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

## Astrakhan, Russia, 25 October 2021

# I.R.IRAN NATIONAL REPORT for 25th Session of Coordination Committee of CASPCOM
Astrakhan, Russia 25 October 2021

مرکز علوم جوی و اقیانوسی
Oceanic & Atmospheric Science Centre

سازمان هواشناسی کشور
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.

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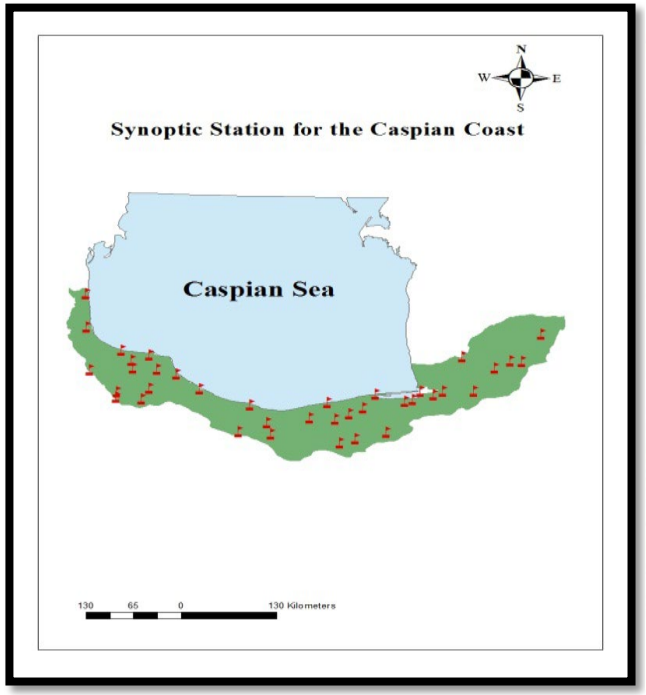
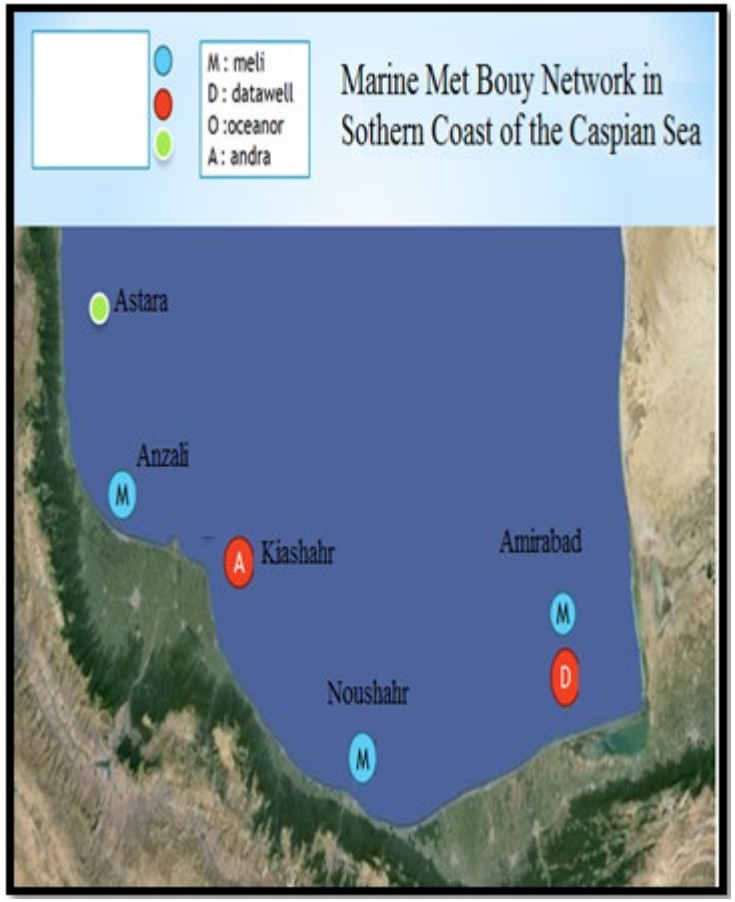
## 2.Development of measurement network in southern coasts of Caspian Sea

## 2-1- Coastal Marine Meteorological Network

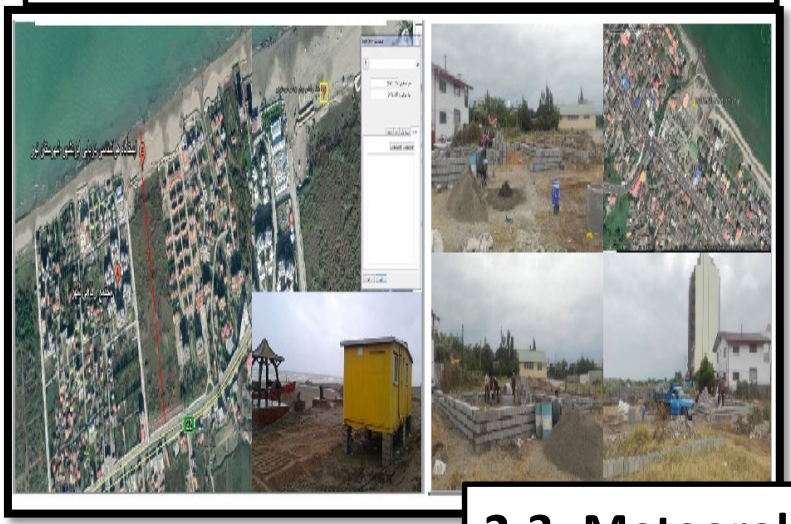



## 2-2-Marine Meteorological Buoys



**Development of measurement network in southern coasts of Caspian Sea**

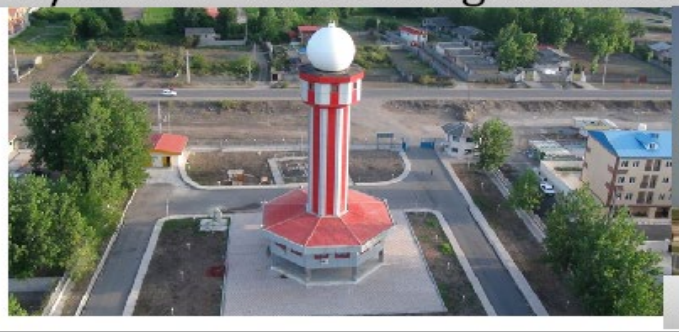
Development of marine meteorology observation, Noor and Tonkabon, Mazandaran Province



Research cruise near Gilan Province

## 2-3- Meteorological Radar

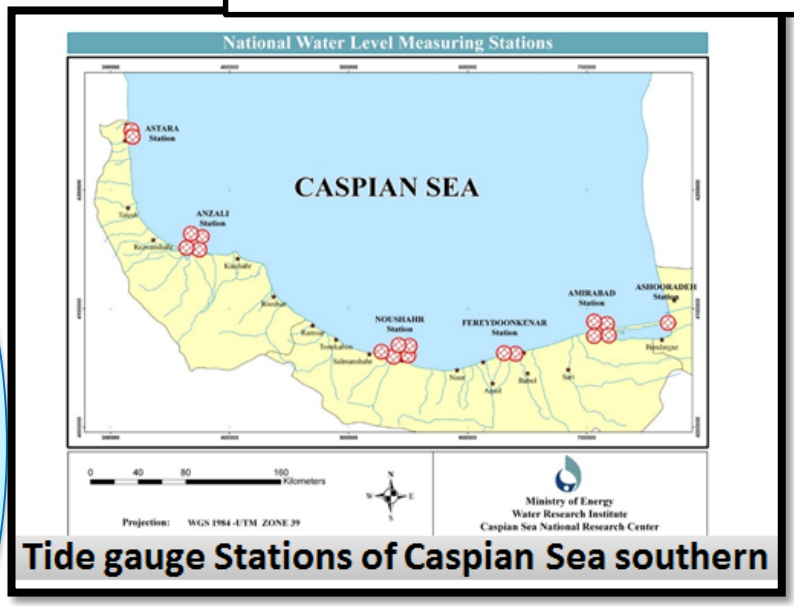
Kiyashahr Meteorological Radar



Amir Abad Meteorological Radar

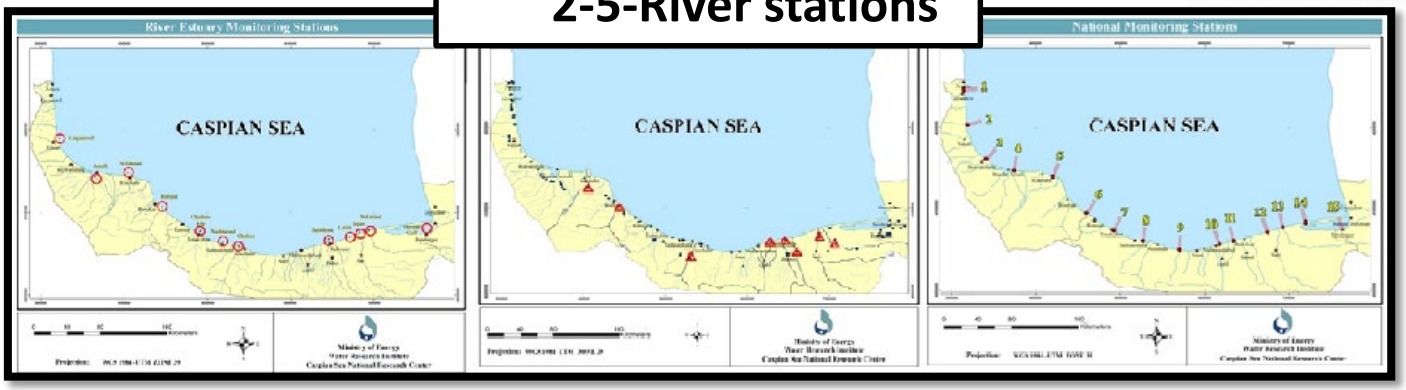
## 2-4- Caspian Sea Level monitoring network

**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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Astrakhan, Russia 25 October 2021

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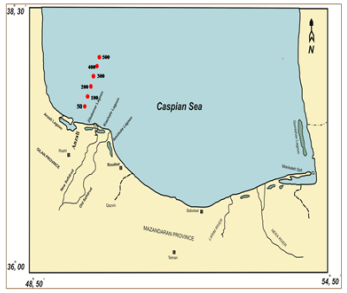
سازمان هواشناسی کشور
I. R. OF IRAN METEOROLOGICAL ORGANIZATION

## Study and research

### Deep water studies in the southern Caspian Sea

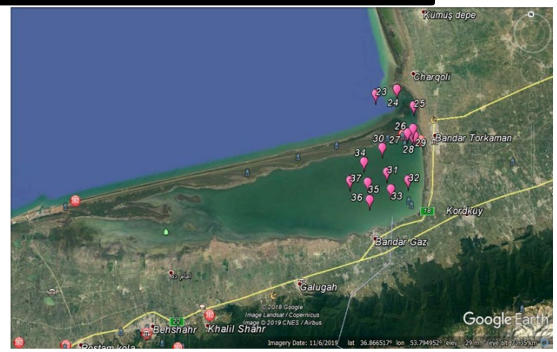
**Biological studies**
Phytoplankton
Zooplankton
Benthos
**Chemical studies**
Nutrients
Alkalinity
TOC
DO, pH and Chl-a
**Geological studies**
Sedimentology
**Physical studies**
Physical Parameters




**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**

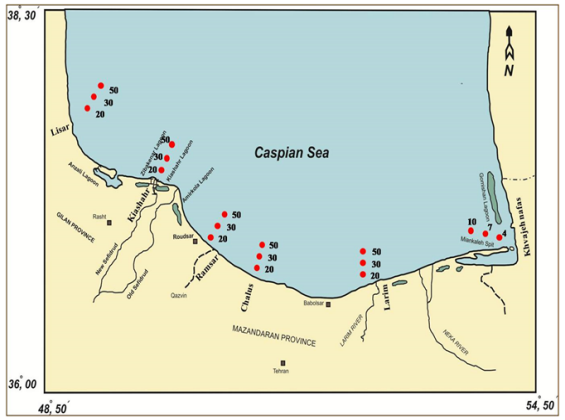
### Monitoring of environmental parameters in Anzali Wetland

**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

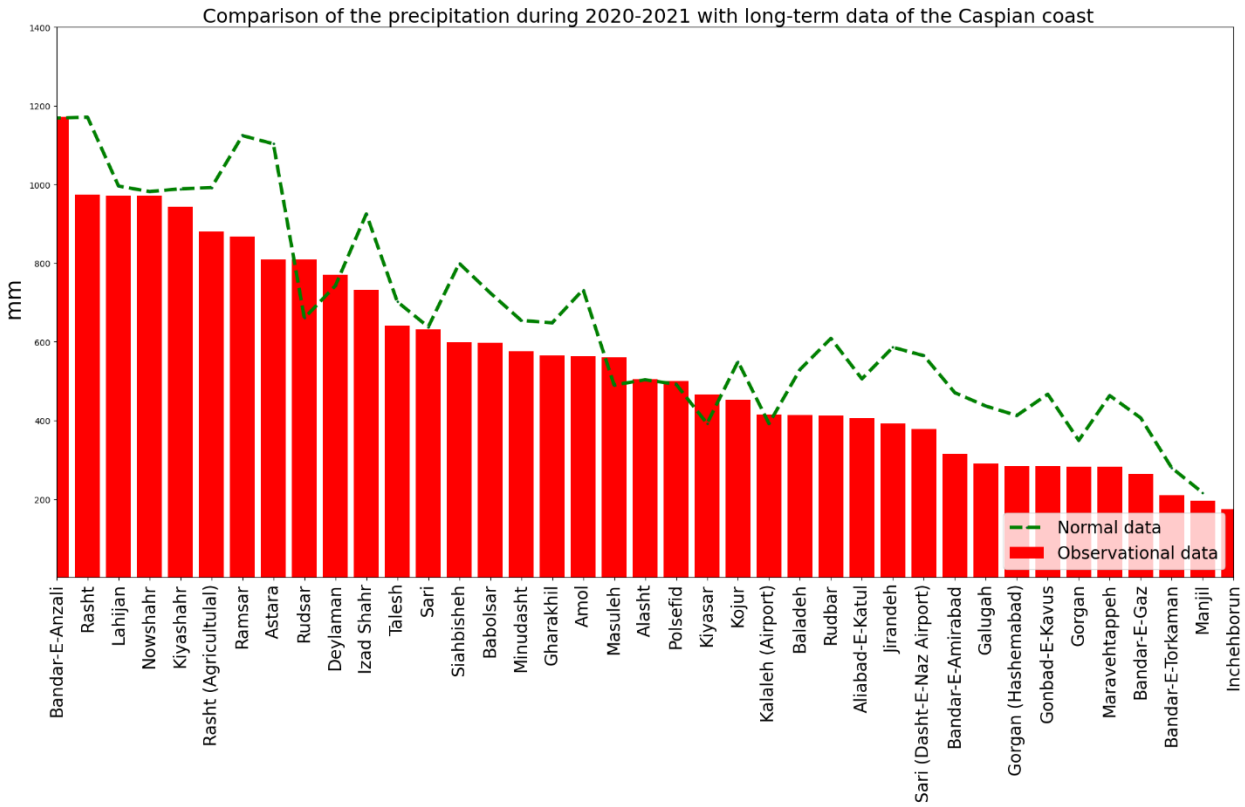
Caspian Sea National Day

**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

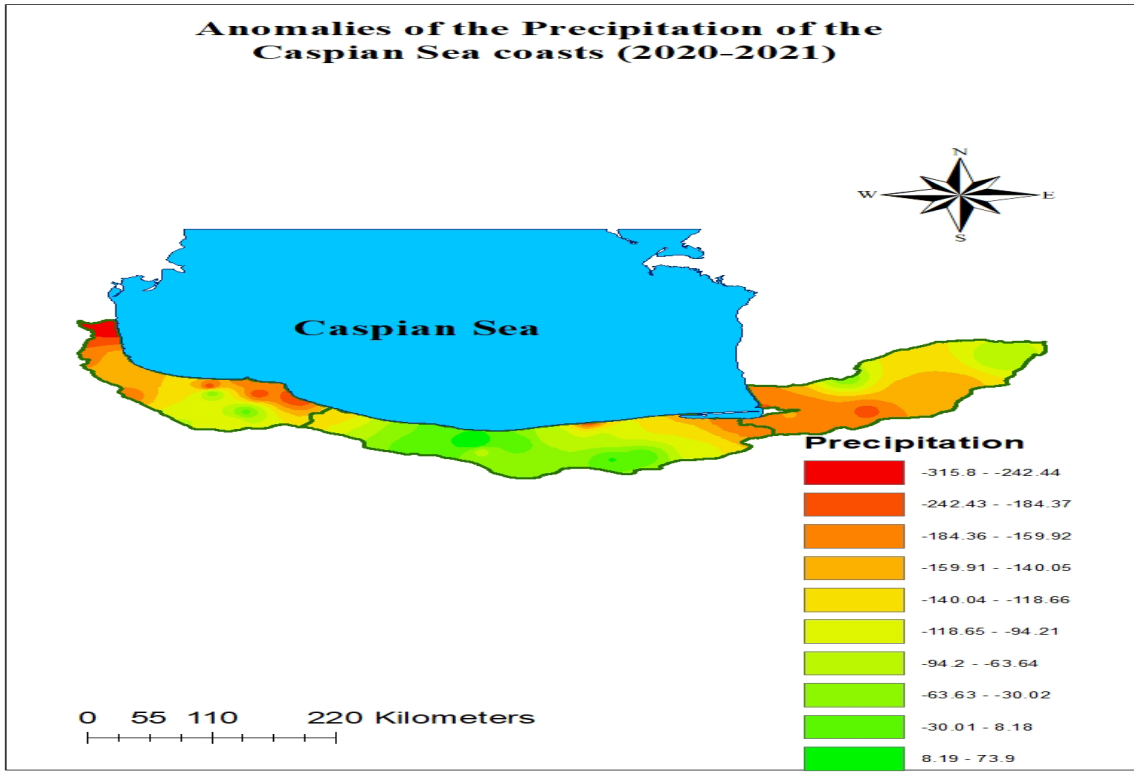
Climate report of Caspian South Coastal 2020-2021




Total precipitation for the Caspian Sea2020-2021

**Study and research**

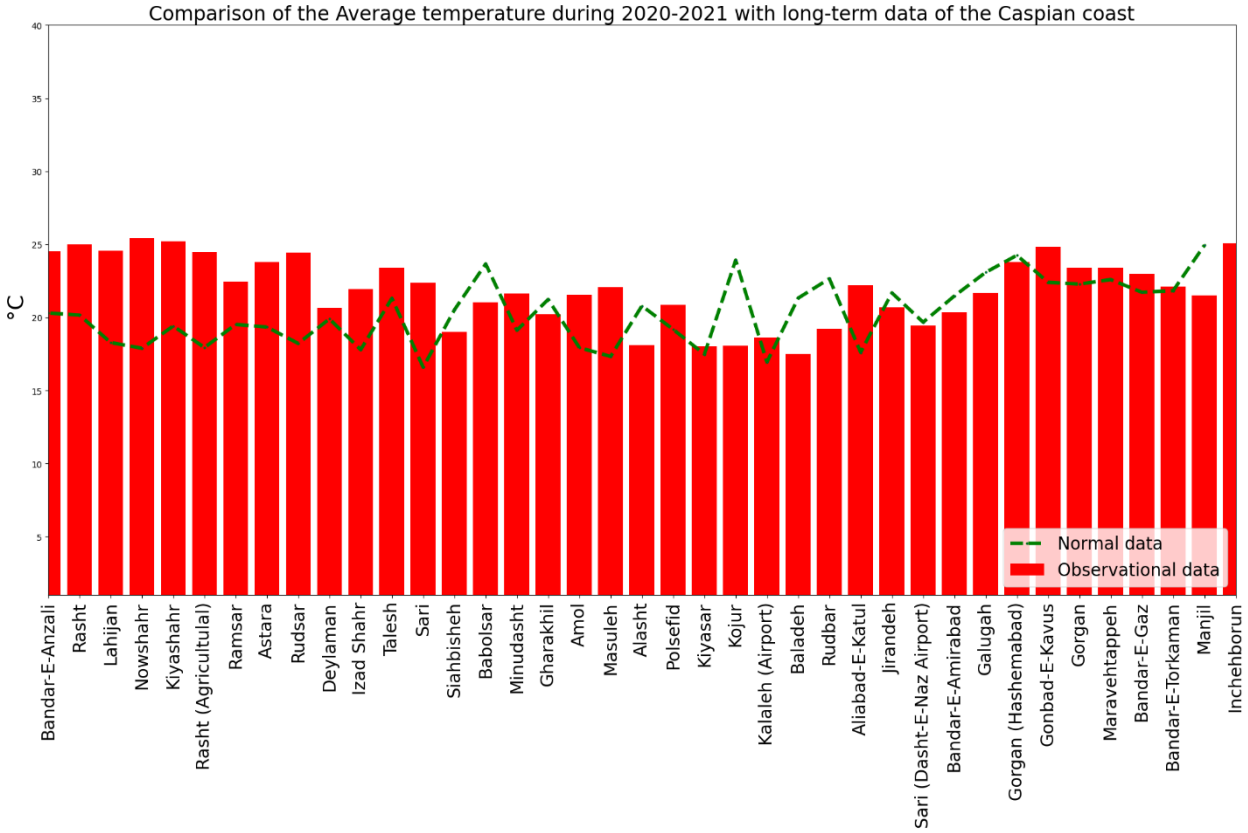
Climate report of Caspian South Coastal 2020-2021




Annual precipitation in Caspian Sea 2020-2021

**Study and research**

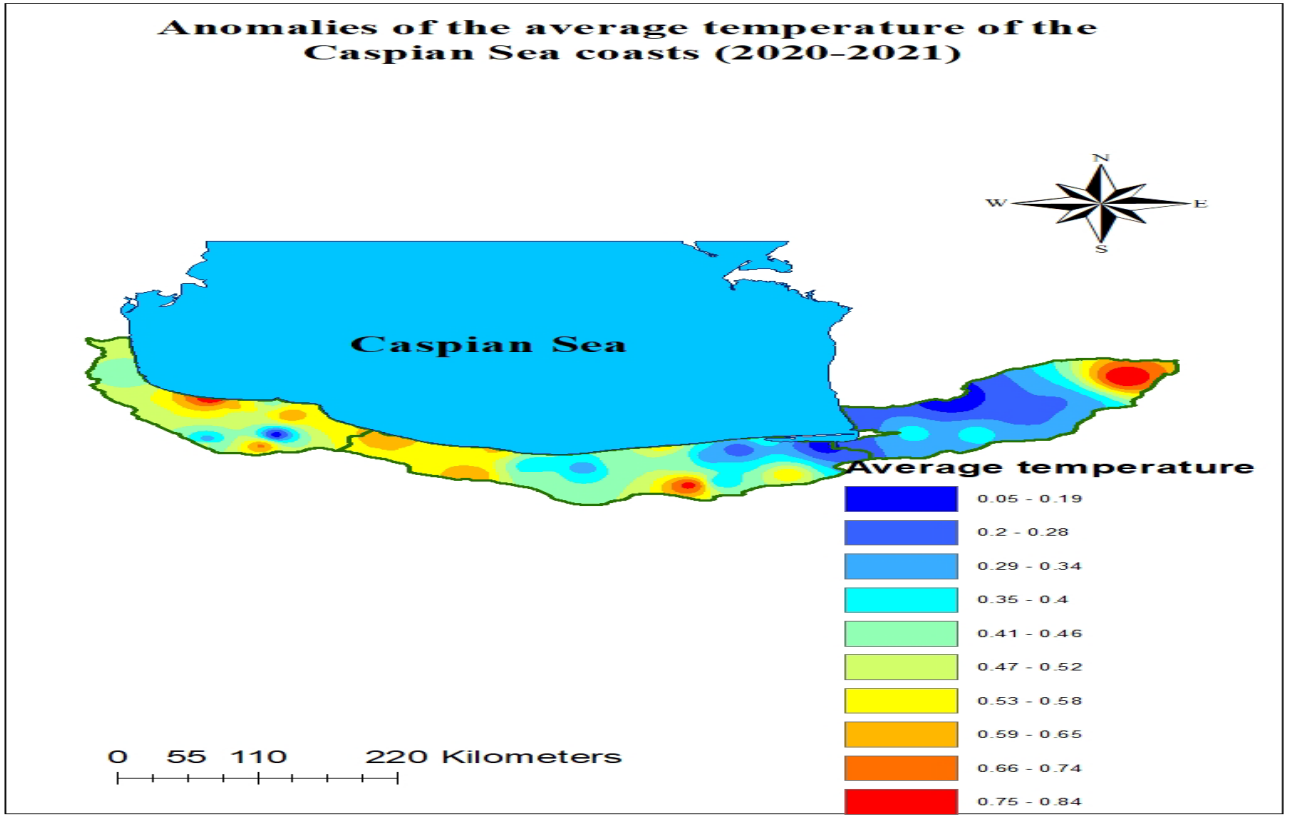
Climate report of Caspian South Coastal 2020-2021




Average Temperature for the Caspian Sea 2020-2021

## Study and research

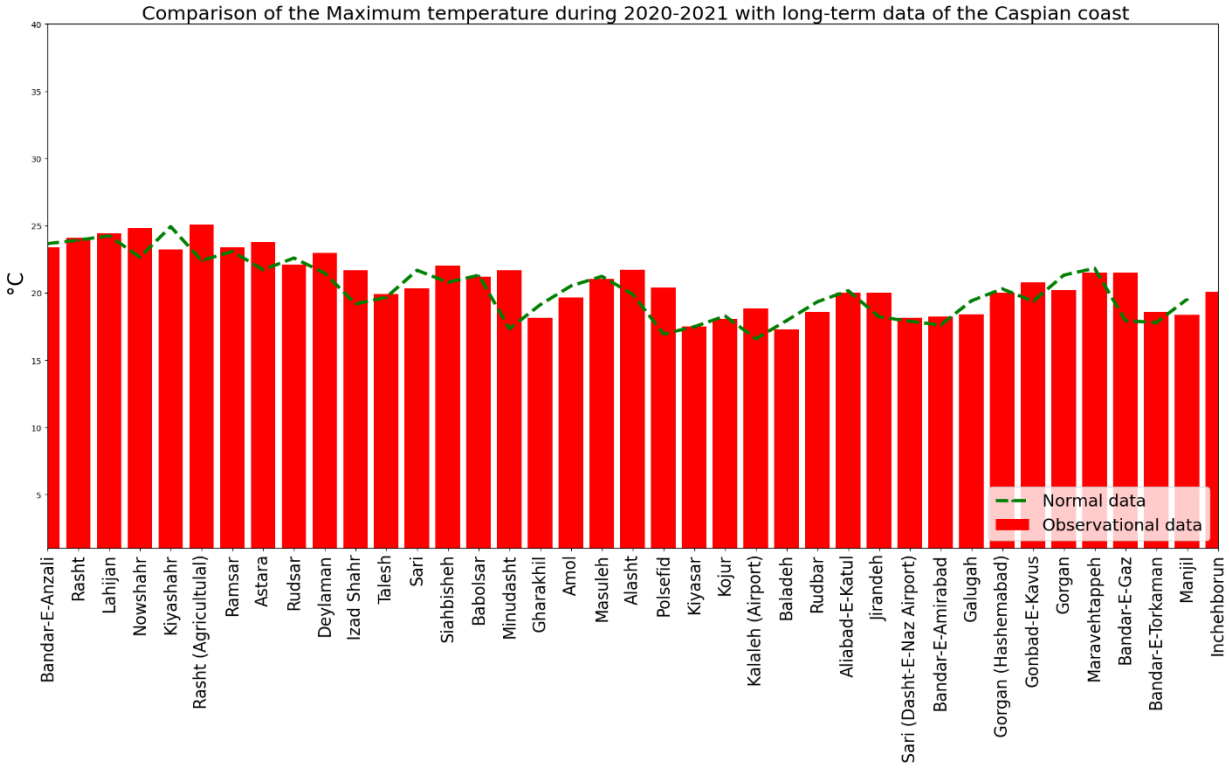
Climate report of Caspian South Coastal 2018-2019




Average temperature of the Caspian Sea Coastal 2020-2021

**Study and research**

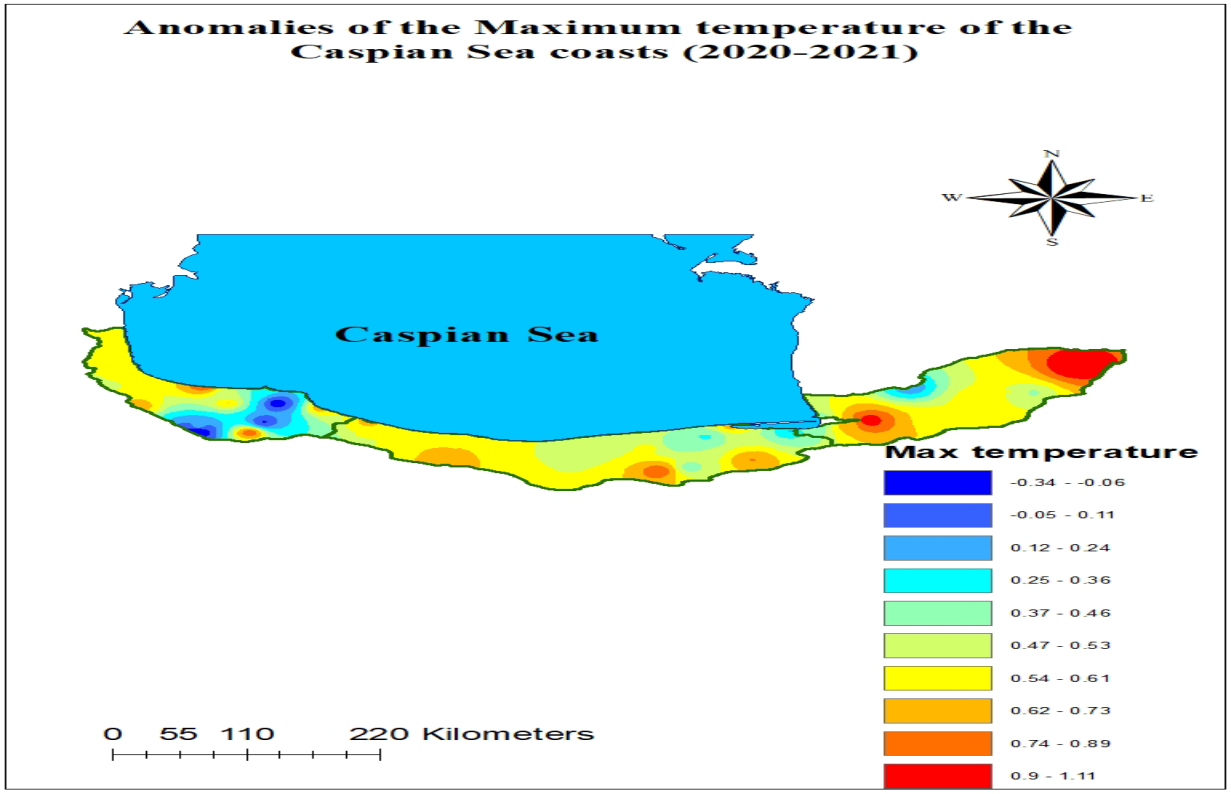
Climate report of Caspian South Coastal 2018-2019




Average Maximum Temperature for the Caspian Sea
2020-2021

**Study and research**

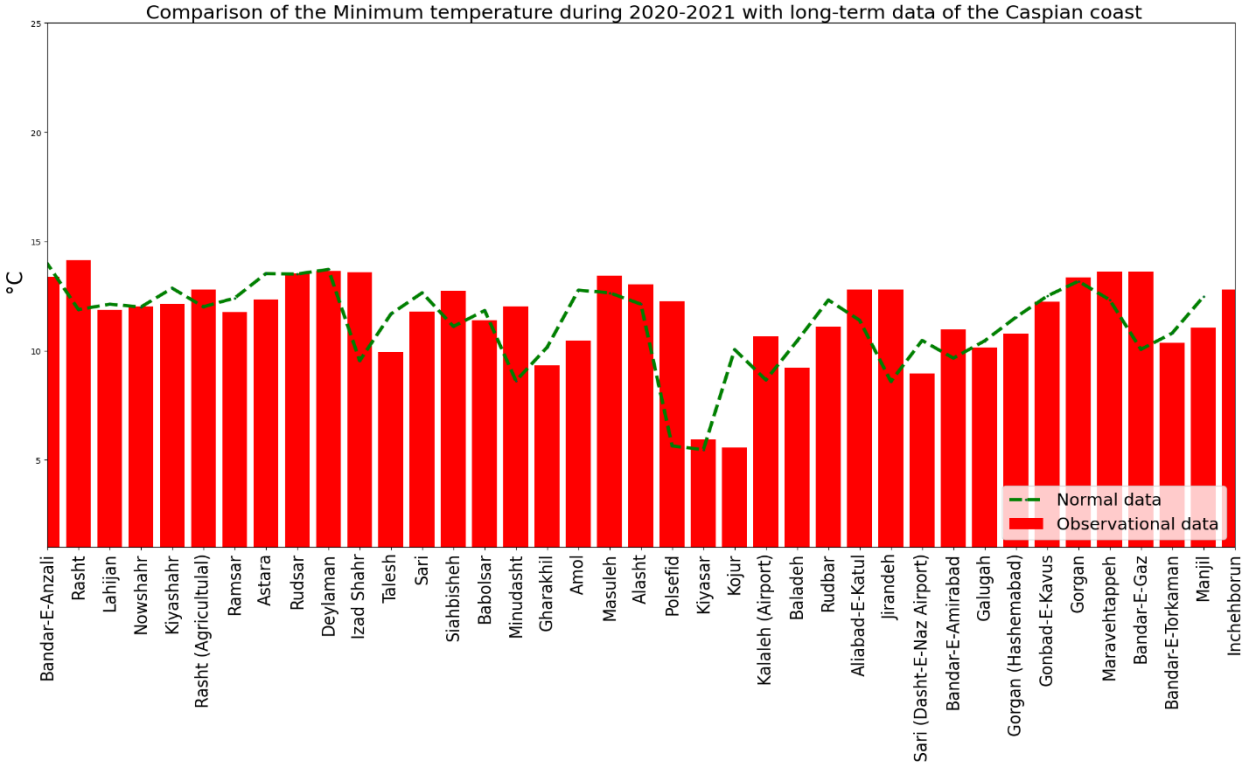
Climate report of Caspian South Coastal 2018-2019




Average Maximum Temperature for the Caspian Sea Coast 2020-2021

## Study and research

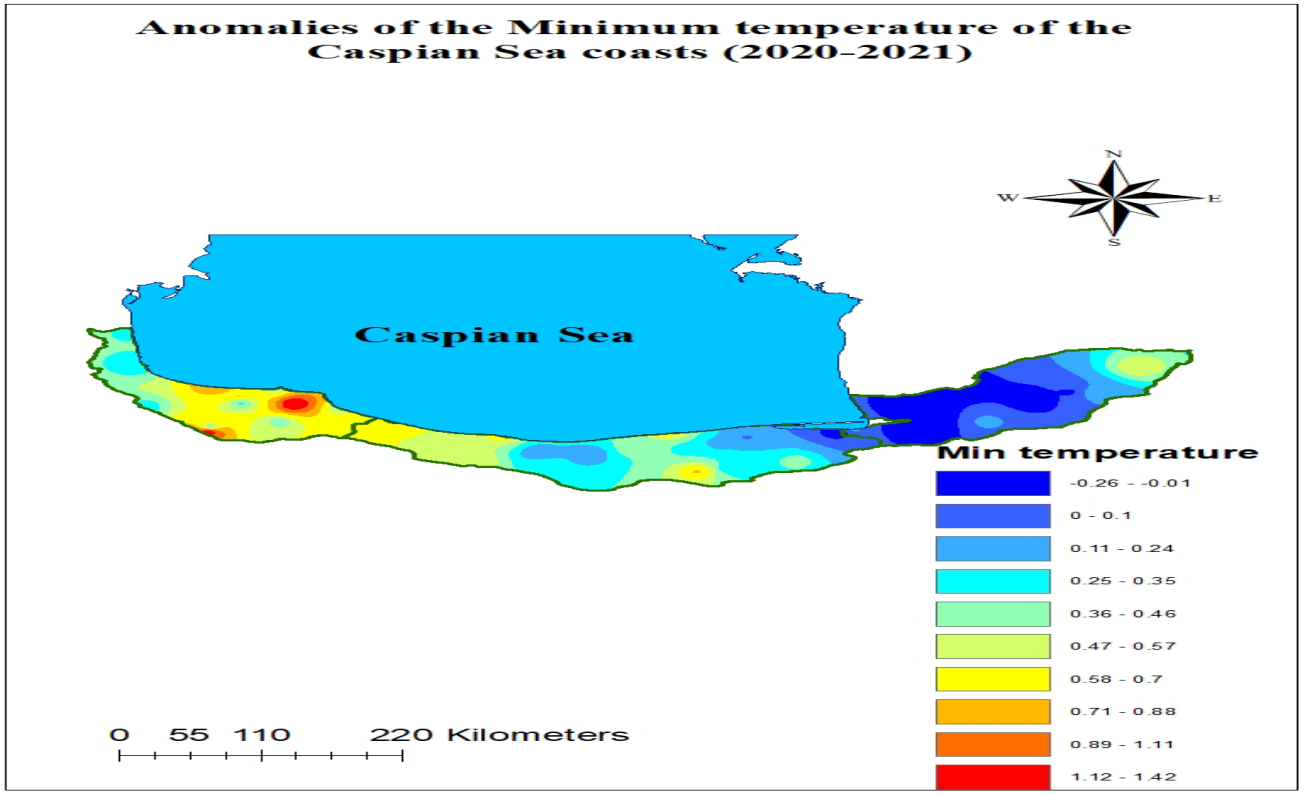
Climate report of Caspian South Coastal 2018-2019




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

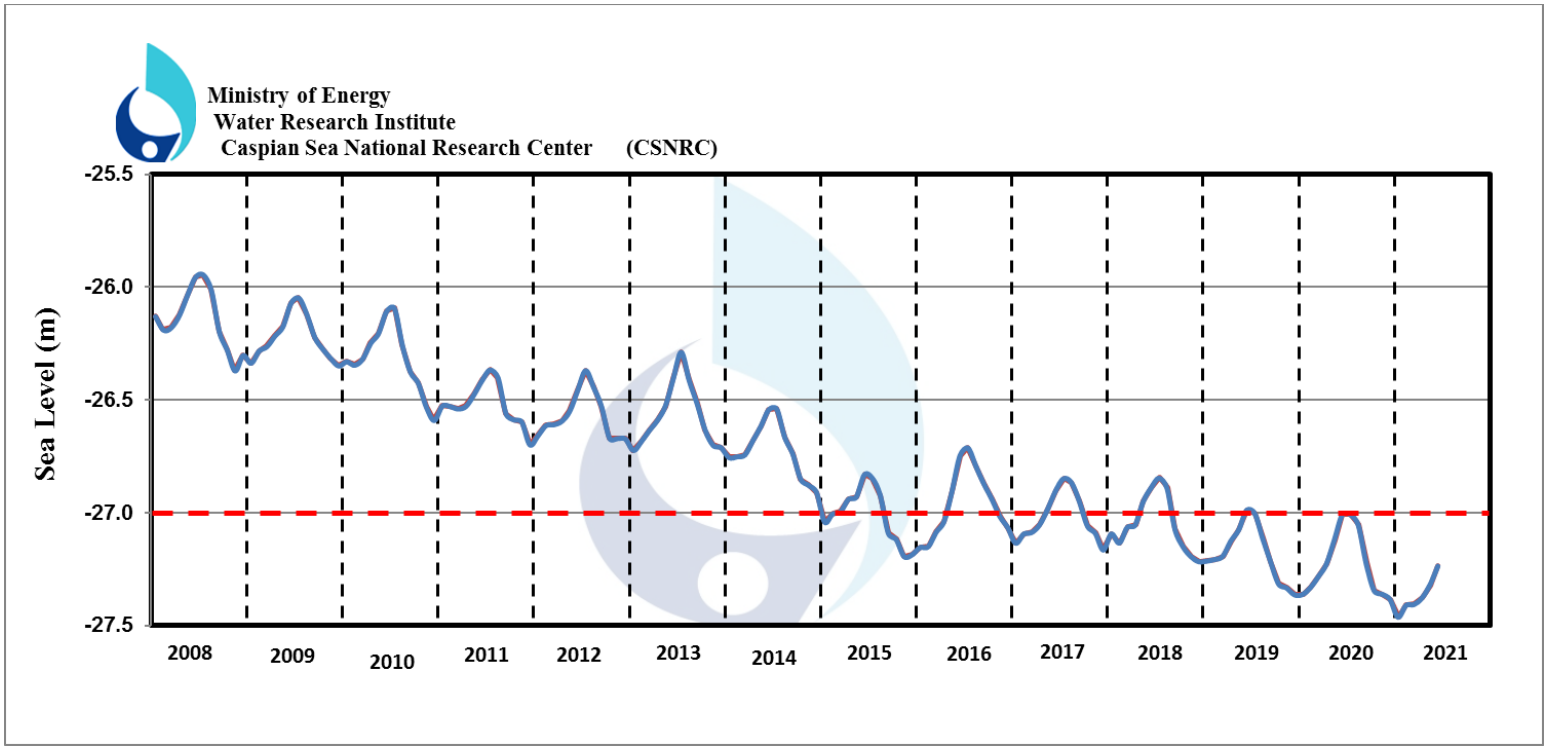
## Study and research

Climate report of Caspian South Coastal 2018-2019



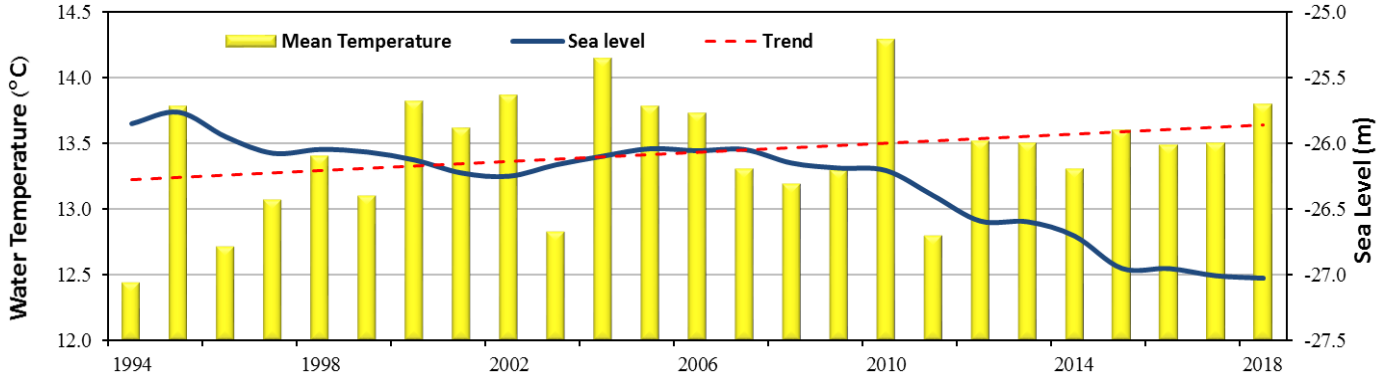

Minimum Average Temperature in Caspian Sea Southern Coasts 2020-2021

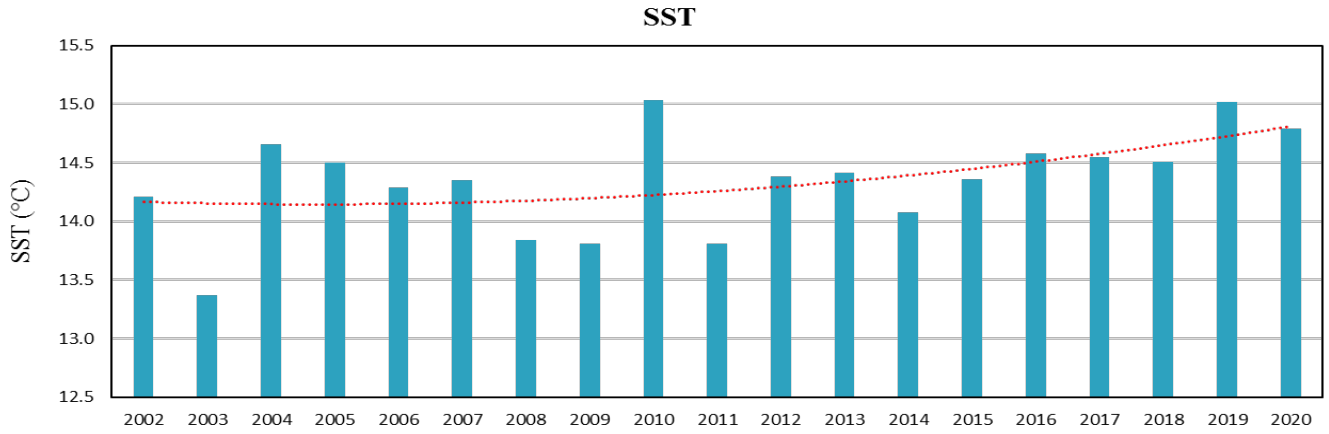
# Caspian Sea Level (2008-2021)



| 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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# I.R.IRAN NATIONAL REPORT for 24th session of Coordination committee of CASPCOM Tehran, Iran, 10-11December 2019

سازمان هواشناسی کشور
I. R. OF IRAN METEOROLOGICAL ORGANIZATION





**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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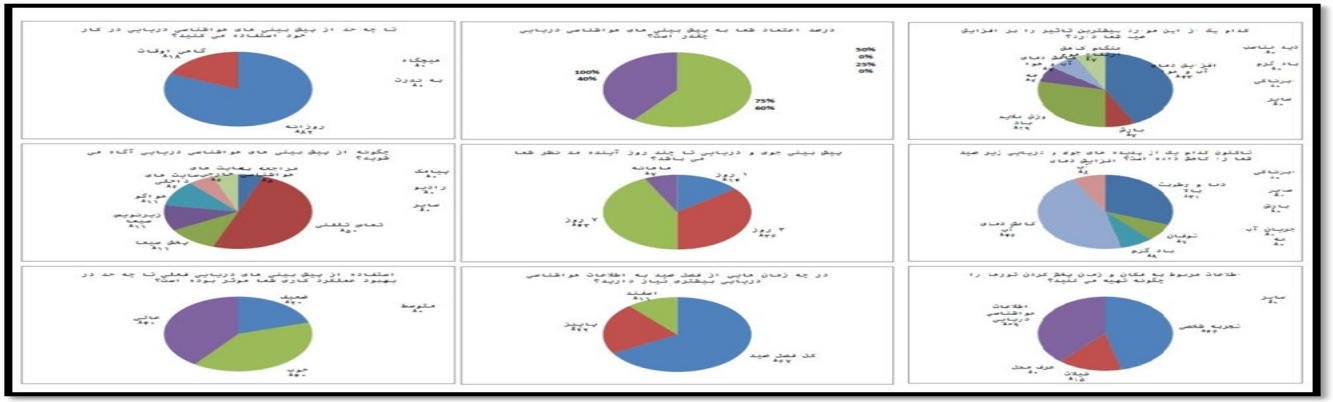
# I.R.IRAN NATIONAL REPORT for 25th Session of Coordination Committee of CASPCOM
Astrakhan, Russia 25 October 2021

سازمان هواشناسی کشور
I. R. OF IRAN METEOROLOGICAL ORGANIZATION

**Marine prediction**
Marine TAHAK
and
aims of its institution

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

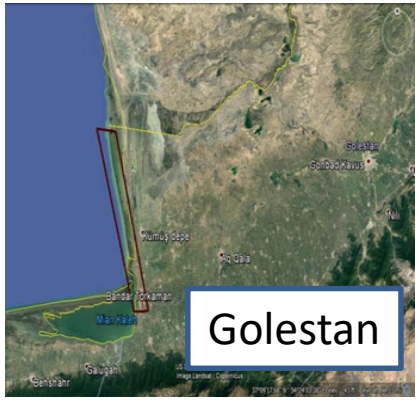
**In session held at 97/09/07 at RADAR station of Amirabad port**



**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



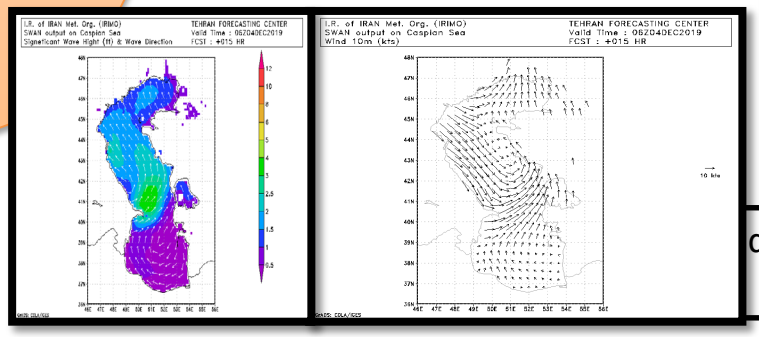


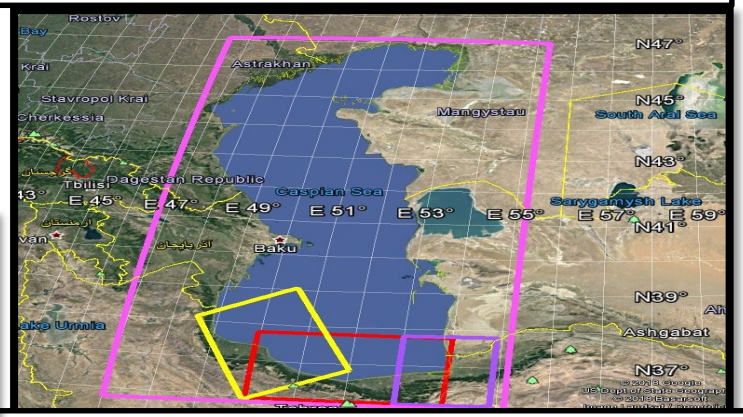

locations of southern Caspian Sea provinces ports

**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.

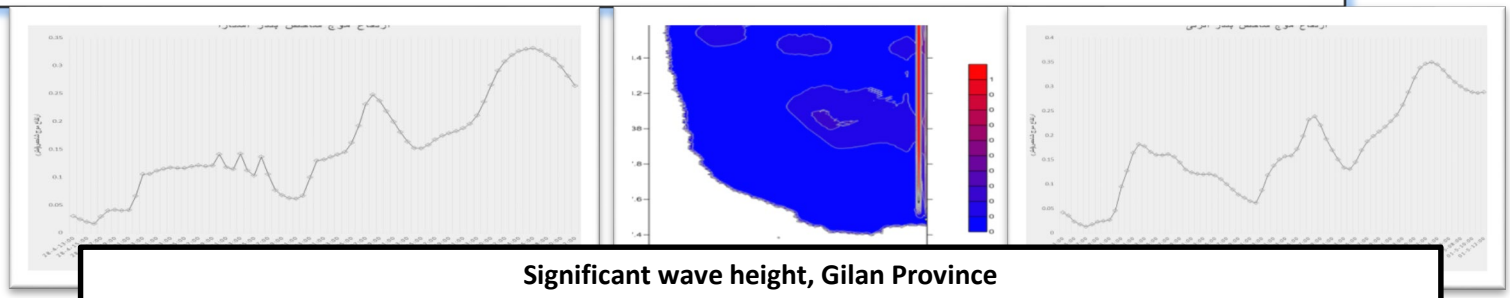
SWAN maps on Caspian Sea



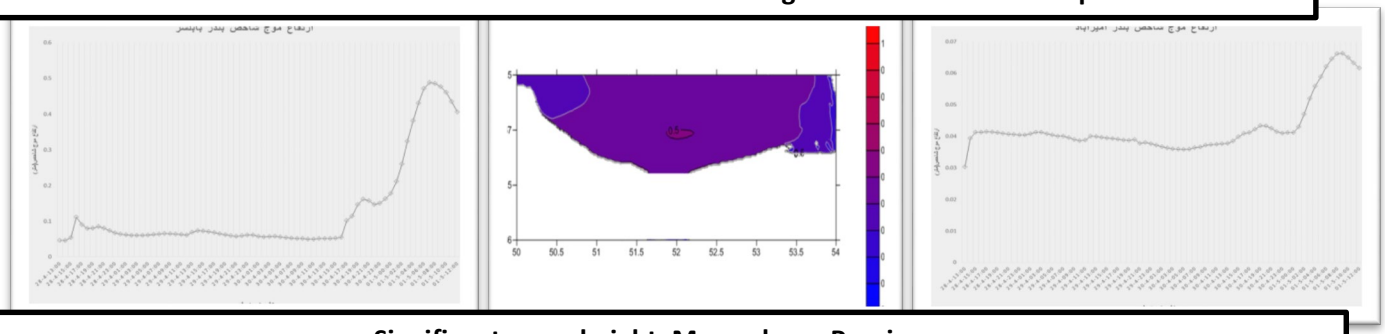

domain of Caspian Sea model and southern coastal provinces

**Swan model output for considerable wave in CASPIAN SEA**



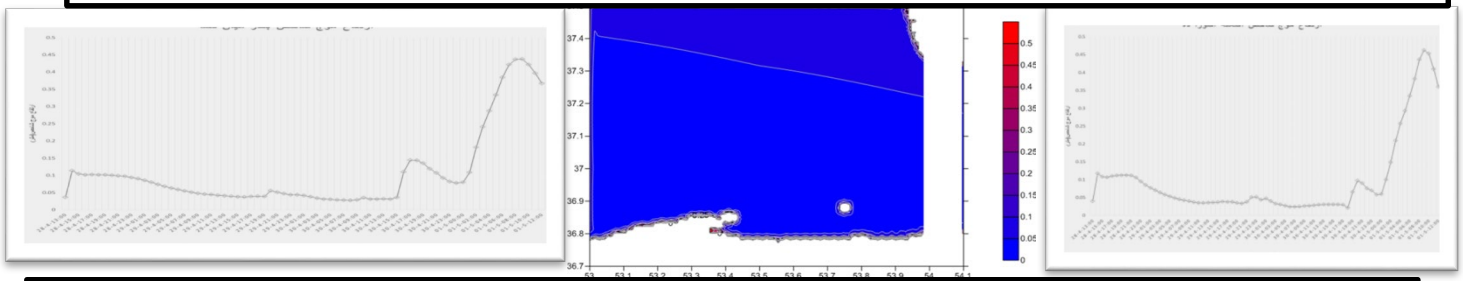
**Significant wave height, Gilan Province**

**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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## Astrakhan, Russia 25 October 2021

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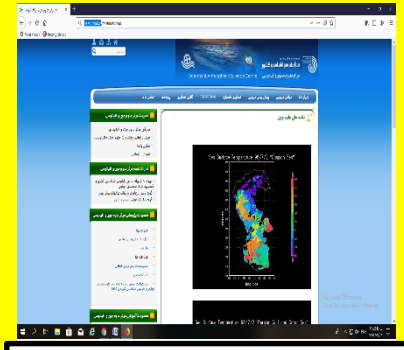
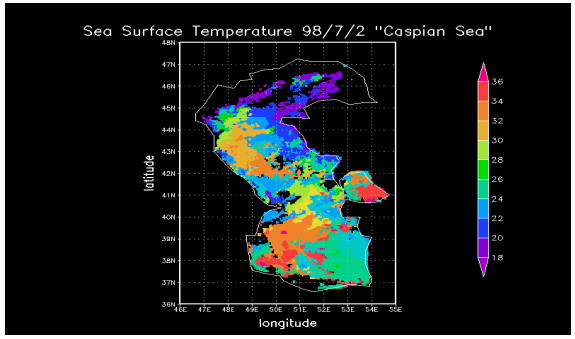
I. R. OF IRAN METEOROLOGICAL ORGANIZATION

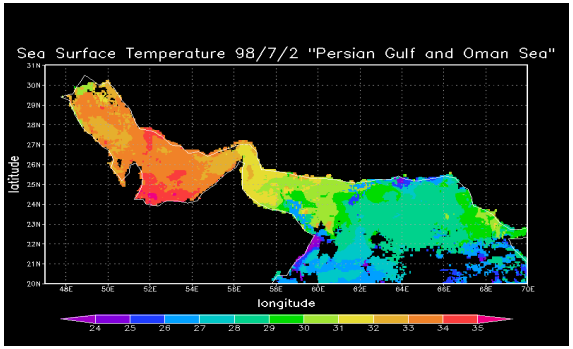
## Web site

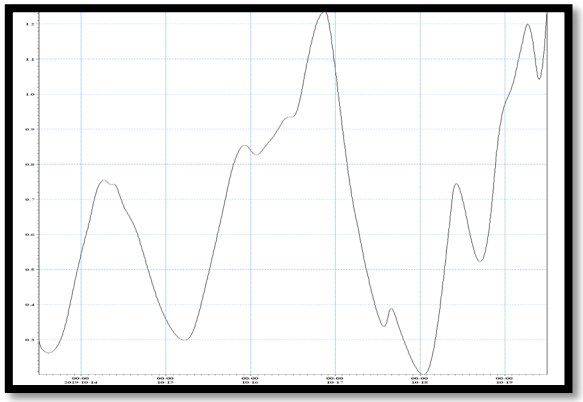


http://oasc.irimo.ir

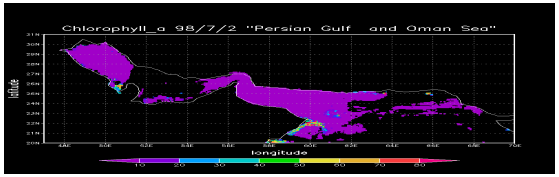
Caspian sea ,persian golf and oman sea
Sea surface temperature

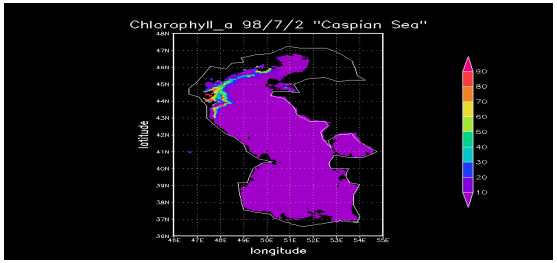


Mike 21 point forecast, significan wave height




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 ma meteorological information between the Caspian littoral states 200-2022 | 1 national enhanced data exchange system |

## Action Plan

7

Researches
2020-2023

6
Researches

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