram of mean temperatures of coastal stations of Caspian Sea In hydrological year 2015-2016, relative to long term and past year.

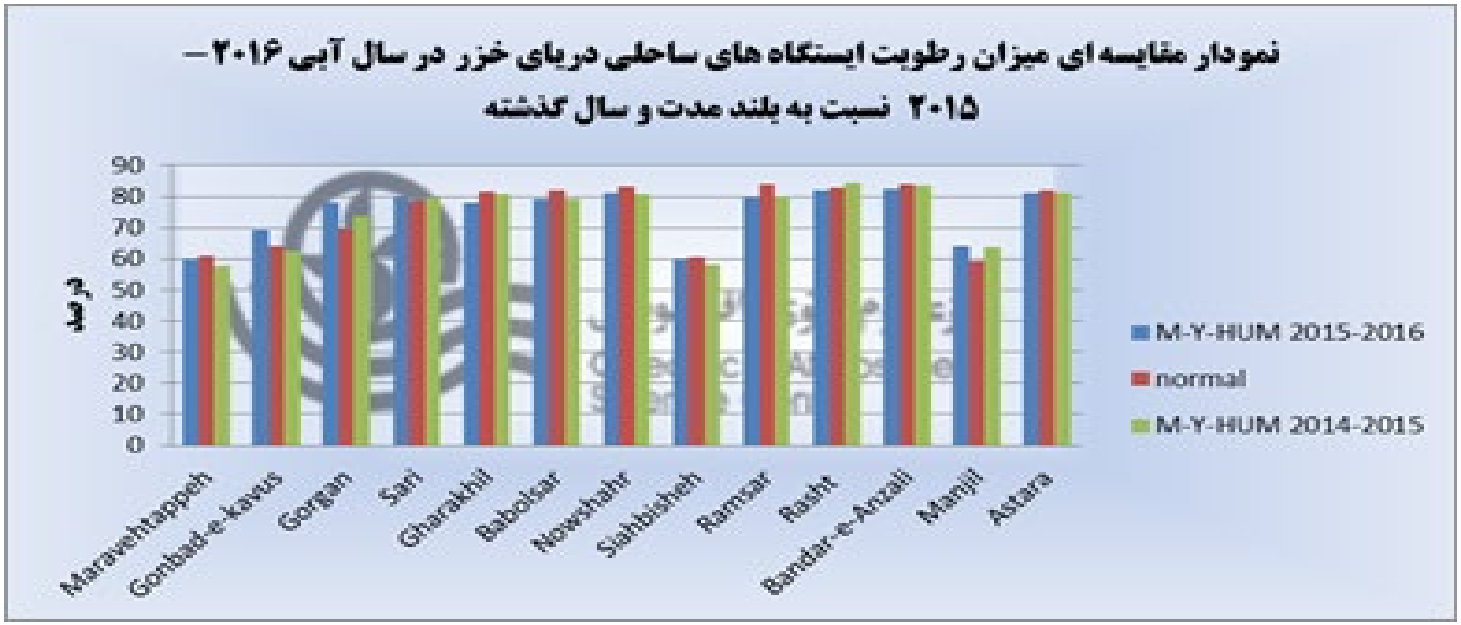


Map of mean of maximum temperatures in hydrological year 2015-2016 in coastal stations of Caspian Sea

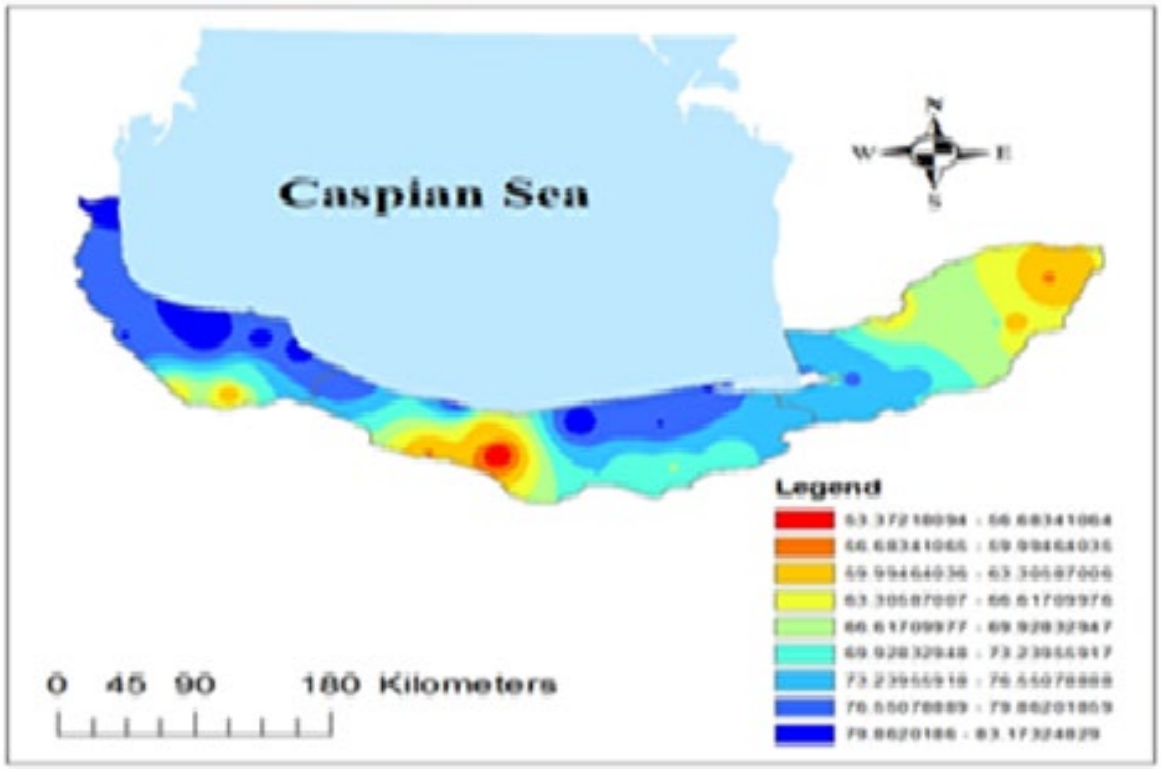


Map of means of minimum temperatures of coastal provinces of Caspian Sea in hydrological year 2015-2016

- Study of humidity in stations of southern coasts of Caspian Sea



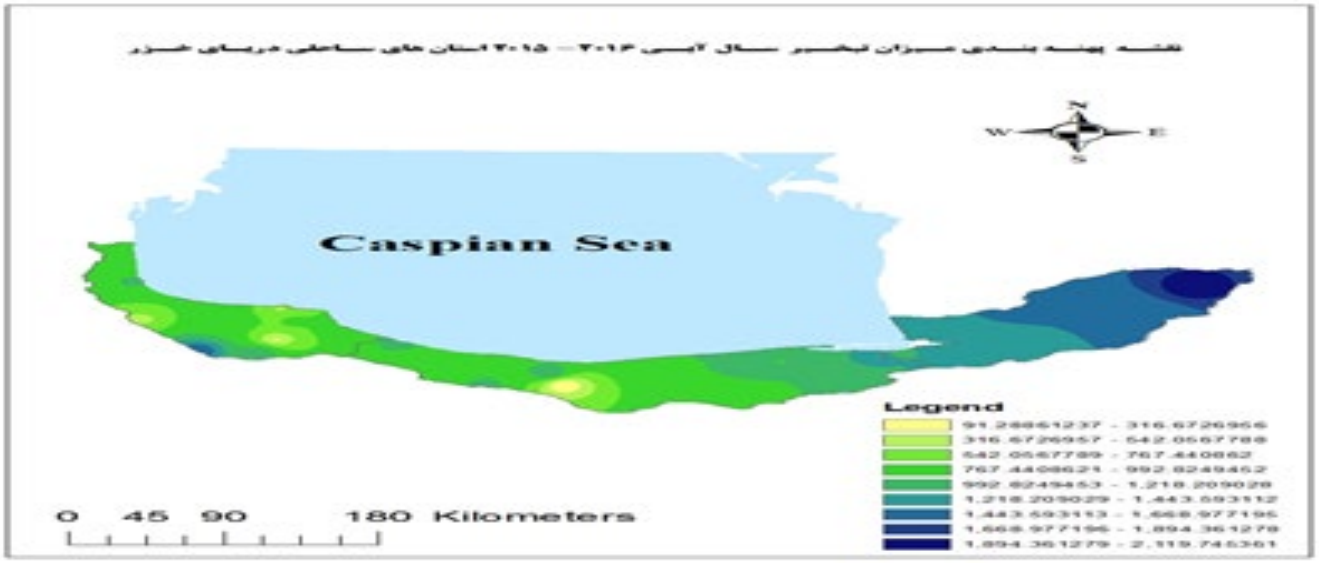
Comparison diagram of humidity amounts of coastal stations of Caspian Sea in hydrological year 2015-2016 relative to long term values and past year.

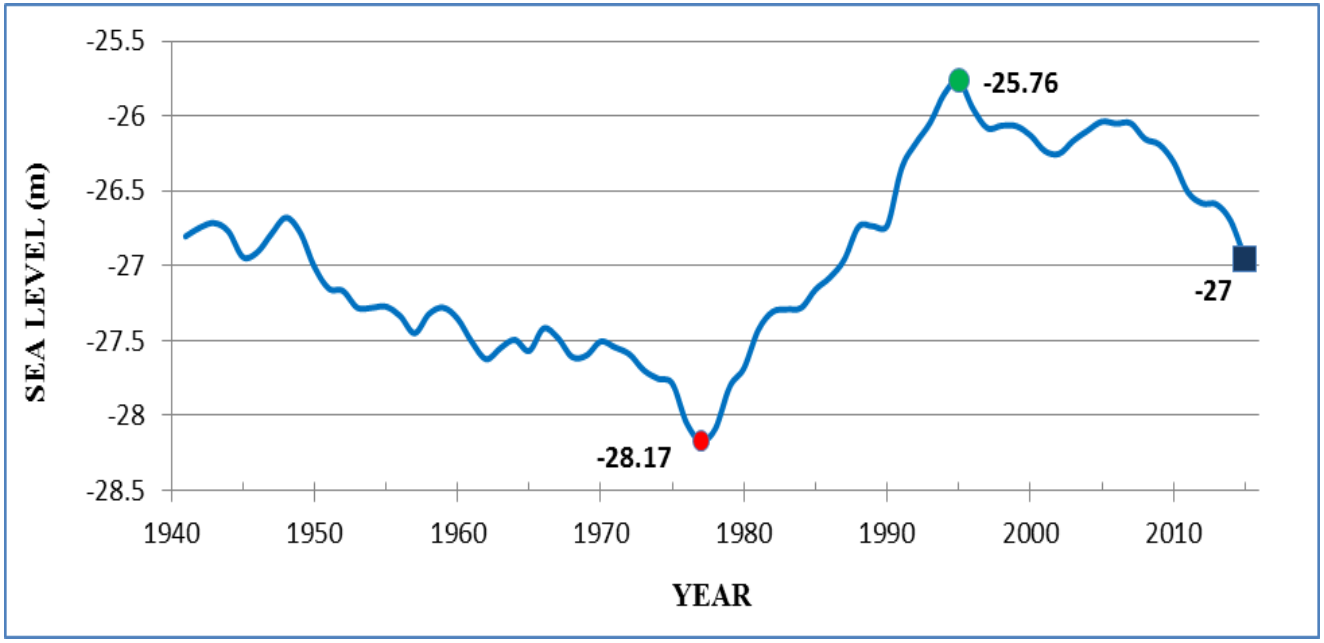


Map of humidity distribution in coastal provinces of Caspian Sea in hydrological year 2015-2016

- Study of evaporation in southern coasts of Caspian Sea stations
- In current hydrological year, evaporation rates have no notable changes relative to long term values. But in Manjil station evaporation rate has notable reduction relative to its past year value. According to map of evaporation distribution, in eastern parts of Caspian Sea coasts (in Iran) which has warmer temperatures, evaporation rates are higher than central and western parts.


نمودار مقایسه ای میزان تبخیر ایستگاه های ساحلی دریای خزر در سال آبی ۲۰۱۶-۲۰۱۵ نسبت به بلند مدت و سال گذشته
میلیمتر
2500
2000
1500
1000
500
0
Maravehtappeh
Gonbad-e-kavus
Gorgan
Sari
Gharakhil
Babolsar
Nowshahr
Siahbisheh
Ramsar
Rasht
Bandar-e-Anzali
Manjil
Astara
S-Y-E 2015-2016
normal
S-EVE-YEAR 2014-2015


Caspian Sea
Legend
0 45 90 180 Kilometers



Caspian Sea level situation from 2008 to 2015 based on information obtained from level measuring stations in southern coasts of Caspian Sea.

Caspian Sea level and hydrological stations data bank

Year	Sea level (m)	Sea level decrease rate	Mean sea level change (per month)	Maximum sea level decrease in
2008	-26.14	13	6	September
2009	-26.22	8	5	June & September
2010	-26.32	10	5	August
2011	-26.52	20	6	September
2012	-26.57	5	6	October
2013	-26.57	0	6	June to October
2014	-26.72	15	5	August
2015	-27.01	29	7	September

Chemical properties of water in southern coasts of Caspian Sea

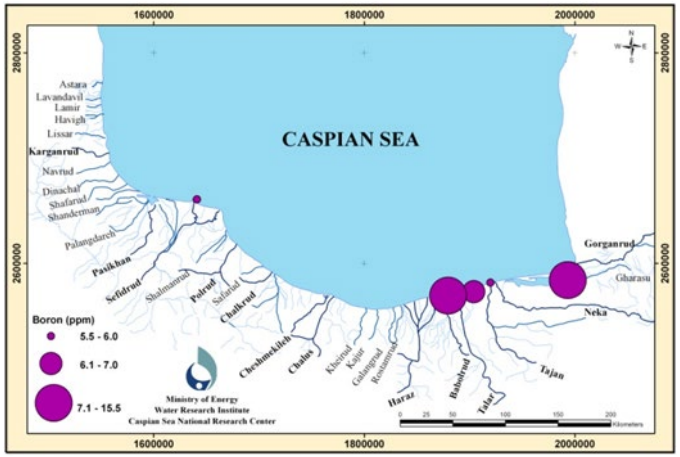

AZERBAIJAN
TURKMENISTAN
CASPIAN SEA
IRAN
TOC
Less than 5 ppm
5-11 ppm

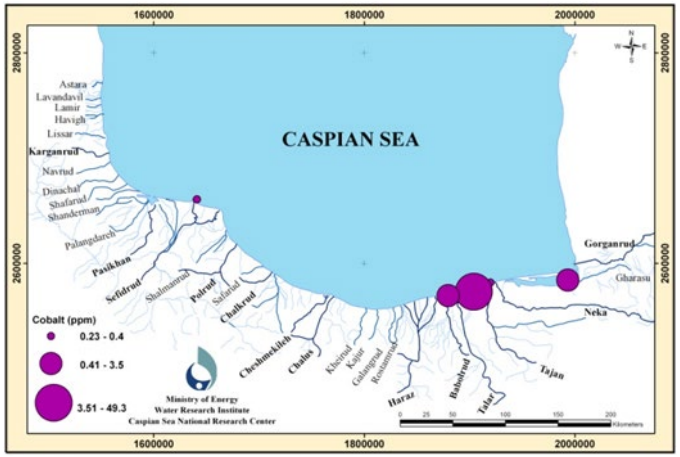

AZERBAIJAN
TURKMENISTAN
CASPIAN SEA
IRAN
Total Hardness
Less than 2000 ppm
2000-3000 ppm
3000-4500 ppm

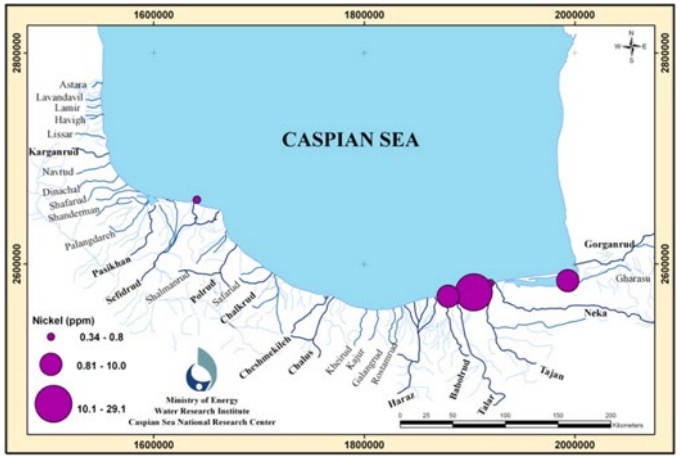

AZERBAIJAN
TURKMENISTAN
CASPIAN SEA
IRAN
NH4+
Less than 0.8 ppm
0.9-2 ppm
2-4.6 ppm

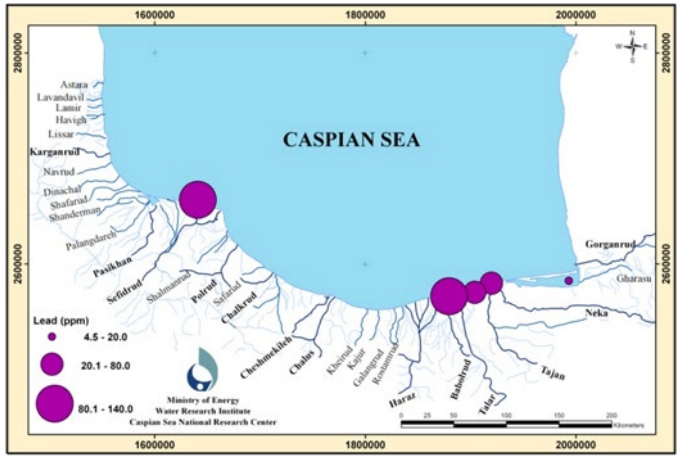

AZERBAIJAN
TURKMENISTAN
CASPIAN SEA
IRAN
Bromide
Less than 1.5 ppm
1.5-3.5 ppm
3.5-4.5 ppm

- Heavy metals sediment distribution in river estuaries of southern coasts of Caspian Sea







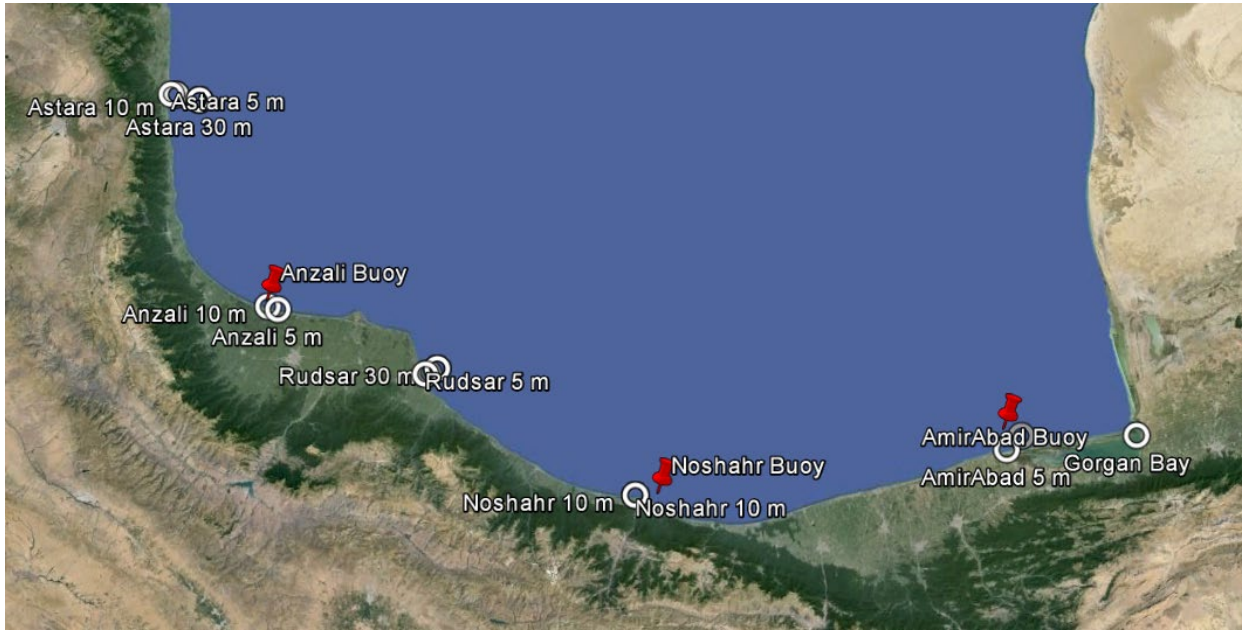


Monitoring and modeling studies of northern coasts of Iran

Project objectives

- Preparation of basic information required for coastal and port engineering
- Recognition of coastal and port problems in the study area and investigate relevant solutions
- Review and improvement of the findings from previous studies
- Study on the Caspian Sea water level changes

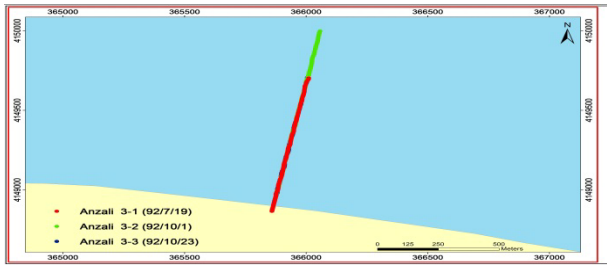
Field Measurements



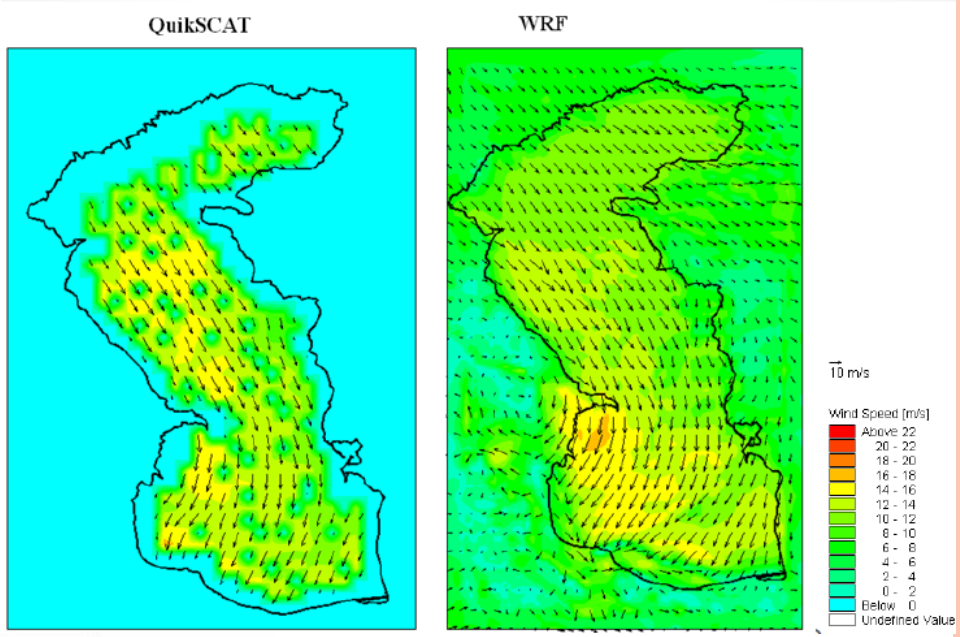
The installation position of ADCPs and Buoys

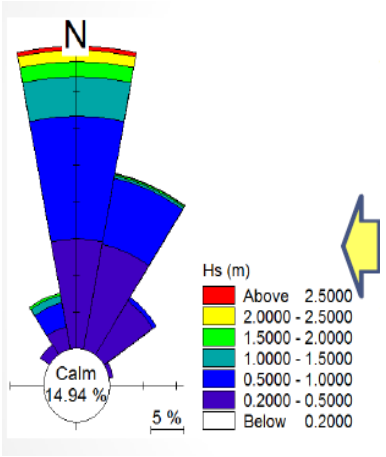
- Waves
- Current
- Sea level
- wind

SEABED PROFILES

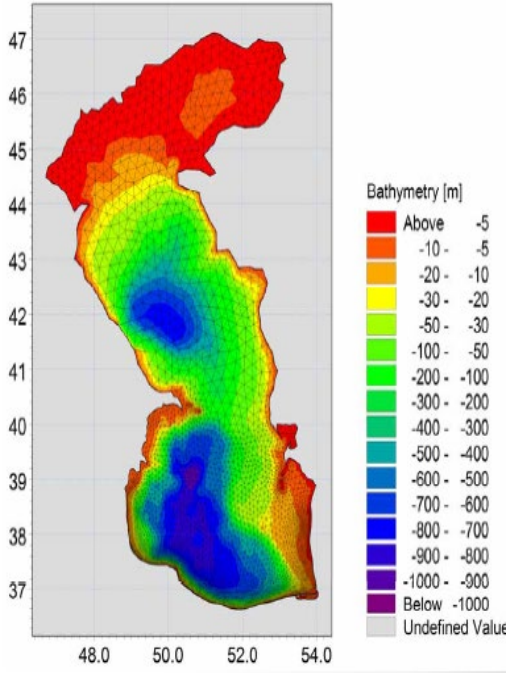


NUMERICAL MODELING





Wave rose of simulation in Noshahr port



Chapter 6

Marine Meteorological Data Bank

40881 11957 02908 10360 20236 39925 49949 51015 60003 70700 222// 00318 20402 333 30028 50821
70000= LAWAN
40857 12965 03606 10332 20245 39973 49983 52008 60001 90550 222// 00/// 20302 333 30027 50841
70000= BOUSHEHR
40890 11545 31804 10328 20288 39936 49941 52010 60003 71010 81430 90545 222// 00312 20302 333
30031 50680 70000 81630 83360= ABOU MOUSA
40889 12960 00404 10338 20290 39943 49948 52009 60003 90545 222// 00316 20500 333 30030 50661
70000= SIRI
40898 11950 00906 10344 20276 39959 49968 53006 60001 70710 333 30030 50880 70000 222// 00308
10802= CHABAHAR
40893 11950 00910 10344 20299 39947 49953 51012 60001 70700 222// 00335 20401 333 30032 50810
70000= JASK
99688 11935 01305 10340 20303 39933 49940 51006 60003 71000 90545 222// 00332 20501 333 30031
50671 70000= BANDAR LENGE
99675 11930 02104 10334 20313 39940 49951 51010 60003 71021 90545 222// 00316 20301 333 30030
50511 70000= GHESHM

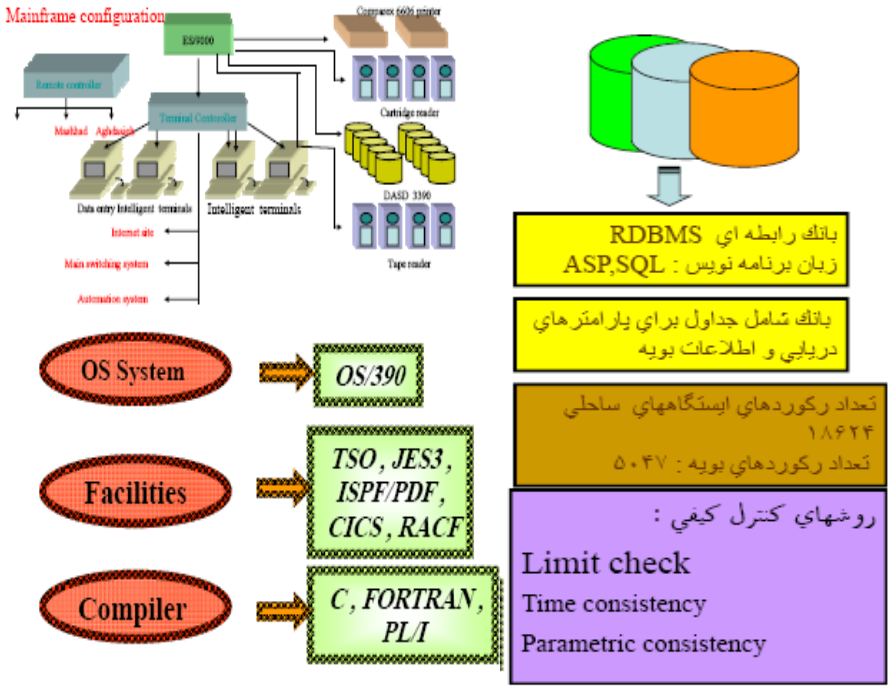
Digital form about the water temperature, wave period and wave height

Observed Parameters in Marine Stations

No.	Name	Unit	Graph	Observation(24hourly)
1	Wind direction	degree	*	*
2	Wind speed	m/s	*	*
3	Air pressure	Hp	*	*
4	Air temperature	C	*	*
5	Sun	W/m2	*	*
6	Max temperature	C	*	*
7	Min temperature	C	*	*
8	Precipitation	mm	*	*
9	Wave heights	Cm	*	*
10	Wave period	S	*	*
11	Water temperature	C	*	*
12	Water Current	m/s	*	*

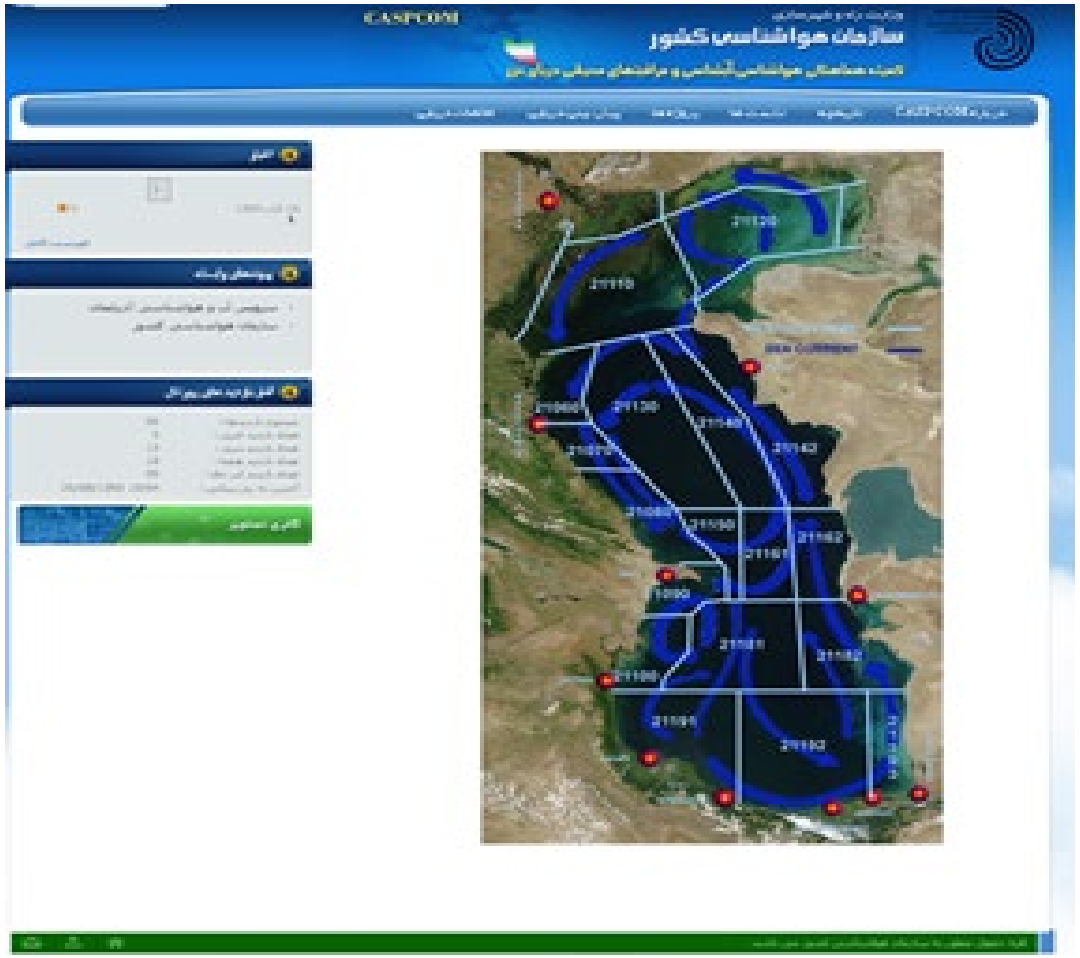
Structure of Marine Information Bank

The structure of marine data bank which records number and quality control methods have been shown.



CASPCOM Website Design

The Website http://caspcom.irimo.ir has been designed for the purpose of providing information of Hydrometeorology and Monitoring of the Caspian Sea Working Group in Tehran



Development of Applied Marine Meteorology

Iranian “TAHAK” system

Optimum use of existing facilities actually must be noticed integrally regarding fields of applicability of marine meteorological data. But obstacles like inadequate human resources, low level skill experts, deficiency of processing facilities, limitations of national monitoring network and discontinuity of observation data, causing limitations in marine meteorological services

- To prevent quality and quantity loss of marine meteorological data, atmospheric natural disaster effects reduction, improving alarm and warning systems, preventing time waste, loss of energy and funds because of weak efficiency of experts in marine meteorological products, it is important to develop marine meteorology system in applied fields. This system which must have two-sided connection with end users will have following sections:
- Identifying end users
- Assessment of needs
- Preparing data and products
- Systems of distribution data and production
- Capacity making
- Survey and feedback
- Documentation

Thanks to the patience

Oceanic and Atmospheric Science Center

Meteorological Organization of Iran

November 2016