I.R.IRAN NATIONAL REPORT for 25th session of Coordination committee of Hydrometeorology of Caspian sea (CASPCOM)

Astrakhan, Russia, 25 October 2021

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Oceanic & Atmospheric Science Centre

I. R. OF IRAN METEOROLOGICAL ORGANIZATION

In this report we talk about

Describes the development of the Maritime Meteorological Network in Gilan province

Caspian Sea National Day

Climate report of Caspian South Coastal 2020-2021

Numerical and provincial numerical prediction by Nested method on the southern coast of the Caspian Sea and its advantage over previous numerical prediction methods are described in the report.

1. **Development of measurement network in southwestern coast of Caspian Sea**

Marine meteorological stations

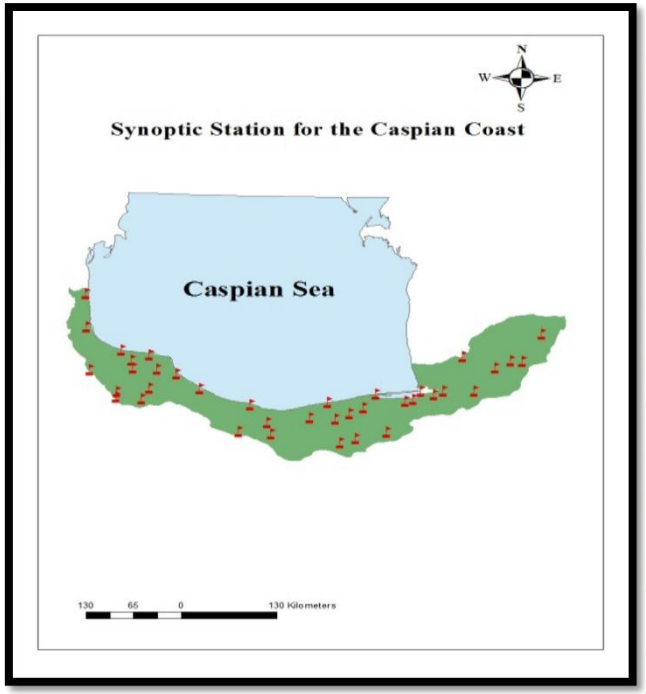
Monitoring of atmospheric conditions on the southwestern shores of Caspian Sea is carried out by using information from 6 stations those located in the coastal province of Gilan. Long-term climate fluctuations in this region are carried out using stations that are more then 30 years old that include stations in Anzali and Rasht. The program for improving and automation of this network is underway in coming years and 2 wind stations are installing in the Astara and Lisar. Figure 1 shows the master plan of coastal and marine stations for Gilan province.

Figure 1: Master plan of coastal and marine stations of Gilan province for complete observation of coast and sea: weather stations, Buoys, research light vessel and cameras.

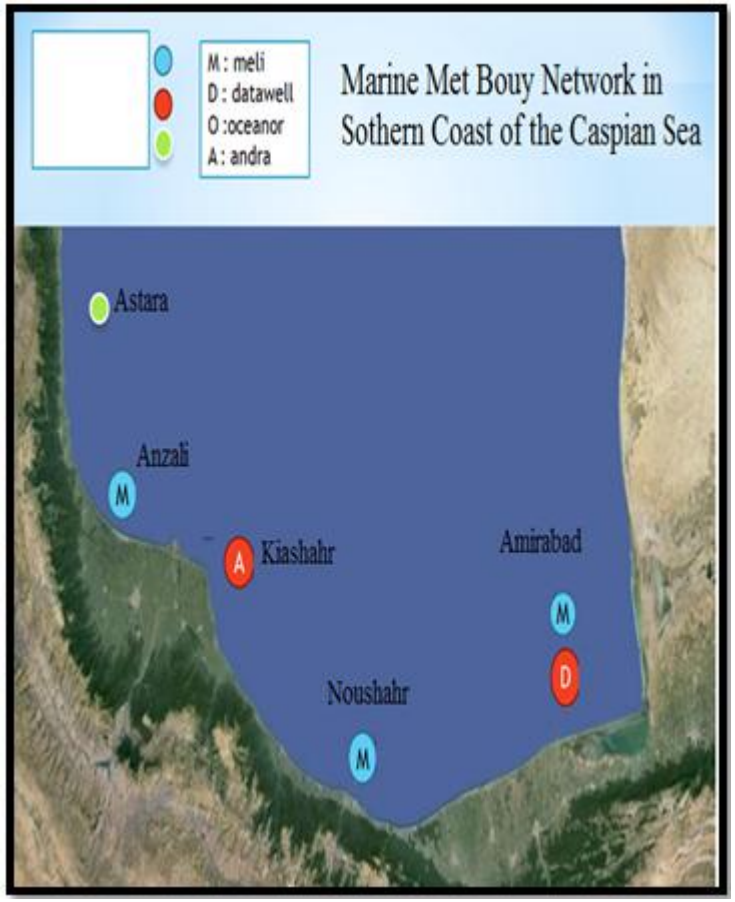
Master plan of coastal and marine stations of Gilan province for complete observation of coast and sea: weather stations, Buoys, research light vessel and cameras.

2.Development of measurement network in southern coasts of Caspian Sea

2-1- Coastal Marine Meteorological Network



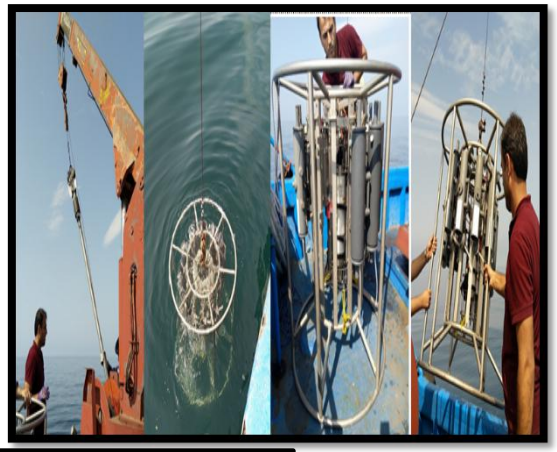
2-2-Marine Meteorological Buoys



Development of measurement network in southern coasts of Caspian Sea

Development of marine meteorology observation, Noor and Tonkabon, Mazandaran Province

Research cruise near Gilan Province



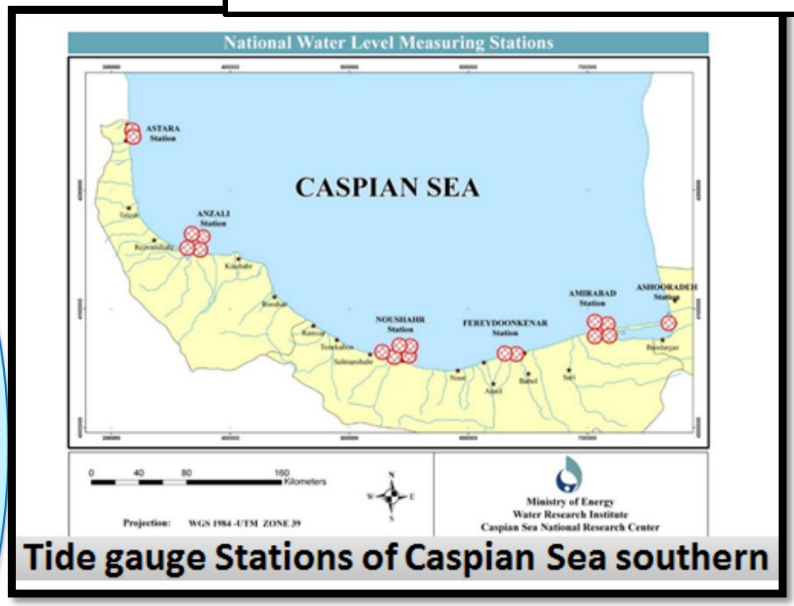
2-3- Meteorological Radar

Kiyashahr Meteorological Radar

Amir Abad Meteorological Radar

2-4- Caspian Sea Level monitoring network

Development of measurement network in southern coasts of Caspian Sea



Tide gauge Stations of Caspian Sea southern

2-5-River stations

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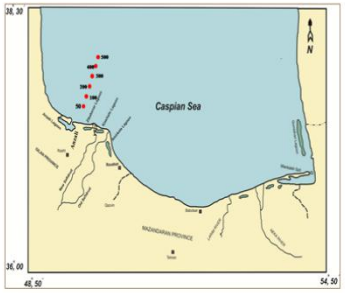
سازمان هواشناسی کشور
I. R. OF IRAN METEOROLOGICAL ORGANIZATION

Study and research

Deep water studies in the southern Caspian Sea

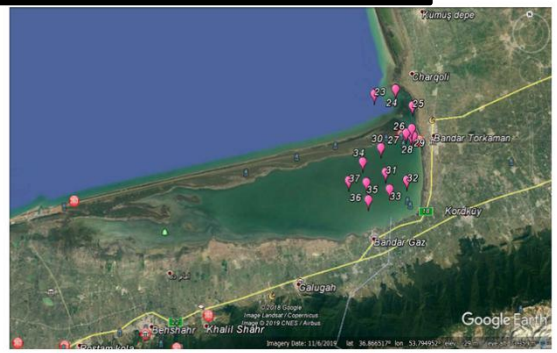
Biological studies
Phytoplankton
Zooplankton
Benthos
Chemical studies
Nutrients
Alkalinity
TOC
DO, pH and Chl-a
Geological studies
Sedimentology
Physical studies
Physical Parameters



Instrument: CTD- Plankton net- Grab- Niskin- Gravity Corer- Rosette

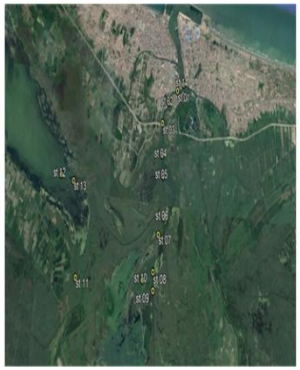
Monitoring of environmental parameters in Gorgan Bay

Biological studies
Phytoplankton
Zooplankton
Benthos
Nekton
Chemical studies
Nutrient
Alkalinity
TOC
BOD and COD
Chemical parameters
Geological studies
Grain size
Physical studies
Current
Physical parameters



Instrument: - RCM9- CTD- Hach portable probes- Plankton net- Grab- Niskin

Physical studies
Current
Temperature
Salinity
Chemical and Geological studies
Sediment and water samples



Instrument: - RCM9- CTD- Hach probes- Grab- Niskin

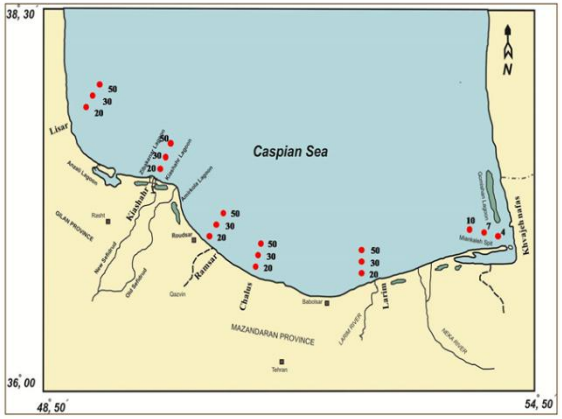
Monitoring of environmental parameters in Anzali Wetland

Biological studies
Phytoplankton
Zooplankton
Benthos
Nekton
Biological fouling

Chemical studies
Nutrient
Alkalinity
TOC
Sulfide, TN, TP, BOD and COD
Chemical parameters

Geological studies
Grain size
TOM and TOC in sediment
Sedimentation rate

Physical studies
Wave
Current
Physical parameters



Instrument: ADCP- RCM9- CTD-Sediment trap- Plankton net- Grab- Niskin

Near-shore Monitoring in the southern Caspian sea

Caspian Sea National Day

Caspian Sea National Day

- **Caspian National Day was held virtually on August 11, 2021 by the Environmental Protection Organization. The lectures are as follows:**
- **Dr. Lahijanzadeh** - Deputy Minister of Marine Environment
- **Dr. Tajbakhsh** - Head of the Meteorological Organization (Climate Change of the South Coast of the Caspian Sea
- **Mr. Rastad** - Head of the Ports and Maritime Organization
- **Dr. Pourkazemi** - Sturgeon and the need for practical action to save endangered species in the Caspian Sea
- **Dr. Bani Hashemi** - The trend of climate change and its impact on the water balance and environmental security of the Caspian Sea

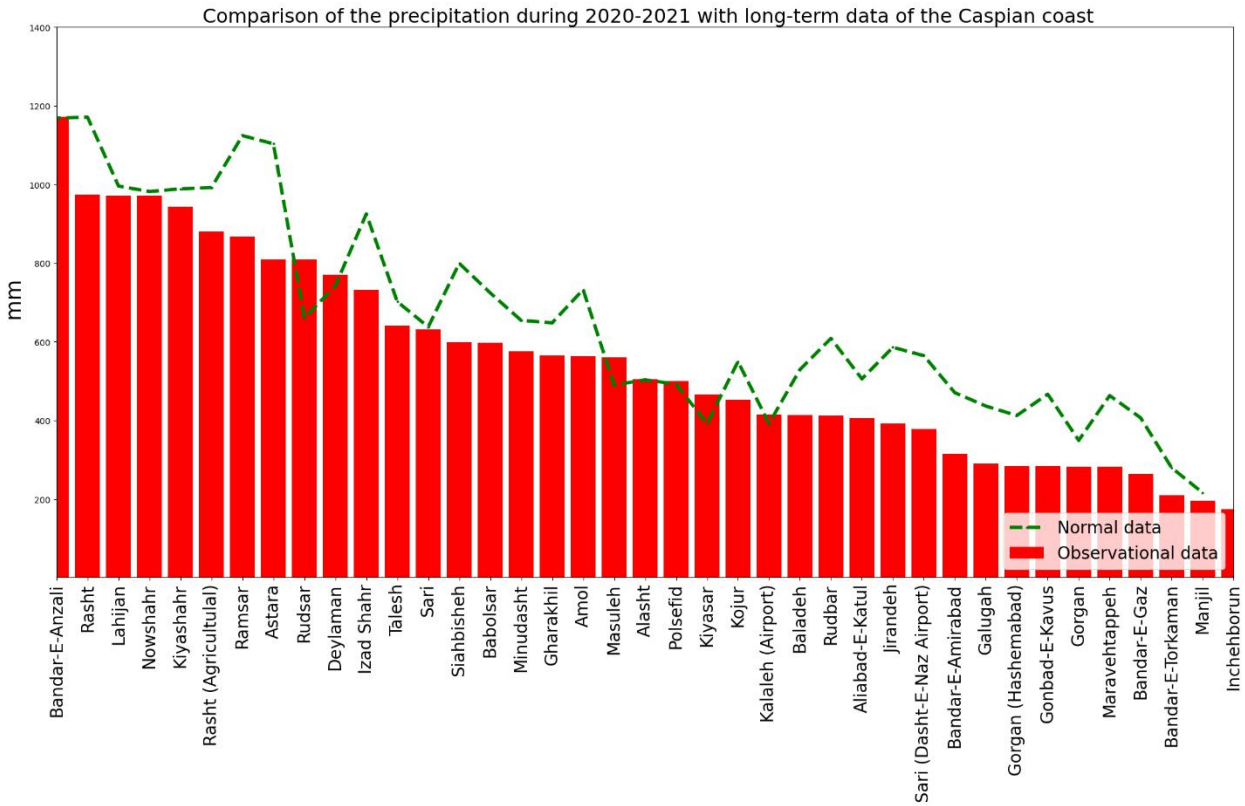
Caspian Sea National Day

Dr. Riahi Bakhtiari - The use of plastic pellet resin in the monitoring of biomarkers and biomarkers of hydrocarbons on the southern shores of the Caspian Sea

Dr. Alizadeh Lahijani - Simultaneous effect of increasing nutrient load and global warming on the Caspian Sea

Study and research

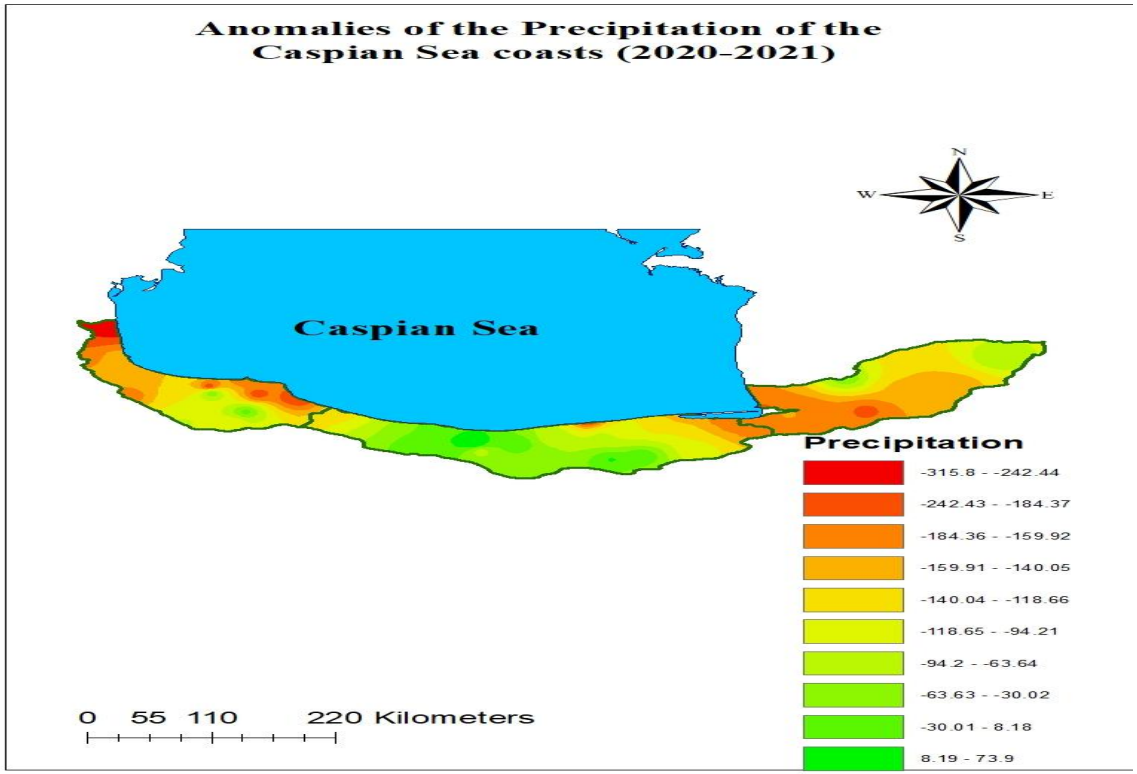
Climate report of Caspian South Coastal 2020-2021



Total precipitation for the Caspian Sea2020-2021

Study and research

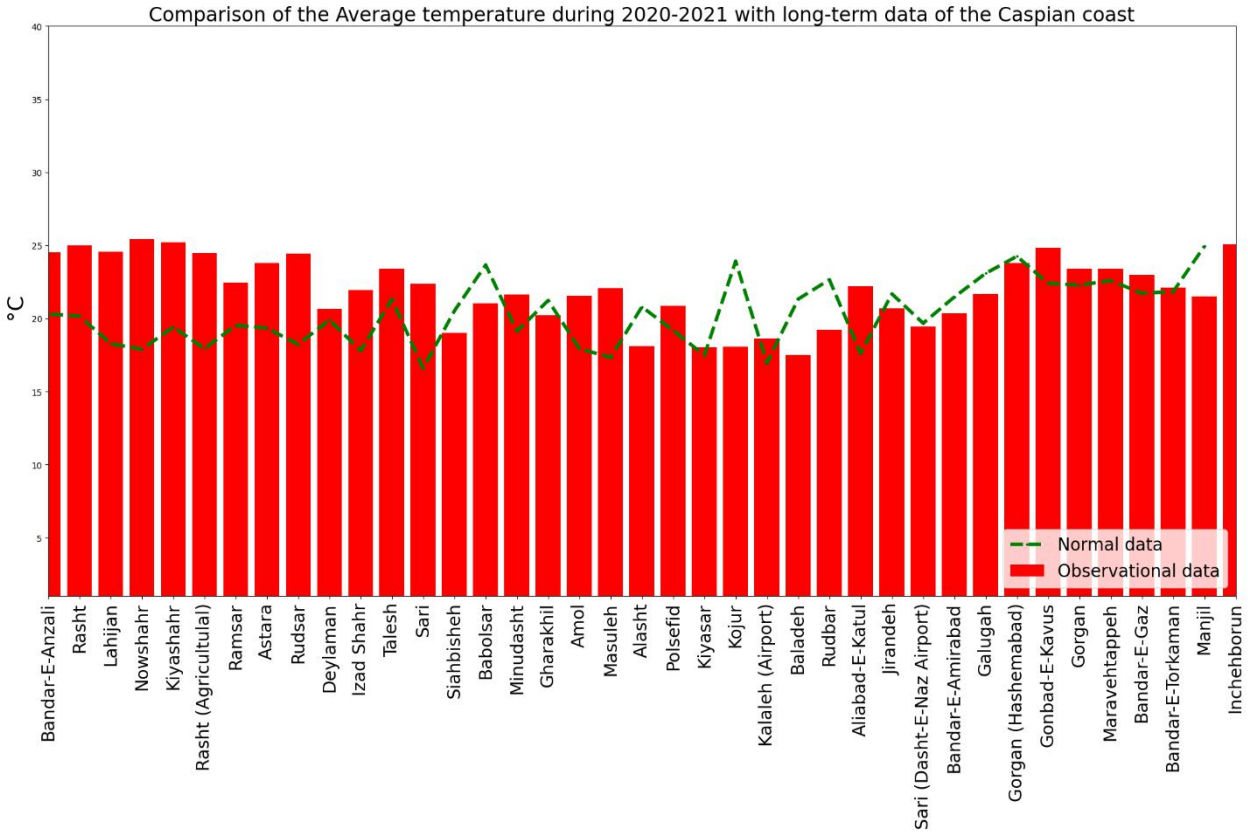
Climate report of Caspian South Coastal 2020-2021



Annual precipitation in Caspian Sea 2020-2021

Study and research

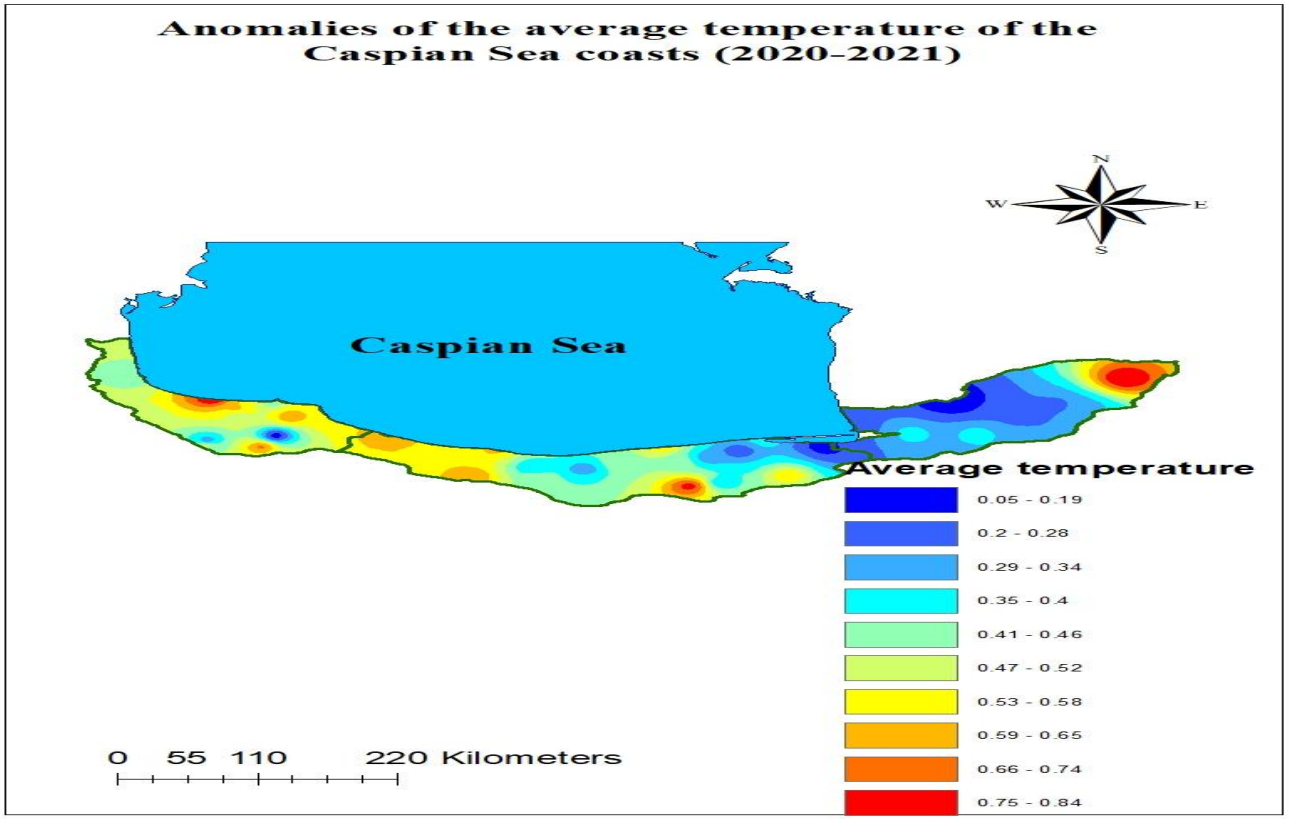
Climate report of Caspian South Coastal 2020-2021



Average Temperature for the Caspian Sea 2020-2021

Study and research

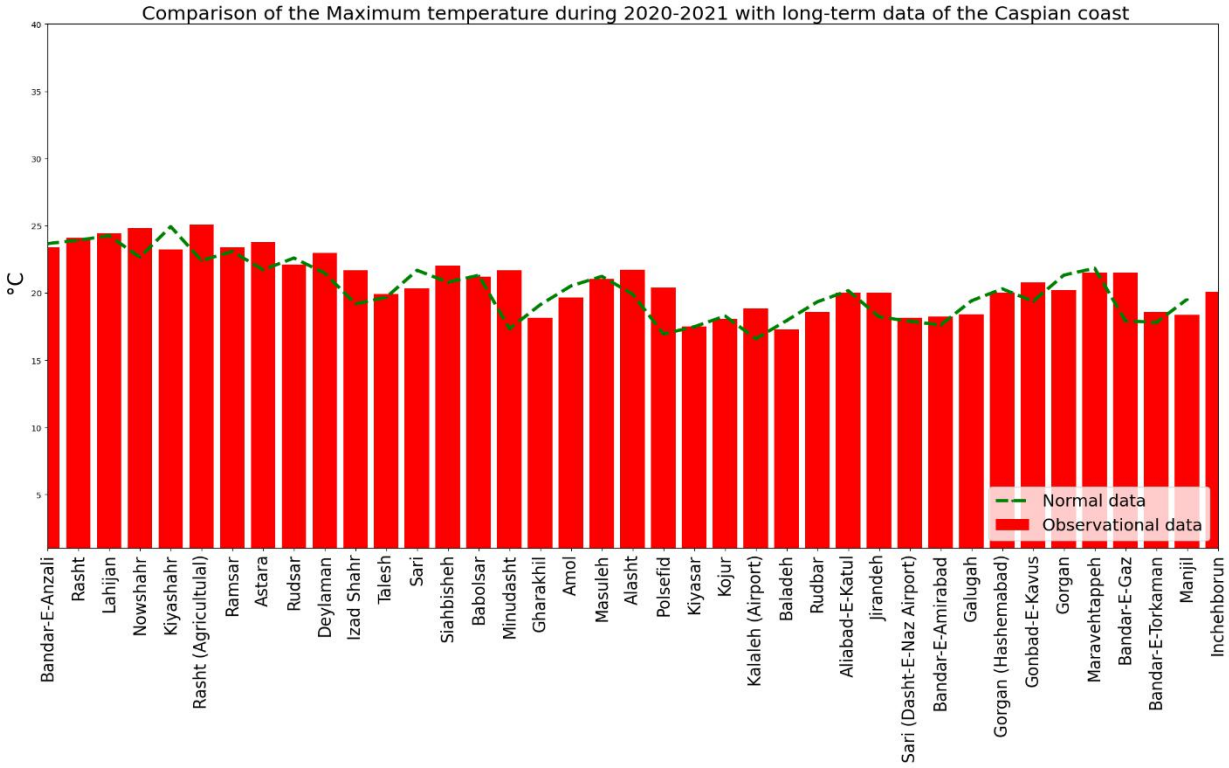
Climate report of Caspian South Coastal 2018-2019



Average temperature of the Caspian Sea Coastal 2020-2021

Study and research

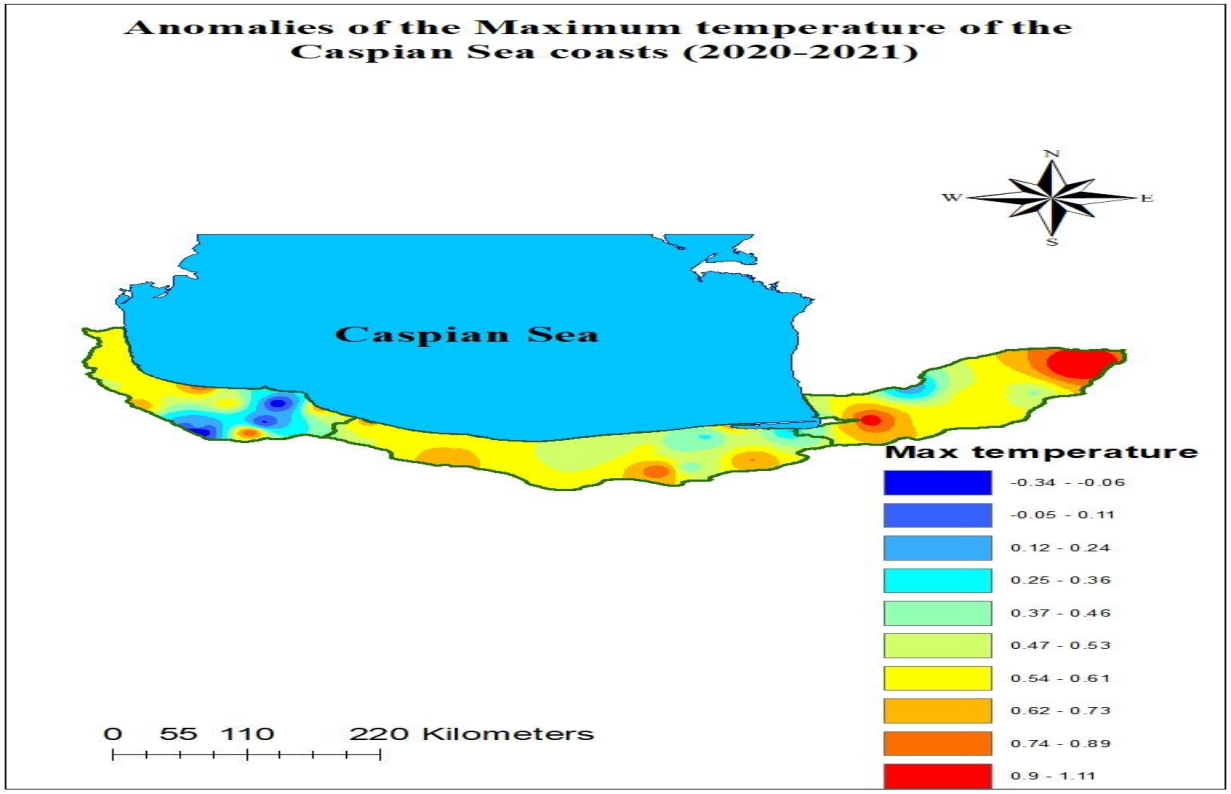
Climate report of Caspian South Coastal 2018-2019



Average Maximum Temperature for the Caspian Sea
2020-2021

Study and research

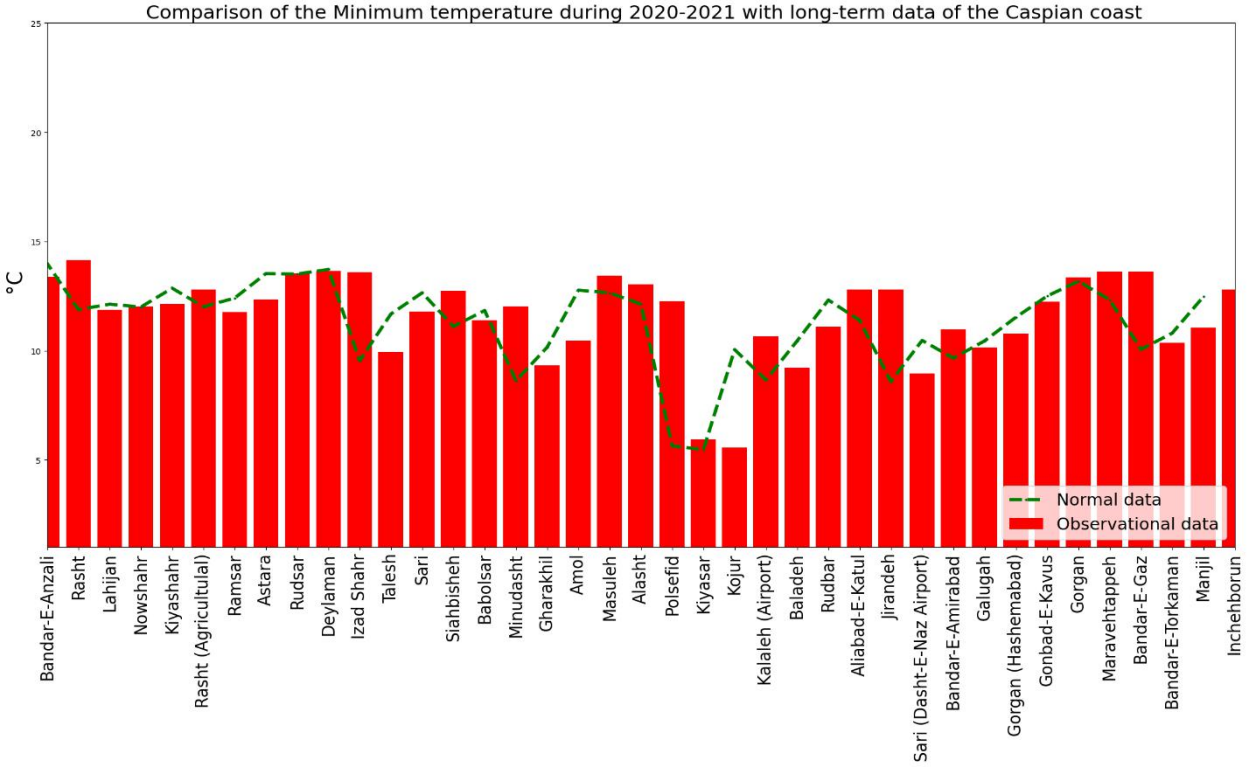
Climate report of Caspian South Coastal 2018-2019



Average Maximum Temperature for the Caspian Sea Coast 2020-2021

Study and research

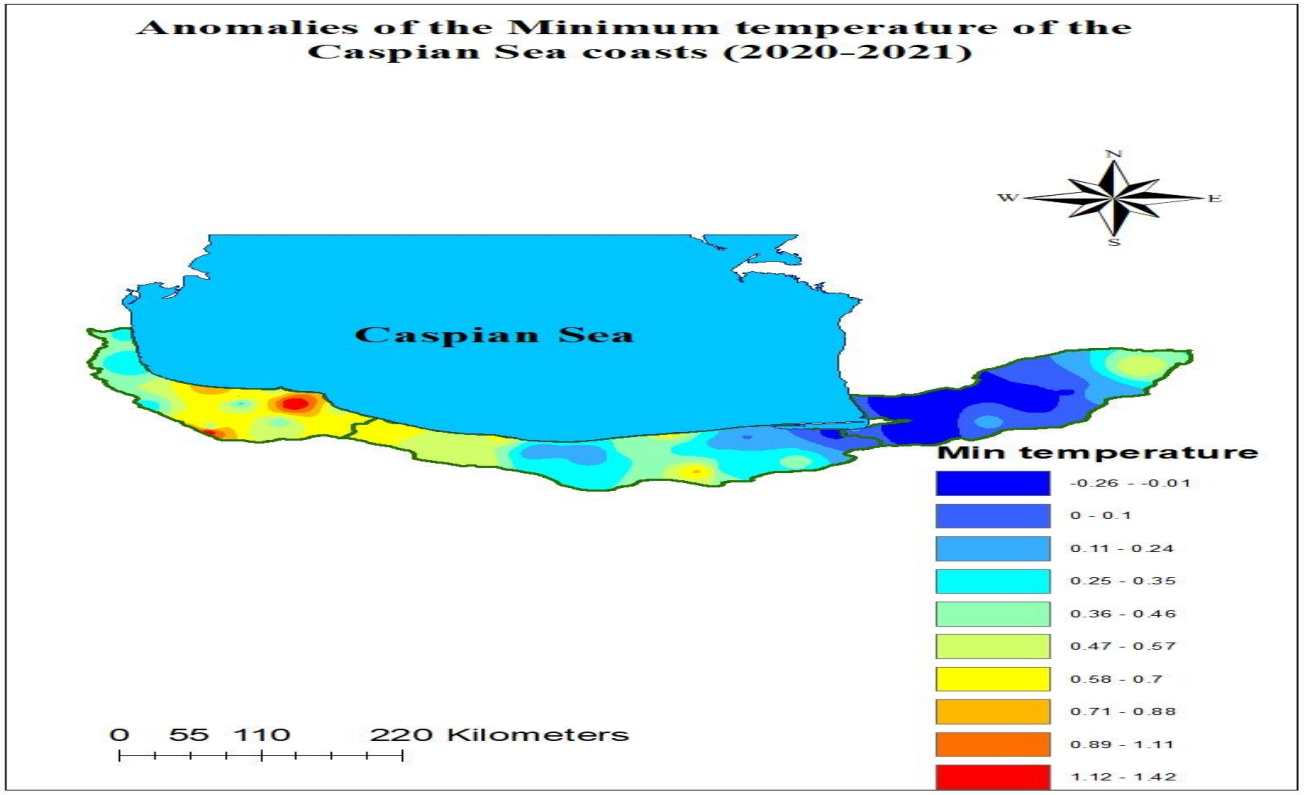
Climate report of Caspian South Coastal 2018-2019



Minimum average temperature for the Caspian Sea Southern Coasts 2020-2021

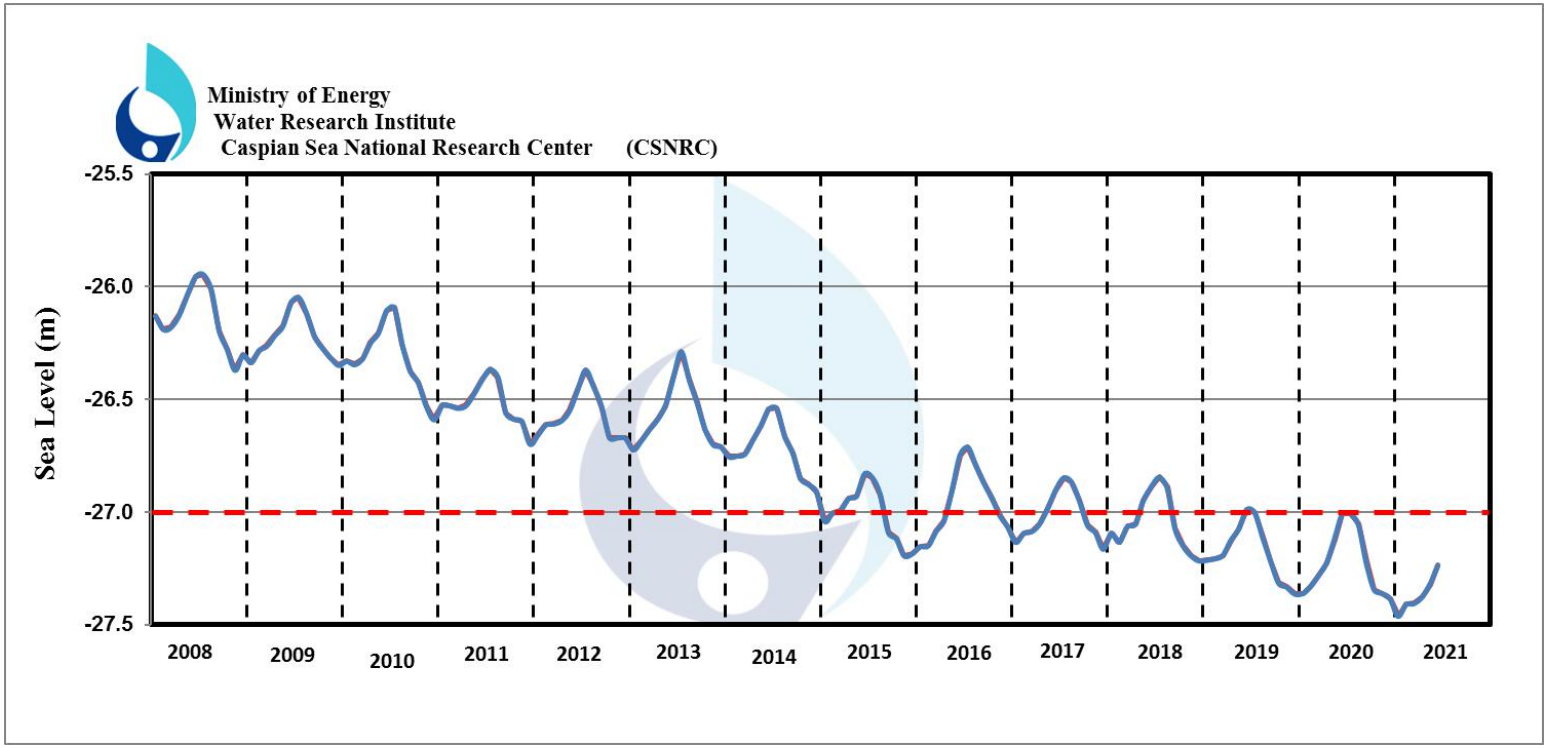
Study and research

Climate report of Caspian South Coastal 2018-2019



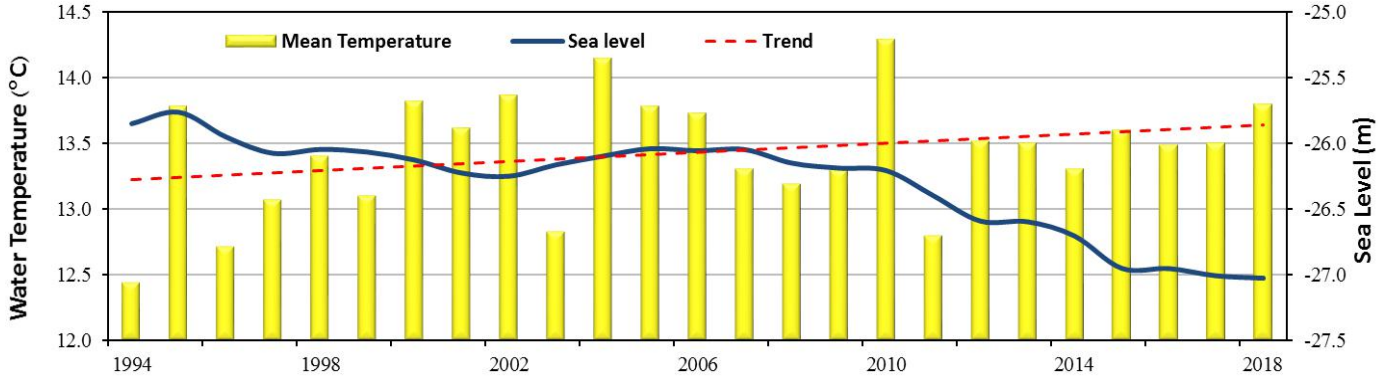
Minimum Average Temperature in Caspian Sea Southern Coasts 2020-2021

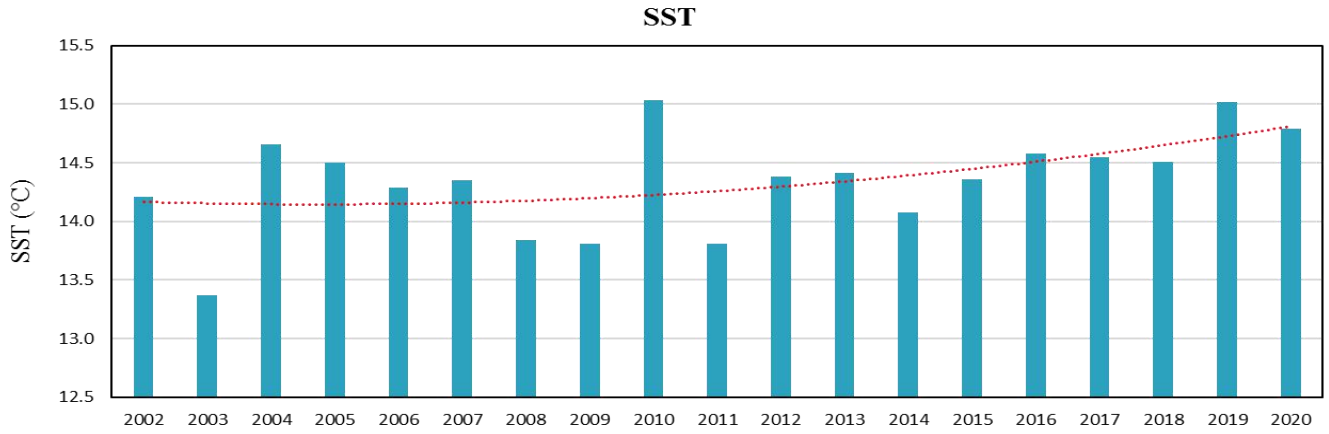
Caspian Sea Level (2008-2021)



Year	Sea level (m)	Sea level change rate Increase (+) Decrease (-) (cm/y)	Mean sea level change (per month)	Maximum sea level decrease & increase (month)
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	6	September
2016	-26.96	+5	7	May & June
2017	-27.02	-6	5	October
2018	-27.05	-3	6	September
2019	-27.18	-13	5	August
2020	-27.23	-5	6	September

Temperature changes in the Caspian Sea





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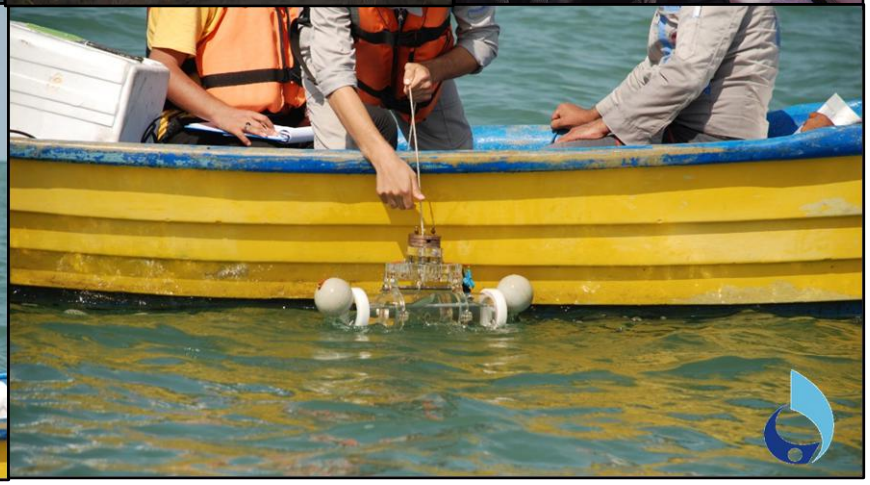

Marine prediction
Marine TAHAK
and
aims of its institution

In order to implement the Applied Meteorological Development Plan (Tahak) in the seaplane section, seven steps are considered below:

1. Identify the end users of the Marine Tahak (including the list of individuals and groups of applications)
2. Requirements for marine users, such as completing the need-assessment form (design by total chart) and resource-based identification
3. Production of marine data and product
4. Ways to communicate with end users
5. Capacity building
6. Survey based on the feedback form designed by the General Directorate
7. Documentation and Value Added

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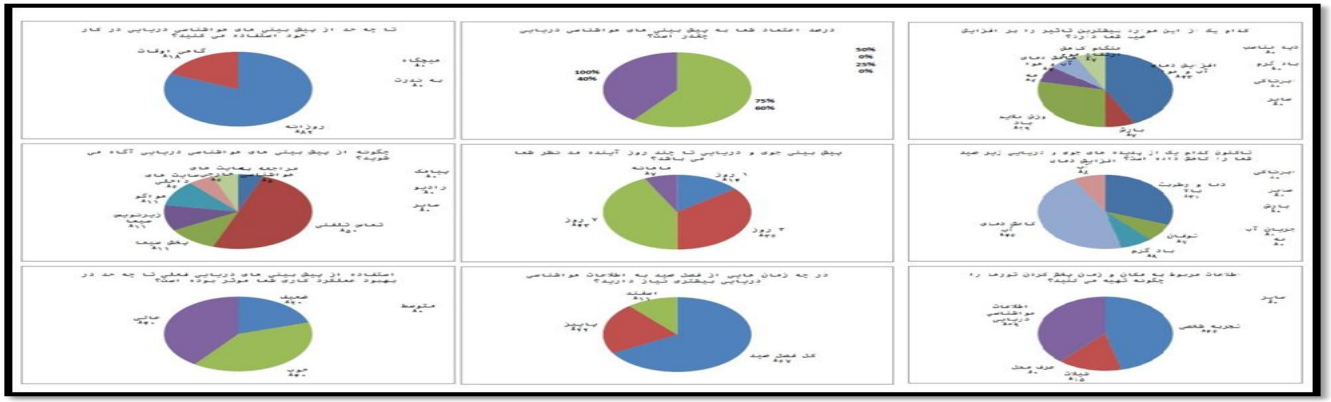
Marine prediction
Marine TAHAK
and
aims of its institution

Sample of proceeding form of marine "TAHAK" for capacity building and needs assessment

In session held at 97/09/07 at RADAR station of Amirabad port



Marine prediction
Marine TAHAK and aims of its institution

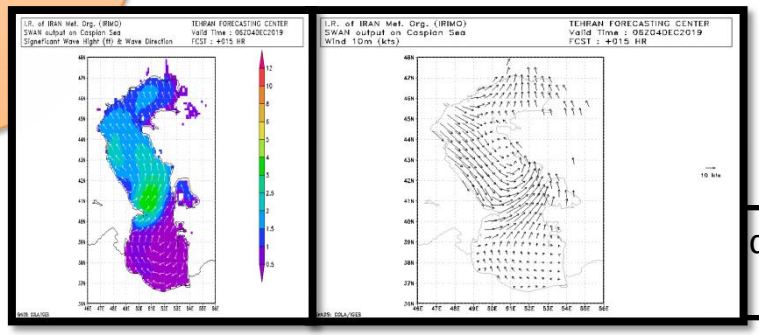
Marine metrological advises for :
groups of fishers, tourists, and port and navigation
are producing which mostly contains:
wind direction and speed, forecast of weather and wave height
according to users needs.
Daily issue of SMS containing
two day forecast of weather and wind direction and speed and wave height
being done.
In this direction, a forecasting format is planned in which all coasts of the country has been divided into seven part for seven coastal provinces

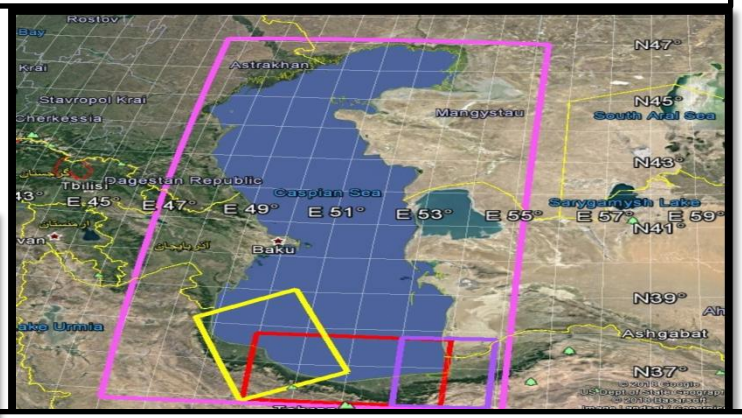
locations of southern Caspian Sea provinces ports

Swan model output for considerable wave in CASPIAN SEA

wind waves are most observed waves at sea, and have most effect on human actions at sea area. Coastal cities like Amirabad port and Kiashahr because of fishery, navigation, coastal managing, port management, and marine trading, increasingly need wave forecast. Swan wave model used for calculation of irregular waves at coastal regions based on deep water waves, win, bed topography, currents and tides (deep and shallow water). Nested idea in SWAN wave model is calculation of waves on a coarse net on a bigger area, then calculation on finer mesh on limited area.

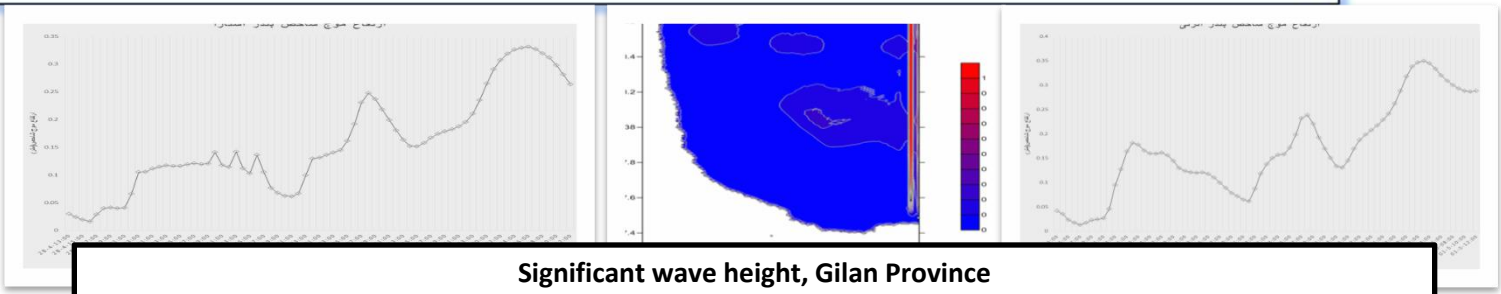
SWAN maps on Caspian Sea





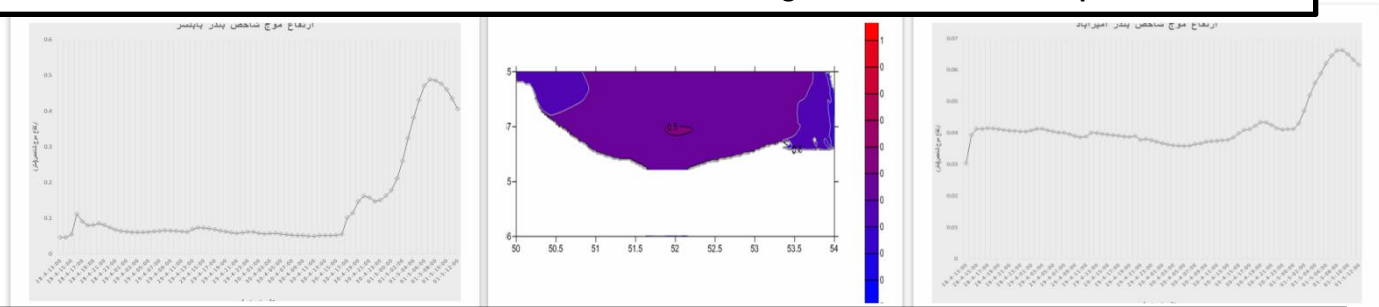
domain of Caspian Sea model and southern coastal provinces

Swan model output for considerable wave in CASPIAN SEA



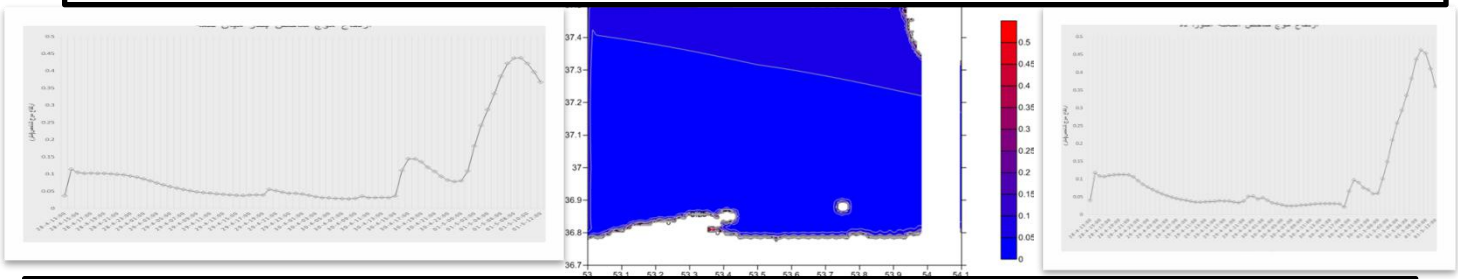
Significant wave height, Gilan Province

time series of 72hr forecast for considerable wave height of Anzali and Astara ports



Significant wave height, Mazandaran Province

time series of 72hr forecast for considerable wave height of babolsar and Amirabad ports



Significant wave height, Golestan Province

time series of 72hr forecast for considerable wave height of Mian Ghale and Ashuradeh

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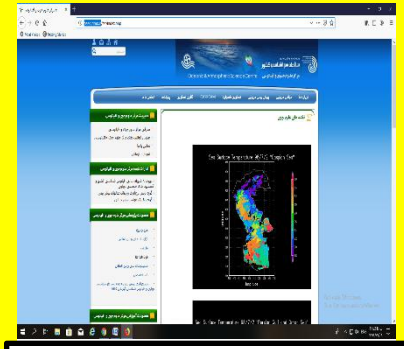
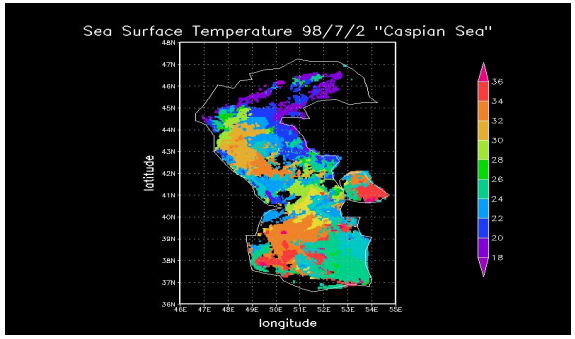
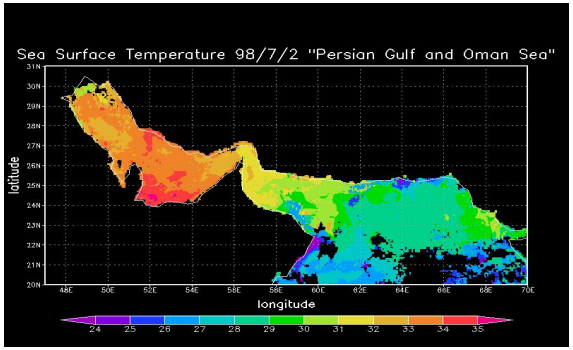
Web site

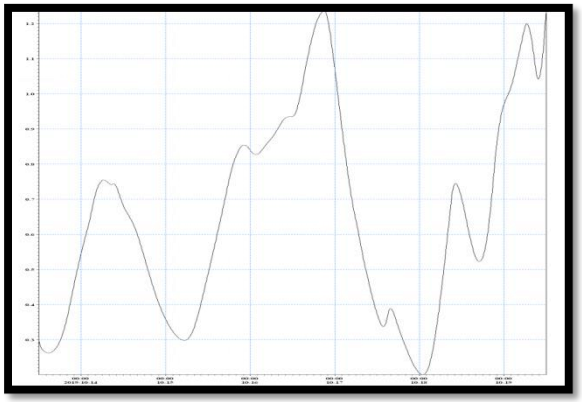


http://oasc.irimo.ir

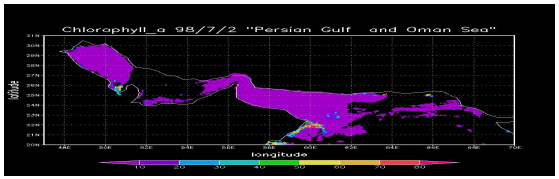
Caspian sea ,persian golf and oman sea
Sea surface temperature

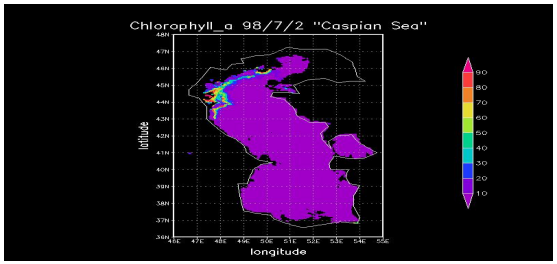






Mike 21 point forecast, significan wave height





Caspian sea ,persian golf and oman sea Chloraphyll-a

Action Plan

1. Development and promotion of required stations for fixed observation networks 2020-2022 — 10 national Fixed Stations
2. Development of marine buoys network 2020-2022 — 5 Buoy
3. Development and promotion of required stations for mobile network monitoring 2020-2022 — 4national observation ships

Action Plan

4	Development and enhancement Marine Meteorological Forecast for the Caspian Sea (Bulletin and Map) 2020-2022	1 nationale nhanced marine forecast system
5	Development and enhancement the common data bank Marine Meteorological 2020-2022	1 national data bank
6	Development and enhancement of the platform for the exchange of mar meteorological information between the Caspian littoral states 200-2022	1 national enhanced data exchange system

7

Researches
2020-2023

6
Researches

Action Plan

1. Development and set up a system for long-term and medium-term measurements to modernize observation networks to determine the hydrological characteristic
2. Meteorological measurements in the Caspian region, by comparing the methods used to measure atmospheric rainfall and evapotranspiration of sea surface
3. Follow up the long-term observing ship in the standard and official sections of the Caspian Sea
4. Completion of aerology observation networks in the Caspian Sea
5. Formation of an automated system for collecting, processing and distributing information in order to calculate and predict the Caspian Sea's environment and its pollution, including natural phenomena forecast and dangerous in hydro meteorology and the harmful effects of technological processes and phenomena (Storms, unexpected floods, oil spills, etc)
6. Identify regional needs for training education, and the transfer of information and experiences

Action Plan

8

training courses
2020-2023

7 courses

1. courses on coordinated regional observation in the Caspian Sea
2. Courses on Atmosphere-Ocean Coupled Modeling
3. courses designed to collect, process and store region information
4. Satellite meteorology courses
5. Introduction to Marine Meteorological Data and Data Quality Control Software courses
6. atmosphere and Ocean Numerical Modeling Training courses
7. courses on telecommunication and satellite platforms


Thankyou