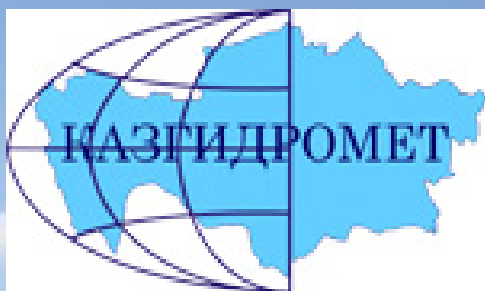**Ministry of Energy of the Republic of Kazakhstan**

Republic State Enterprise "Kazhydromet"

ACTIVITY OF NATIONAL HYDROMETEOROLOGICAL SERVIES OF THE KAZAKHSTAN IN THE CASPIAN SEA REGION D 2017 - 2018
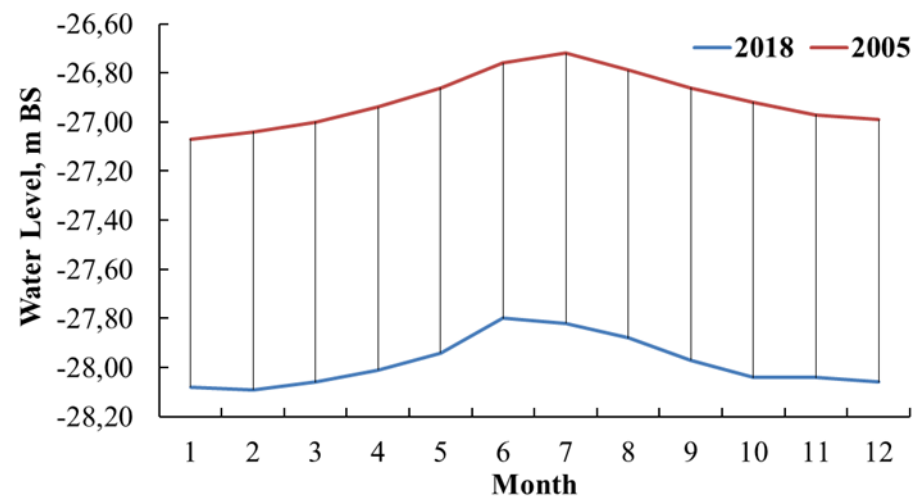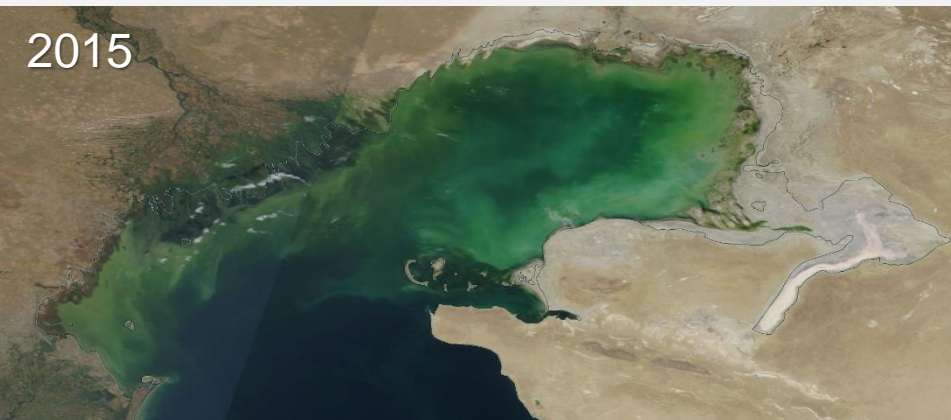
3-th (23) Session CASPCOM,
Ashgabat 30-31 October 2018

Hydrometeorological monitoring

Marine observations at four sea hydrometeorological stations are made: Peshnoy, Island Kulaly, Fort -Shevchenko, Aktau and six sea hydrological posts: Zhanbay, Igolkinskay banka, Fetisovo, Kuriyk, Saura and Peschaniy.

Hydrometeorological monitoring

Hydrometeorological monitoring

N	Name	Water level	Wave	Water temperature	Salinity	Ice phenomena		Visual observations of water pollution	Air temperature	Atmospheric phenomenon	Precipitation	Snow cover
						Ice condition	Thickness of ice and height of snow on ice					
1	Fetisovo	+	+	+	+			+	+	+		
2	Saura	+	+	+	+			+	+	+		
3	Peschaniy	+	+	+				+	+	+		
4	Kuriyk	+	+	+				+	+	+		
5	Zhambay	+		+	+	+	+	+	+	+		
6	Igolkinskya banka	+		+	+	+	+	+	+	+	+	+
7	Peshnoy	+		+	+	+	+	+			+	+
8	Aktau	+	+	+	+			+				
9	Fort-Shevchenko	+	+	+	+	+	+	+				
10	Island Kulaly	+	+	+	+	+	+	+				

Storm surges on the Caspian Sea
(2017 – September, 2018)

Point	2017		2018 (1-9)		Total
	Wind setup	Wind setdown	Wind setup	Wind setdown	
Zhambay	0	1	0	0	1
Peshnoy	13	19	20	17	69
Island Kulaly	0	1	1	2	4
Fort-Shevchenko	7	14	3	2	26
Saura	7	11	9	10	37
Peschany	1	2	0	0	3
Aktau	2	3	2	3	10
Fetisovo	3	16	1	5	25
Total	33	67	36	39	175

04-11.11.2017

02-05.12.2017

Hydrological monitoring
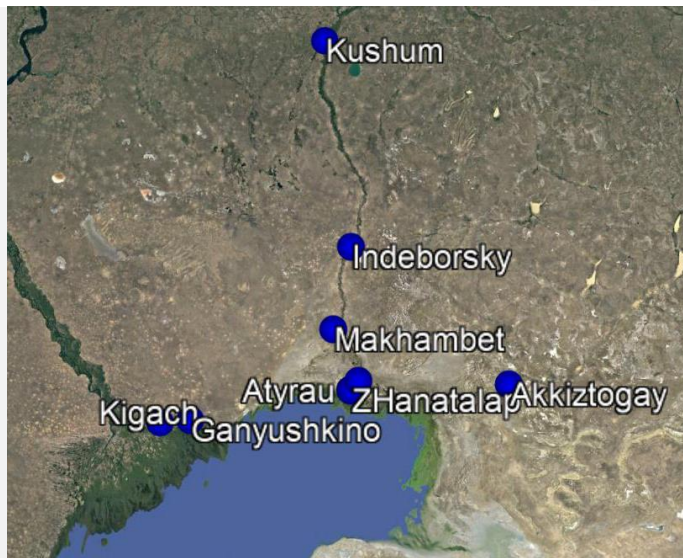
Hydrological network: Zhaiyk River – post Kushum, Zhaiyk River – post Indeborsky, Zhaiyk River – post Makhambet, Zhaiyk River – post Atyrau; Yaik Channel – post Erkenkala, Zolotoy rukav Channel – post Zhanatalap, Kigach Channel – post Kotyaevka, Sharonovka Channel – post Ganyushkino, Emba River – post Akkiztogay.
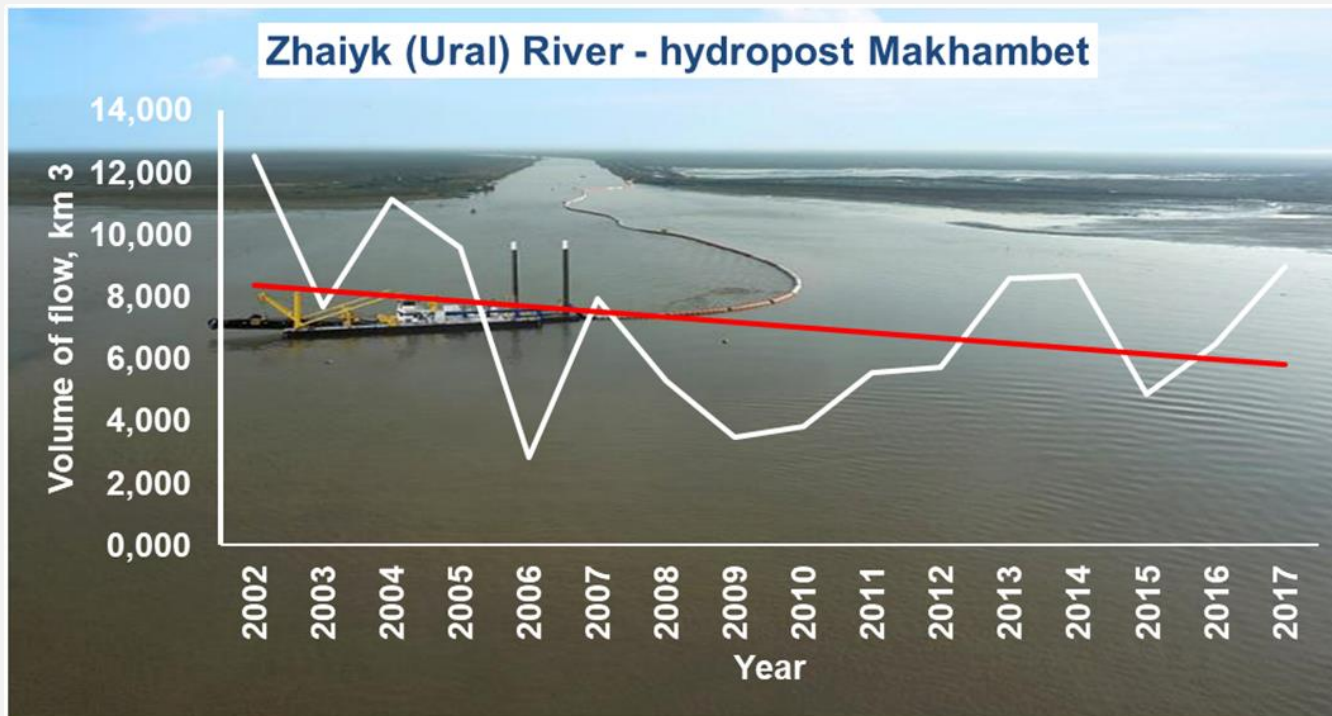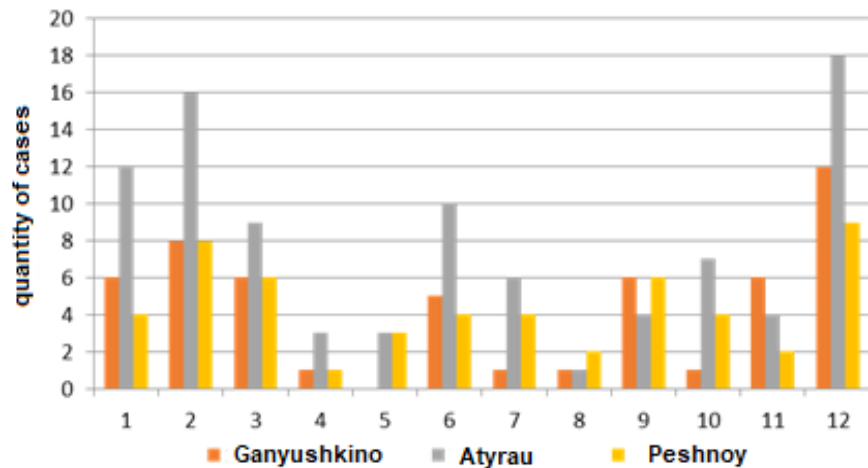
Meteorological monitoring

The meteorological network in the Caspian Region consists of 24 meteorological stations, 8 of which are stations of the international exchange (Atyrau, Noviy Ushtogan, Ganyushkino, Makat, Isatay, Sam, Fort- Shevchenko, Akkuduk).
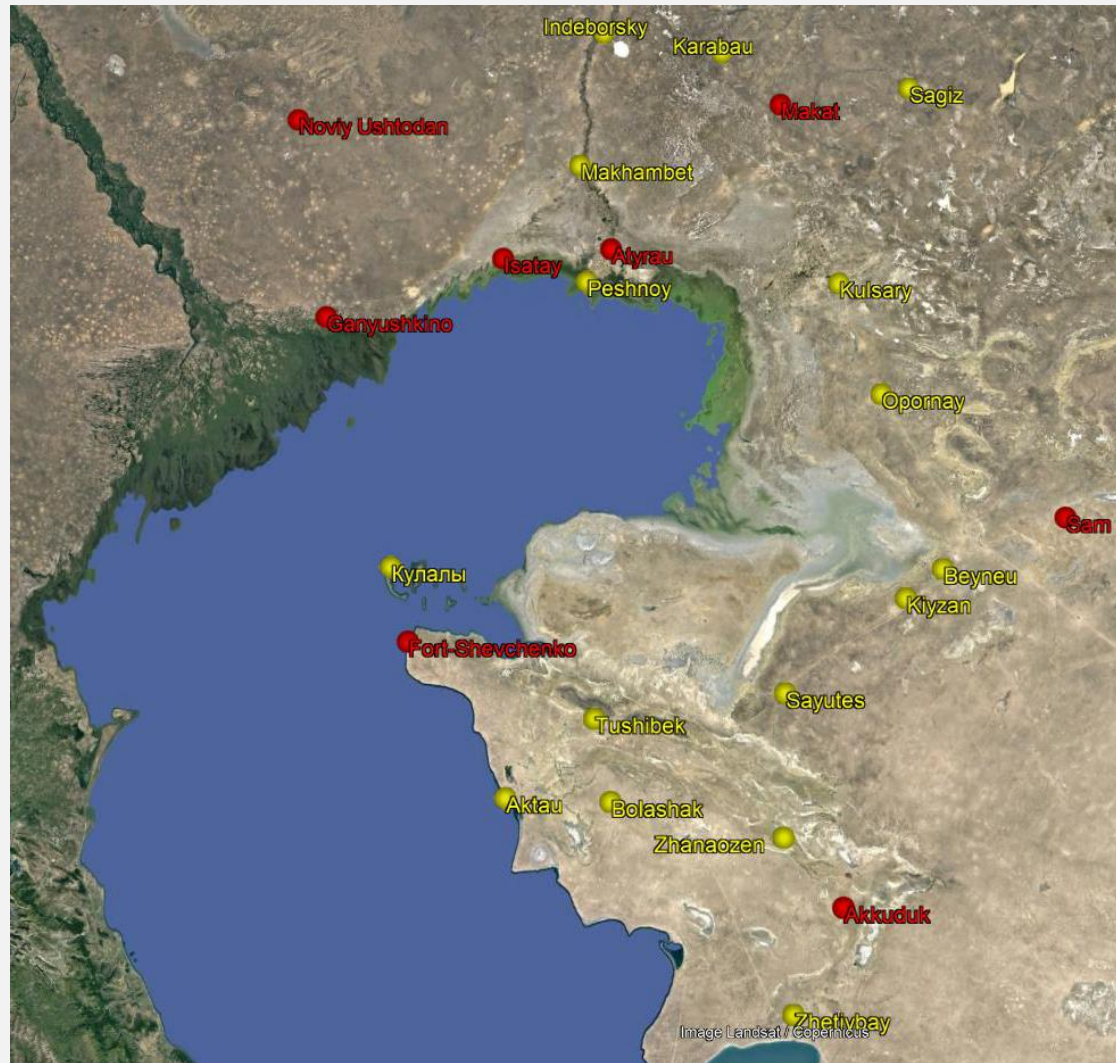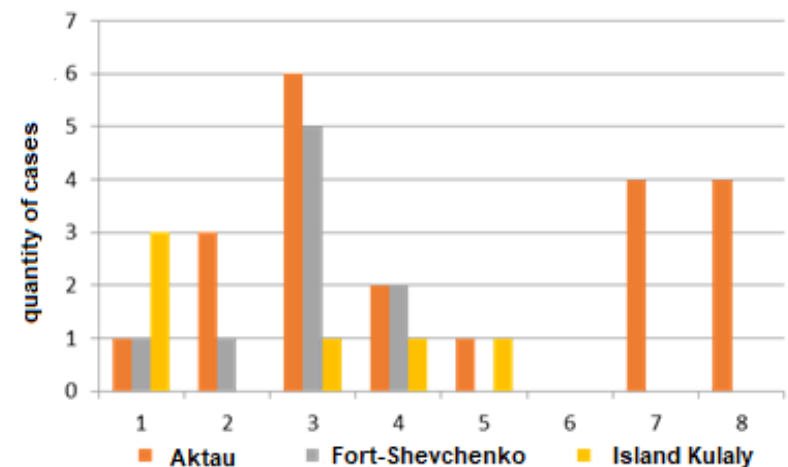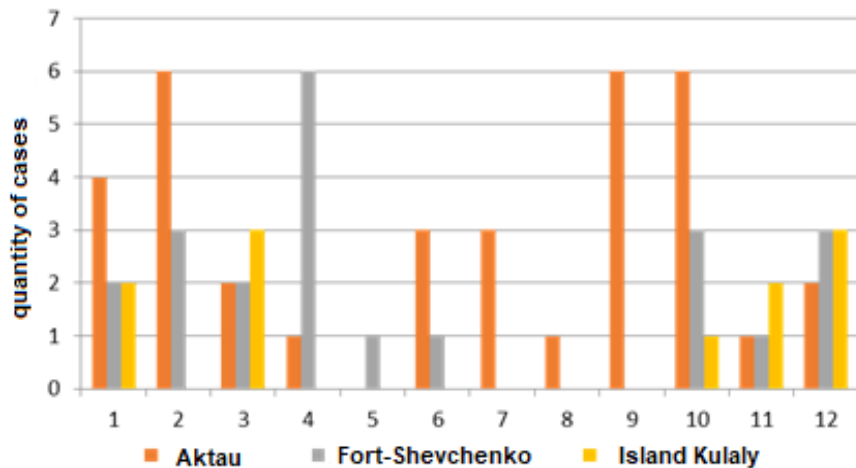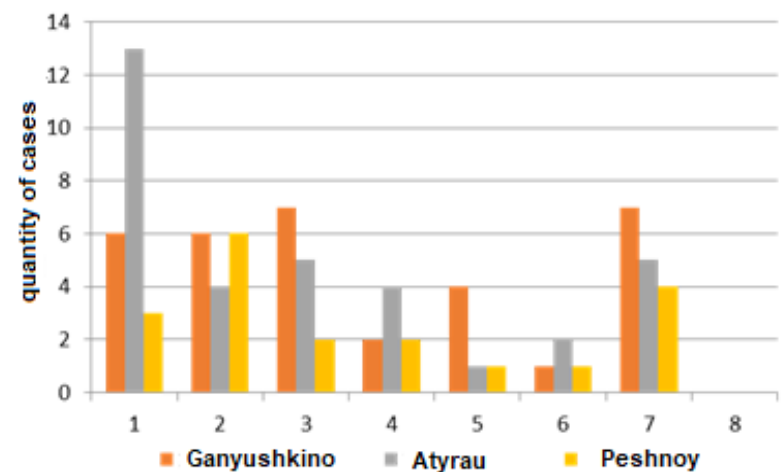
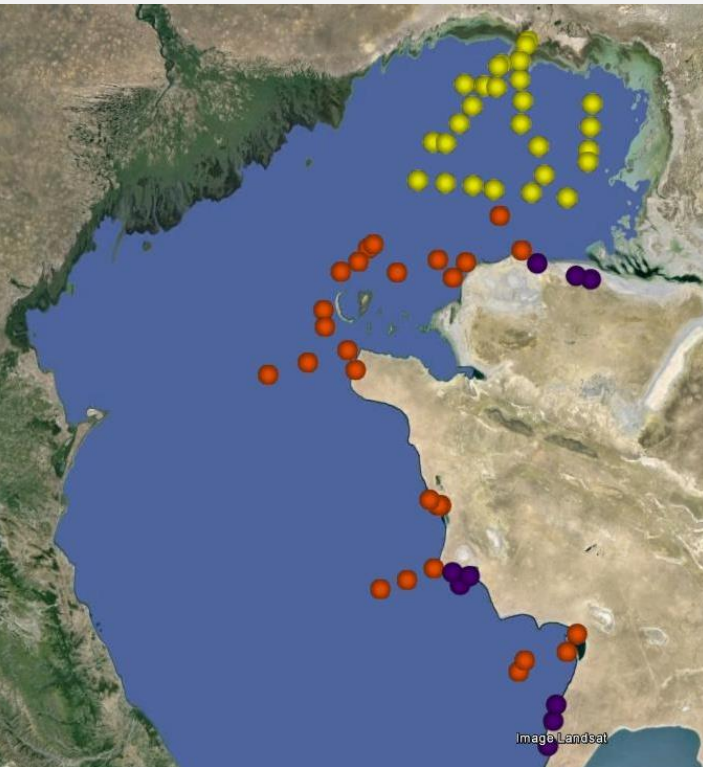# Frequency of a dangerous meteorological events (2017 - August, 2018)

Sea water and sediment monitoring

Sampling points of sea waters in the territory of "Seaport of Aktau"

Water Quality is observed in 31 points.
Water quality is determined by 46 indicators:
Temperature, Turbidity, Alkalinity, pH, Conductivity, Suspended matters, solid residue, Chemical Oxygen Demand, Water hardness, Dissolved oxygen, % oxygen saturation, Chlorides, Sulfates, Hydrocarbonates, Carbonates, Calcium, Magnesium, Sum of ions, BOD_5, Ammonium Salt, Nitrite nitrogen, Nitrate nitrogen, Sum of nitrogen, Phosphates, Total Phosphorus, Total Iron, Silicon, Phenol, Sodium, Potassium, Oil products, Anionic active agents, Lead, Copper, Zinc, Total Chrome, Chrome (6+), Chrome (3+), Fluorides, Boron, Mercury, Cobalt, Nickel, Manganese, Hydrogen sulfide, Cadmium.

Sediment Monitoring is observed 2 times per year (in the spring and autumn) in 37 points.
Is defined the following indicators: Oil products, Copper, Chrome (6+), Cadmium, Nickel, Manganese, Lead, Zinc.

Results of water Quality monitoring in 2017

Name of object	Index of impurity of water and water quality	Pollutant content		
		Quality indicators	Average concentration, mg/dm³	Кратность превышения
Caspian Sea	8,7 (normative clean water)	Dissolved oxygen	8,7	
	2,95 (normative clean water)	BOD$_5$	2,95	
	0,00 (normative clean water)			

Water temperature – 2,0…24,7℃, hydrogen ion exponent – 7,95, dissolved oxygen – 8,7 mg/dm³, BOD$_5$ – 2,95 mg/dm3. Increase of MPC isn't revealed. In comparison with 2016 the water quality hasn't changed.

Results of water Quality monitoring
in the first half of the year 2018

Name of object	Index of impurity of water and water quality	Pollutant content		
		Quality indicators	Average concentration, mg/dm^3	Кратность превышения
Caspian Sea	9,94 (normative clean water)	Dissolved oxygen	9,94	
	2,22 (normative clean water)	BOD$_5$	2,22	
	0,00 (normative clean water)			

Water temperature – 2,0…23,5℃, hydrogen ion exponent – 8,3, dissolved oxygen – 9,94 mg/dm^3, BOD$_5$ – 2,22 mg/dm3. Increase of MPC isn't revealed. In comparison with first half of the year 2017 the water quality hasn't changed.
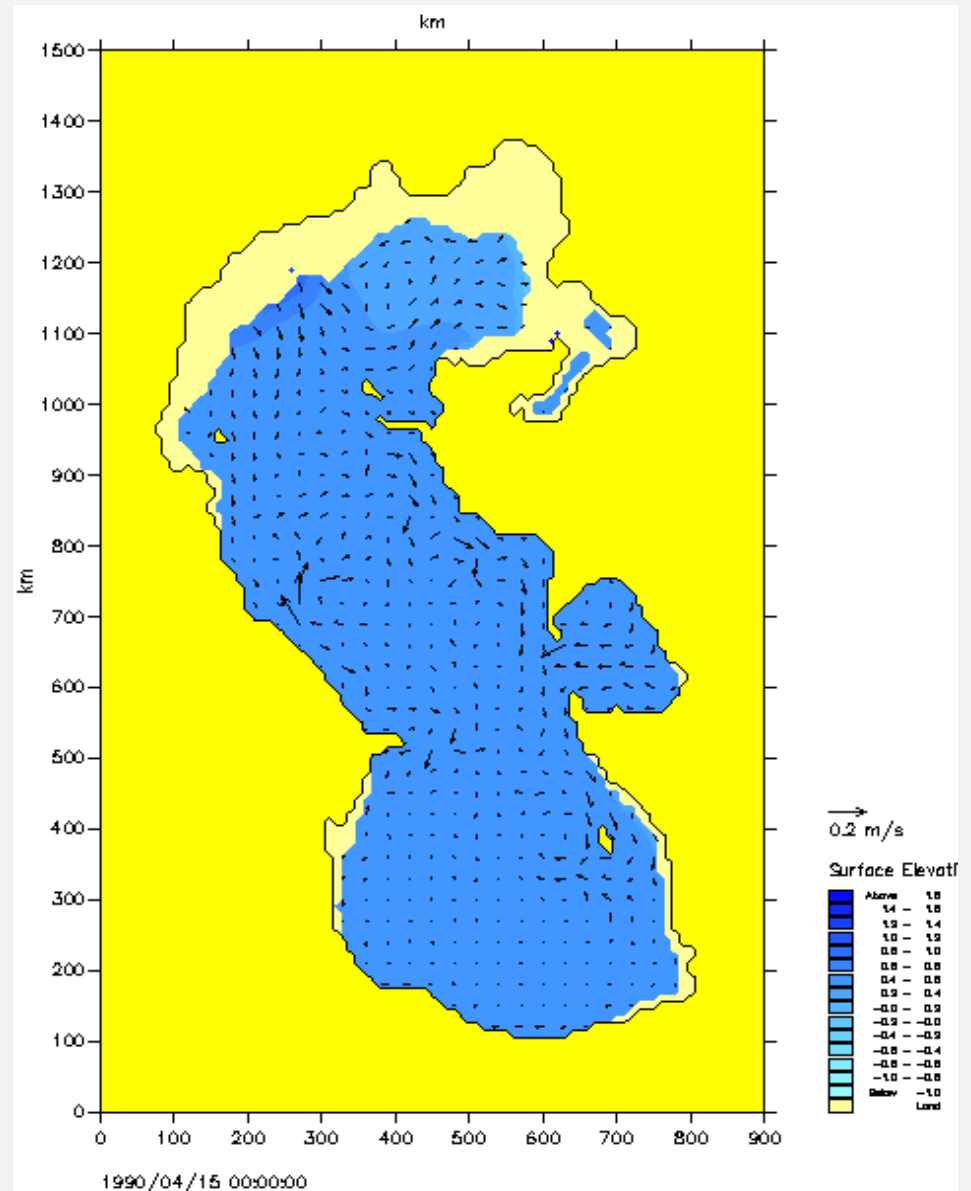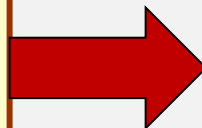
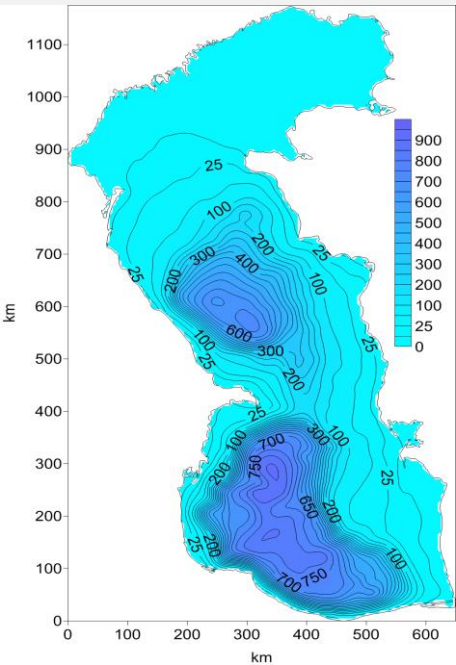# Warming system of the storm surges on the Caspian Sea

Information of Kazakhstan's stations and posts by e-mail 2 times per day
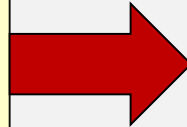
Information of ECMWF by ftp-channel

Advance time	PUV
0 hour (analysis)	
+6 hour	
+120 hour	

SWAN
Simulating WAves Nearshore

SWAN (Simulation Waves Nearshor) been developed by the Delphic Institute of technologies (Netherlands).

Input data:

➢ points of regular or triangularly grid;

➢ Caspian Sea bathymetry model;

➢ Wind speed and wind direction.

Выходные данные:

➢ Wave height and wave direction, wave period, Wind speed and wind direction in the selected points.
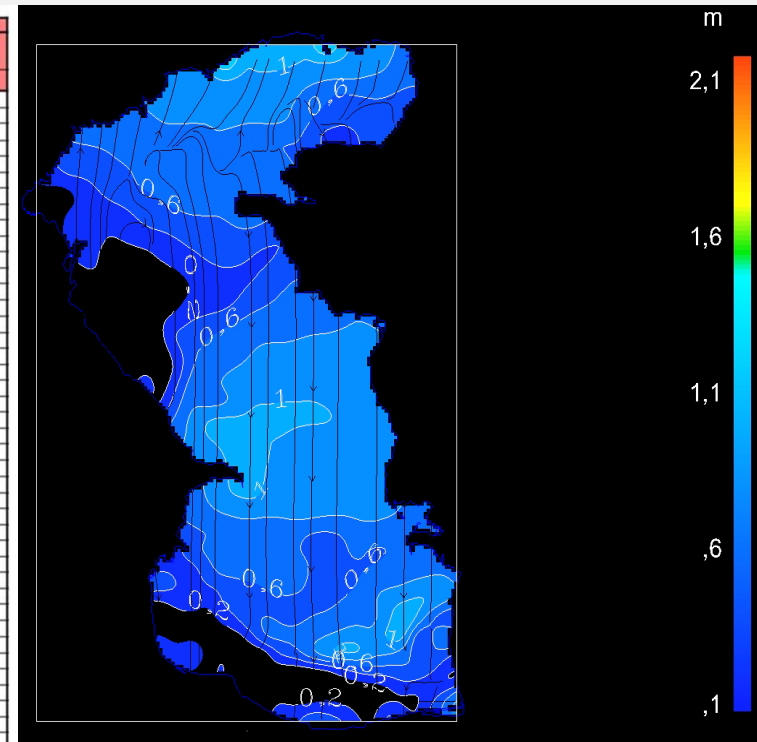
Scheme of the forecast with SWAN model

Ice Monitoring

Analysis of satellite images (satellites NOAA, MODIS Terra, MODIS Aqua …).

The analysis of instrumental observations of water temperature, ice thickness and height of snow on ice.

Visual control of ice formation and ice sheets, types and forms of ice.

МИНИСТЕРСТВО ЭНЕРГЕТИКИ РЕСПУБЛИКИ КАЗАХСТАН
РГП «КАЗГИДРОМЕТ»

НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ЦЕНТР

ОБЗОР ЛЕДОВОЙ ОБСТАНОВКИ В РАЙОНЕ СЕВЕРНОГО КАСПИЯ
ЗА 23 января 2018г.

Космический снимок Каспийского моря, 17 января 2018 г.
«MODIS Rapid Response Project at NAGA/GSFC»

Таблица – Основные элементы ледового режима Каспийского моря на 23.01.2018 г. по оперативным данным морских станций и постов

Пункт	Ширина припая, км	Толщи-на льда, см	Высота снега на льду, см	Количество неподвиж-ного льда, баллы	Количест-во чистой воды, баллы	Дрейф льда, баллы	Сплочён-ность льда, баллы
Морские станции и посты Казгидромета							
МГП Жанбай	>0,1	34		10	0	9	нб
М Пешной	0,5-1,0	10		10		9	нб
МГП Лагань	>0,1	9		10	0	11	10
МГП Иголкинская Банка	>0,1	12		10			

нс – сведений нет
нб – явление не наблюдалось

Составила вед инженер УГМИКМ Васенина Е.И.
Управление гидрометеорологических исследований Каспийского моря, РГП «Казгидромет»:
Тел. (727) 2 55 84 06; E-mail: caspian_almaty@mail.ru & kaspy@meteo.kz

Forecasting of an Ice Conditions with Global Forecasting System
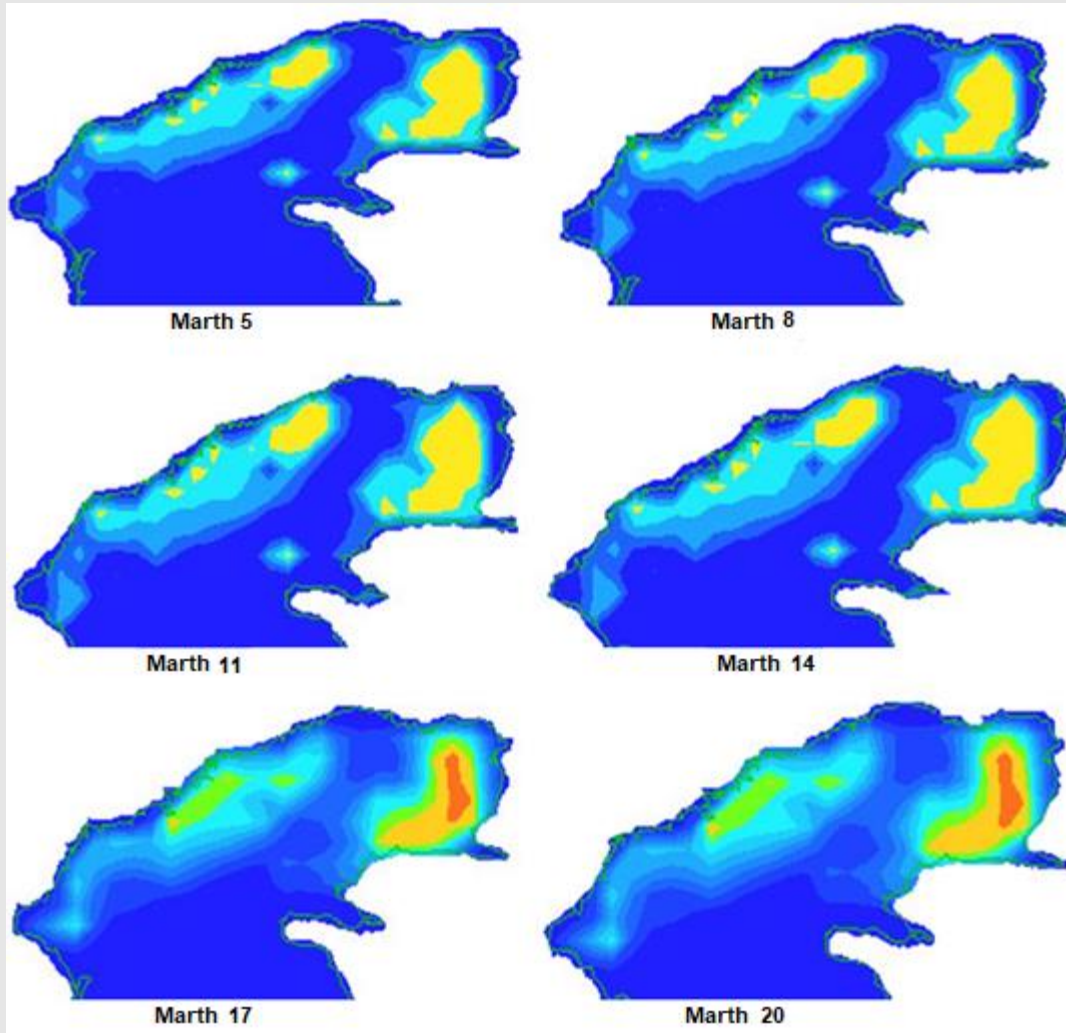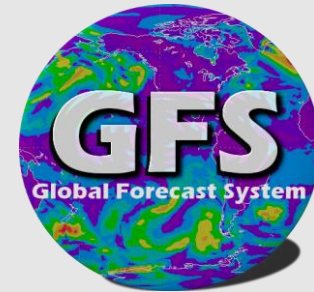
Global Forecasting System (GFS) is the weather numerical forecasting system containing global computer model and the variation analysis made by National Weather Service of the USA (NWS).

Mathematical model is started four times per day and gives forecasts for 16 days ahead with reduction of spatial resolution in 10 days.

The forecast for March 17, 2018 (GFS)

GFS

Initial forecast GFS

Final forecast GDAS
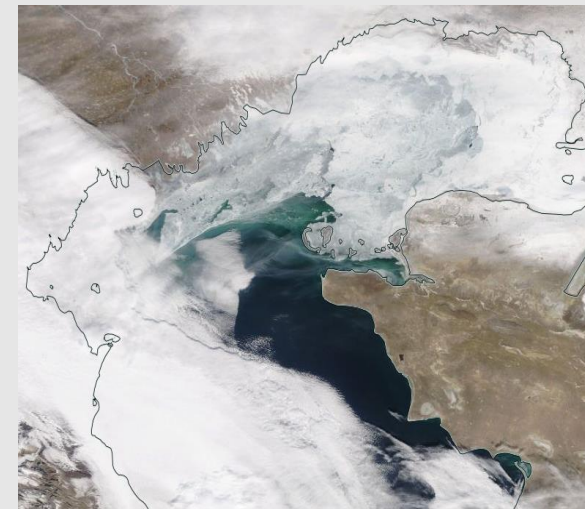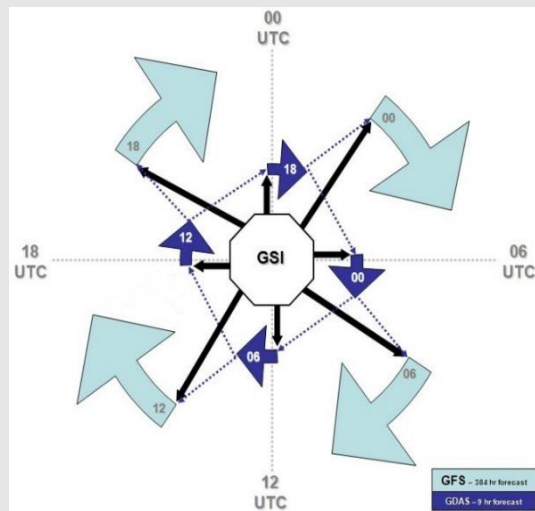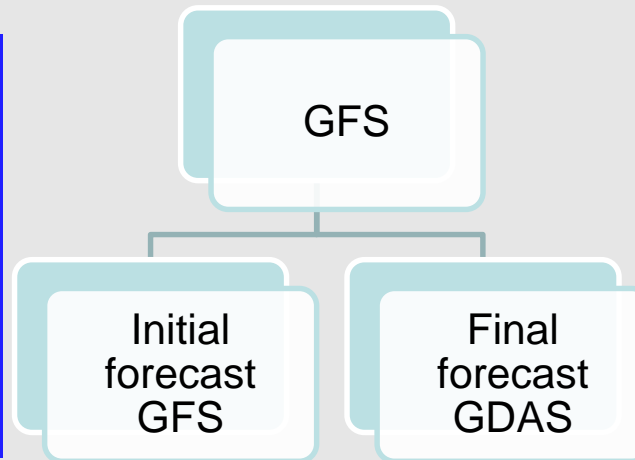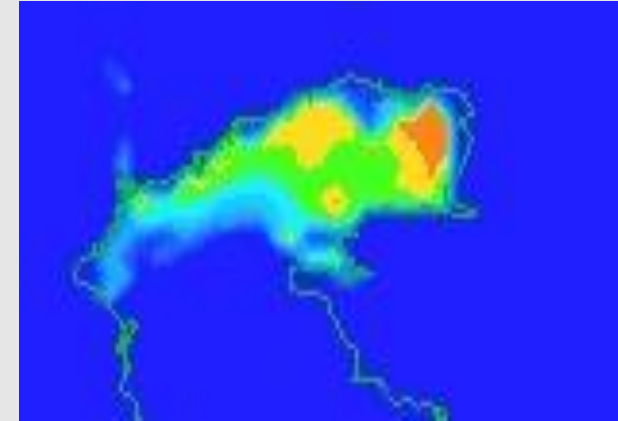
Difference between GFS and GDAS

Web-site RSE «Kazhydromet» https://kazhydromet.kz

Storm warning

RSE "KAZHYDROMET"
MINISTRY OF ENERGY
OF THE REPUBLIC OF KAZAKHSTAN

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Caspian Sea

Добавлено: 19 May 2017 11:22, Изменено: 23 May 2017 18:03

The **Caspian Sea** is the largest closed sea in the world, located on the continent of Eurasia. The coastline is 2,220 km is Kazakhstan.
The region of the Caspian Sea adjacent Kazakhstan, according to natural conditions, parts: the eastern part of the Northern Caspi part of the Middle Caspian. The eastern pa Caspian is shallow with a low coast and l bottom. Here the average depth is 2 m, a depth, in the region of the Ural Furrow, is 8 of the bottom is complicated by the presen furrows. It is a semi-enclosed reservoir, a hy which is formed in the conditions of the con the Urals and the Volga.

Foto by Akim Mengeu

It is practically isolated from the direct influence of the waters of the Middle Caspian. The eastern part of t water. The average depth is 200 m, and the maximum depth is up to 700 m.
The Caspian Sea and its catchment area is of great importance for the economies of the Caspian Kazakhstan. This unique reservoir with a diverse flora of fauna and hydrocarbon reserves. Socio-econom the coastal zone has a significant impact on the hydrometeorological regime. The level of the Caspian Sea during the year

The Caspian Sea hydrometeorological research Department

Caspian sea water surface status review

Caspian sea hydrometeorological research

Caspian sea ecological research

Forecast*
of the Caspian Sea water level for 27 September – 02 October 2018

In the northern part of the Caspian Sea the sea level fluctuation from storm surges is expected about minus 27,94 m with the maximal increase up to minus 27,39 m and its minimal downturn up to minus 28,24 m.

In the middle part of the Caspian Sea the sea level fluctuation is expected about minus 28,08 m with rise up to minus 27,81 m and recession up to minus 28,56 m.

* Calculations are received at use of the hydrodynamic module MIKE 21of the Danish Hydraulic Institutes adapted to conditions of the Caspian Sea in the RSE "Kazhydromet". At account the water level observational data and numerical forecast of the baric field were used (probability 24-120 h).

Caspian Sea Water Surface, 20-26 September 2018

In the Caspian Sea Northern Part the mean sea level corresponded to mark minus 27,95 m, maximal – minus 27,81 m, minimal – minus 28,12 m (using observational data from the Kazakhstan's sea stations and posts: Peshnoy, Zhanbay, Kulaly Island and Roshydromet's sea station – Tuyleny Island).

In the Caspian Sea Middle Part the mean sea level corresponded to mark minus 28,08 m, maximal – minus 27,84 m, minimal – minus 28,50 m (using observational data from the Kazakhstan's sea stations and posts: Fort-Shevchenko, Aktau, Fetisovo and Roshydromet's sea station - Makhachkala).

Caspian sea ecological research

"Hydrometeorology and Ecology" scientific and technical magazine

Astana

Weather forecast information is not available at this moment.

World Weather Information Service

A lot of thanks
for attention!