Ministry of Energy of the Republic of Kazakhstan

ЧЛРОМЕ



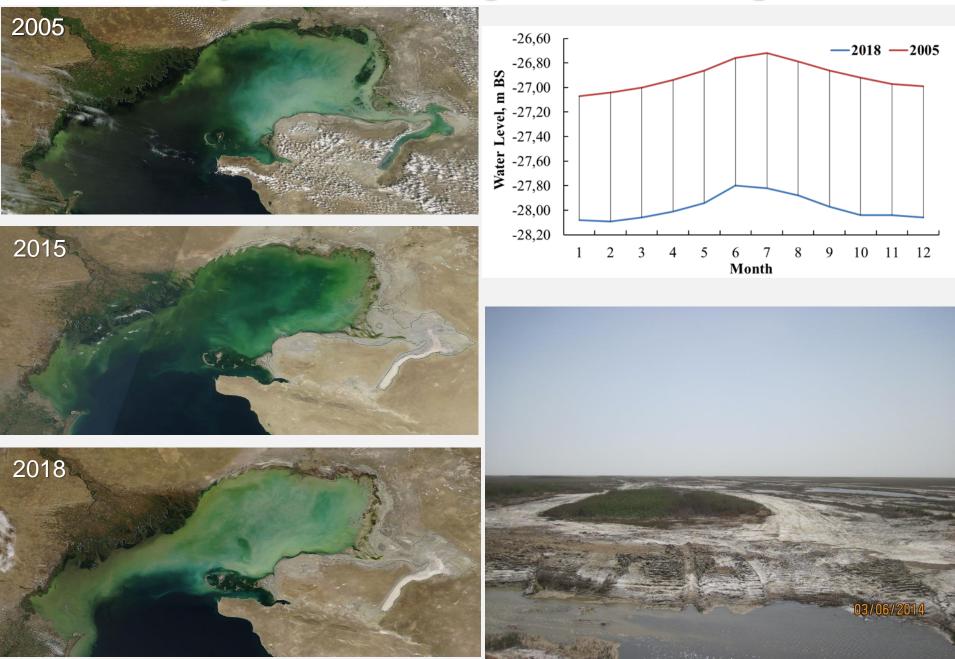
ACTIVITY OF NATIONAL HYDROMETEOROLOGICAL SERVIES OF THE KAZAKHSTAN IN THE CASPIAN SEA REGION D 2017 - 2018 3-th (23) Session CASPCOM, Ashgabat 30-31 October 2018

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

		-		ature		lce ph	enomena	ations ution	ure	ic	ų	er
z	Name	Water level	Wave	Water temperature	Salinity	Ice condition	Thickness of ice and height of snow on ice	Visual observations of water pollution	Air temperature	Atmospheric phenomenon	Precipitation	Snow cover
1	Fetisovo	+	+	+	+			+	+	+		
2	Saura	+	+	+	+			+	+	+		
3	Peschaniy	+	+	+				+	+	+		
4	Kuriyk	+	+	+				+	+	+		
5	Zhambay	+		+	+	+	+	+	+	+		
6	lgolkinskya banka	+		+	+	+	+	+	+	+	+	+
7	Peshnoy	+		+	+	+	+	+			+	+
8	Aktau	+	+	+	+			+				
9	Fort- Shevchenko	+	+	+	+	+	+	+				
10	Island Kulaly	+	+	+	+	+	+	+				

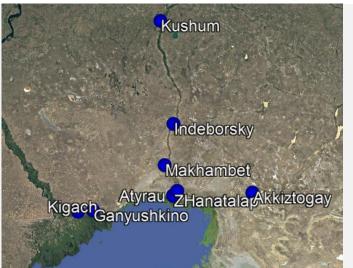
Storm surges on the Caspian Sea (2017 – September, 2018)

Point	2	017	201	8 (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

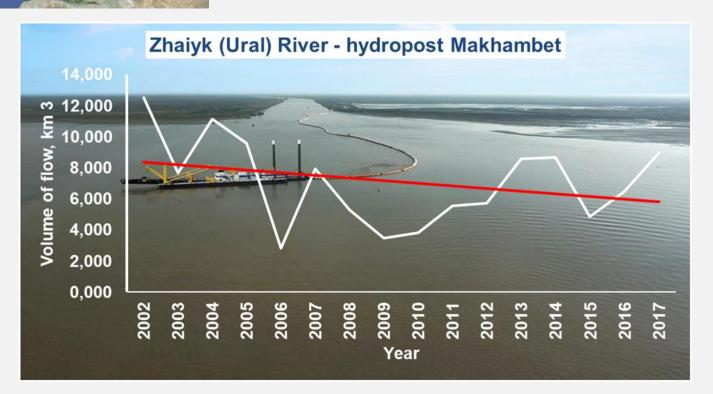




Hydrological monitoring

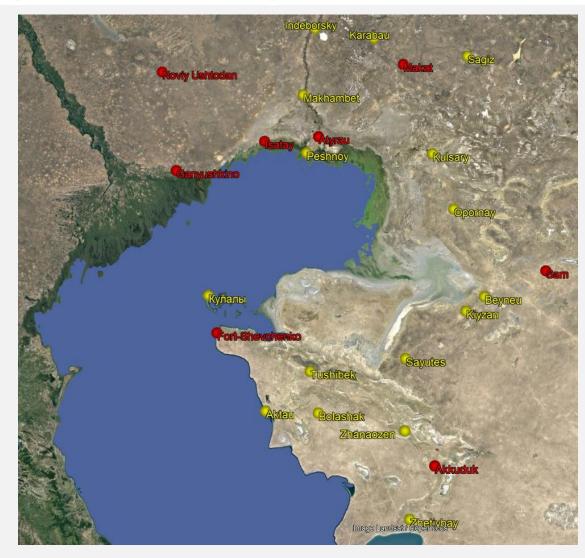


Hydrological network: Zhaiyk River – post Kushum, Zhaiyk River – post Indeborsky, Zhaiyk River – post Makhambet, Zhaiyk River – post Atyrau; Yaik Channel – post Erkenkala, Zolotoy rukav Channel – post Zhanatalap, Kigach Channel – post Kotyaevka, Sharonovka Channel – post Ganyushkino, Emba River – post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

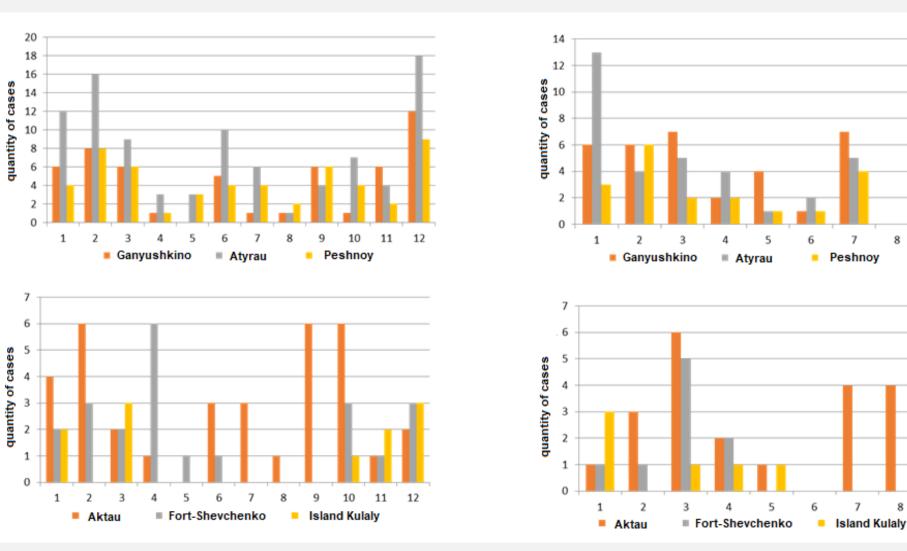


Meteorological monitoring

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, BOD₅, 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	Pollutant content				
······	quality			Кратность превышения		
	8,7 (normative clean water)	Dissolved oxygen	8,7			
Caspian Sea	2,95 (normative clean water)	BOD ₅	2,95			
	0,00 (normative clean water)					

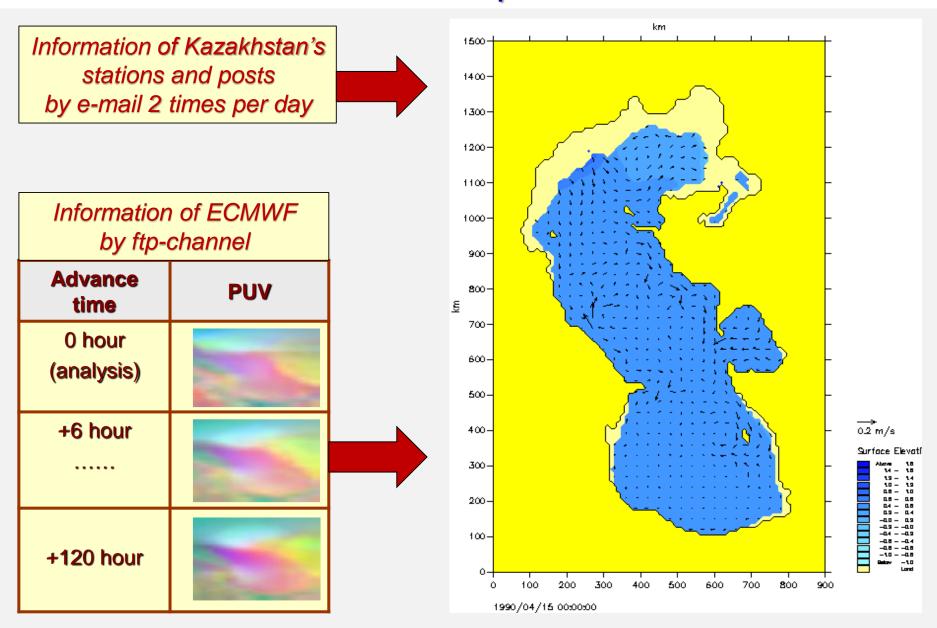
Water temperature -2,0...24,7 °C, hydrogen ion exponent -7,95, dissolved oxygen -8,7 mg/dm³, BOD₅-2,95 mg/dm³. Increase of MPC isn't revealed. In comparison with 2016 the water quality hasn't changed.

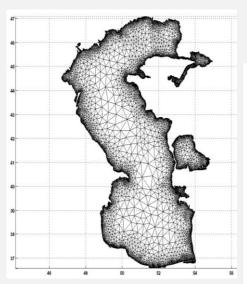
Results of water Quality monitoring in the first half of the year 2018

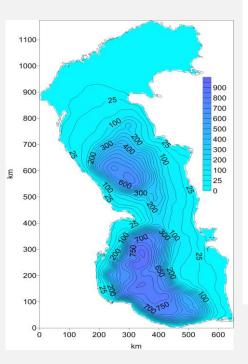
Name of object	Index of impurity of water and water	Pollutant content					
	quality	Quality indicators	Average concentration, mg/dm ³	Кратность превышения			
	9,94 (normative clean water)	Dissolved oxygen	9,94				
Caspian Sea	2,22 (normative clean water)	BOD ₅	2,22				
	0,00 (normative clean water)						

Water temperature -2,0...23,5 °C, hydrogen ion exponent -8,3, dissolved oxygen -9,94 mg/dm³, BOD₅ -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







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:

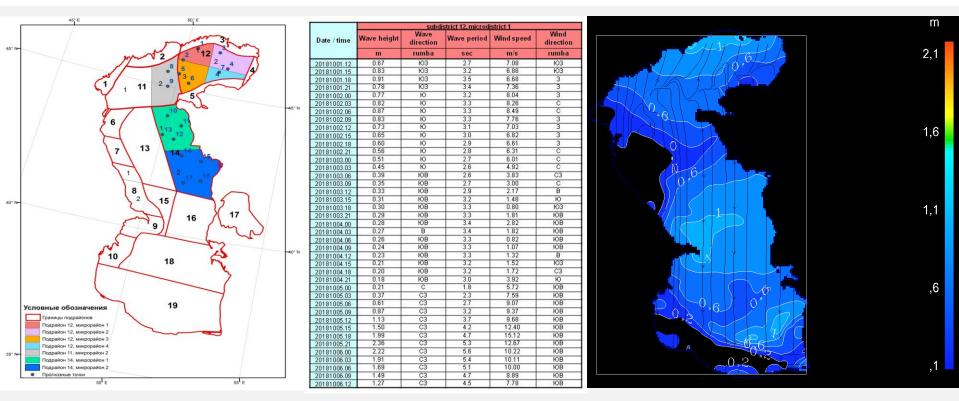
Wave height and wave direction, wave period, Wind speed and wind direction in the selected points.

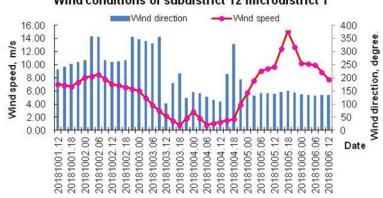
SWAN Simulating WAves Nearshore

	C\SWAN\October_2018\01-0610_1\20181001.swn - Notepa
	Правка Поисс Вид Кодировки Синтакски Опции Инструменты Макроси Запуск Плагины Вкладки ?
2	🗑 🖻 😚 🦓 🐇 🦄 🖄 🗇 🗲 📾 🧤 🔍 🤫 🖫 🖫 🗉 🔢 🗷 🖬 🖉 🖉 🖘 🖬
181	2 mm [2]
-	
	• • • • • • • • • • • • • • • • • • •
	PROJ ' Casov' 'F31'
	4 Field case: Campian Sea area
	4 Time of simulation: 01 okradpa 2018 1200 - 06 okradpa 2018 1200
	4 MODEL INPUI
	6
	4SET 1EVEL 0.30
	6
	SET maxerr 200
	COORDINATES SPHERICAL
	CORID REGULAR 46 36 0. 9 12 36 48 CIRCLE 36 0.01 1. 31
	e
	INPGRID BOTTOM 46 36 0. 70 100 0.12857 0.12
	READINP BOT 1. 'batim_regul.BOT' 3 0 FREE
	ę
	ê
	INPGRID WIND REG 45 36 0. 52 60 0.25 0.25 EXC 0. NOHSTAT 20181001.120000 6 HR 20181006.120000
	READINF WIND 1. 'wind_20181001.DAT' 1 0 0 0 FREE
	GEN3
	BREAKING
	FRICTION
	TRIADS
	DIFFRAC
	ē .
	ç+
	POINTS 'Caspy' FILE 'tochki_17.loc'
	THE REAL PROPERTY AND AND AND THE VENUE AND
	TABLE 'Caspy' 'Prognoz_20181001 dat' TIME XF YF HS DIR PER WIND OUTPUT 20181001.120000 3 HR 20181006.120000
	CCMPUTE NCNSTAI 20181001.120000 1 HR 20181006.120000
	AMEATE BARDINI STIRIATIINATIIAATIIAATIIAATIIAA
	e set itest-1 in order to get detailed information in FRINT file
	4 des recents to Ades des deserves reconsidered en contra trac
	5109

	Billion C Prognez_20	181001 dat 🖾						
	k							
11	1		SWAR version:					
1	N Run:F31 Table:Co	1203	CHAR VEISIONI	(1×10)				
\$	Time	Xp	Tp	Haig	Dir	Period	X-Windv	Y-Windy
2	4 []	[degr]	[degr]	[m]	[degr]	[sec]	[0/#]	[m/a]
				100				0-0-1
	20181001.120000	50.500	46.5000	0.59510	227.609	2.5730	-4.3516	-4.7683
60	20181001.120000	50.000	46.0000	0.67448	216.614	2.7092	-5.6797	-4.2214
	20181001.120000	51.500	46.5000	0.53239	242.267	2.4404	-2.7110	-5.1550
	20181001.120000	52.000	46.0000	0.53889	250.653	2.4546	-1.9571	-5.5730
	20181001,120000	50,000	45,5000	0.69383	229.682	2,7388	-4.6992	-5.5378
	20181001.120000	\$0.500	45.2500 45.8300	0.54392	222.691	2.4657	-4.3868	-4.0456
40	20181001.120000	51.670	45,8300	0.55295	242.155	2.4987	-2.8602	-5.4163
15	20181001.120000		45.5000	0.70025	212.198	2.7485	-6.2032	-3.9050
16	20181001.120000	49.670	45.0000	0.55250	234.717	2.4848	-3.4677	-4.9242
	20181001.120000	50.000	44.0000	0.39522	225.305	2.1493	-3.1446	-3.1785
	20181001.120000	50.670	43.7500	0.30999	257.874	2.0037	-0.8071	-3-6227
	20101001.120000	50.500	43.2500	0.37199	216.001	2.0867	-3.3555	-2.5103 -1.0699
	20181001.120000	50.000 51.000	43.0000 42.7500	0,49337	200-536	2-3622	-4.9922 -2.8750	-1.0099
	20181001.120000		42.6700	0.54493	232.780 265.315	2.2285	-0.5037	-5.8823
	20181001.120000	52.000	42.0000	0.43241	257.232	2.2402	-1.0586	-4.6746
	20181001.120000	51.000	41.6700	0.44733	244.778	2.2727	-2.0844	-4.4402
	20181001.150000	\$0,500	46,5000	0,50700	226.129	2.5592	-4.8956	-3,7908
	20181001.150000	50.000	46.0000	0.82987	217-647	3.1763	-6.1011	-3.1743
	20181001,150000	51,500	46.5000	0.64914	240,820	2.8538	-3.6994	-4.5194
	20181001,150000	52.000	46.5000	0.64150	249.767	2.8830	-1.8777	-4.4374
	20181001,150000	50.000	45.5000	0,04491	229-014	3,1921	-5.5510	-4.2232
	20181001,150000	50,500	45,2500	0,68288	227.995	2.9304	-4.9077	-0.4920
	20181001.150000	51.670	45.0300	0.63723	242.390	2.0094	-2.6019	-4.2504
	20181001.150000	49.500	45,5000	0.89680	214.447	3.2328	-7.1188	-3.1910
	20181001.150000	49.670	45.0000	0.74542	234.828	3.0168	-6.2410	-3.9836
54	20181001.150000	\$0.000	44.0000		227.915	2.6021	-5.9234	-2.5400
	20181001.150000	50.670	43.7500	0.49550	261.772	2.6702	-4.2257	-3.9600
36	20181001.150000	50.500	43.2500	0.40408	224.505	2.3649	-3.1544	-2.7533
	20181001.150000	50.000	43.0000	0.54675	204.136	2.6903	-4.0756	-2.1551
	20181001.150000	51.000	42.7500	0.41647	232.458	2.4059	-2.7805	-3.7482
19	20101001.150000	51.830	42,6700	0,69315	267.926	2,9300	-2.7041	-5.6620
10 I	20181001.150000	52.000	42.0000	0.50079	261.733	2.6762	-0.3921	-4.3690
11	20181001.150000	51.000 50.500	41.6700 46.5000	0.51506	240.914 221.527	2.6910 2.5419	-2.6643	-3.6482 -2.6807
	20181001.180000	50.000	46.0000	0.91228	217.315	2.5419	-6.3614	-2.6807
	20181001.180000	51.500	46.5000	0.70139	237.389	3.1813	-4.5489	-3.6885
	20181001.180000	52,000	46.0000	0.66060	246.500	3.3087	-1.7872	-3.2744
	20181001.180000	50.000	48 5000	0.96610	228.908	3.5550	-6.1310	-2.6690
	20181001.180000	50.500	45.5000	0.75101	231-085	3.3210	-5.3536	-2.8799
	20181001.180000	51.670	45.8300	0.64236	241.510	3.2752	-2.4789	-3.0441
	20181001.180000	49.500	45.5000	1.07229	216.901	3.6359	-7.9122	-2.4151
	20181001.180000	49.670	45,0000	0,92353	228,410	3,4389	-8.3986	-2.5073
	20181001.180000		44.0000	0.70026	221.819	2.9720	-8.2794	-1.6573
	20181001.180000	50.670	43.7500	0.66921	247.757	3.0342	-7.0606	-3.4269
	20181001.180000	50,500	43.2500	0.45061	236.025	2.7265	-2.9357	-2.9737
54	20181001.180000	50.000	43.0000	0.51547	209.994	2.0873	-3.0645	-2.3955
55	20181001.180000	51.000	42.7500	0.42219	233.193	2.5873	-2.6857	-3.7119
56	20101001.100000	51.830	42.6700	0.72309	255.629	3.1734	-4.8109	-4.6915
17	20181001.180000	52.000	42.0000	0.52544	266.757	3.0575	0.2870	-3.9697
50	20181001.180000	51.000	41.6700	0.56705	235.765	3.0914	-3.1349	-2.6852

Scheme of the forecast with SWAN model





Wind conditions of subdistrict 12 microdistrict 1



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

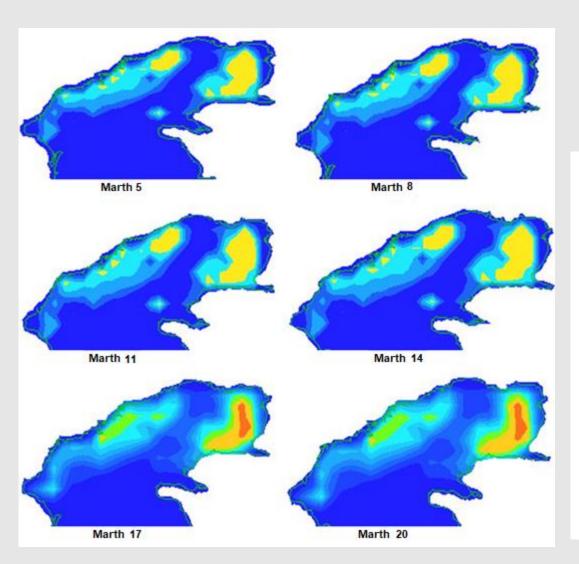
Пункт	Ширина припая, км	Толщи- на льда, см	Высота снега на льду, см	Количество неподвиж- ного льда, баллы	Количест- во чистой воды, баллы	Дрейф льда, баллы	Сплочён- ность льда, баллы
- 10.22 V2		Морск	ие станции	и посты Казг	идромета		9 X 545
МГП Жанбай	>0,1	34		10	0	9	нб
М Пешной	0,5-1,0	10		10		9	нб
МІП Лагань	>0,1	9		10	0	11	10
МГП Иголкинская Банка	>0,1	12		10			

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: <u>caspian_almaty@mail.ru</u> & <u>kaspy@meteo.kz</u>

Forecasting of an Ice Conditions with Global Forecasting System



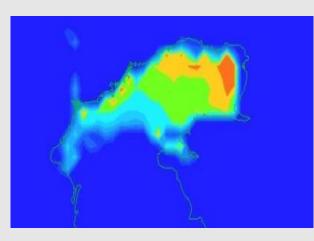


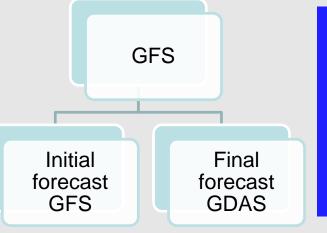
Global Forecasting System (GFS) is the weather numerical forecasting system containing global computer model and the variation analysis made by National Weather Service of the USA (NWS).

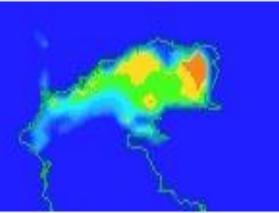
Mathematical model is started four times per day and gives forecasts for 16 days ahead with reduction of spatial resolution in 10 days.

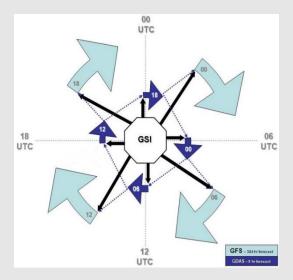
The forecast for March 17, 2018 (GFS)

Check the forecast for March 17, 2018 (GDAS)

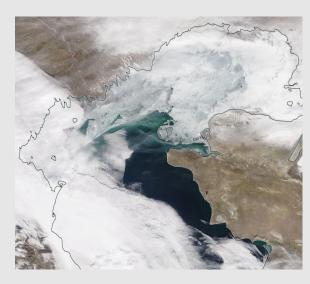












Difference between GFS and GDAS

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

ҚАЗ	РУС	ENG	Storm warning				6	ж	0	2
(Khaijupe		INISTRY OF E	ZHYDROMET" INERGY SLIC OF KAZAKHSTAN	Q	Споиск по сайту		🚠 Sitemap <table-cell-columns> 🖌 Feedback</table-cell-columns>			
HYDROM	ETEROLOG	Y CENTER	HYDROLOGY	CLIMATE	ECOLOGY	CASPIAN SEA	SERVICES	A	BOUT	
Home / Ca	ispian sea									
Caspia	an Sea						Caspian sea water review	surface	status	
🏥 Добавлен	но: 19 Мау 2	017 11:22, Изм	иенено: 23 Мау 2017 18:03				Caspian sea hydro research	meteoro	ological	
			. /	The Caspian Sea	is the largest closed se	a in the world, located	Caspian sea ecolos	gical rese	earch	

during the year

water. The average depth is 200 m, and the maximum depth is up to 700 m.

The **Caspian Sea** is the largest closed sea in the wo 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 lbottom. Here the average depth is 2 m, *i* depth, in the region of the Ural Furrow, is 8 of the bottom is complicated by the presenfurrows. It is a semi-enclosed reservoir, a hwhich is formed in the conditions of the corthe Urals and the Volga.

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



Ecology" scientific and technical magazine

Astana	
Weather forecast information is available at this moment.	snot
World Weather Information Service	(1)

The Caspian Sea hydrometeorological research Department

It is practically isolated from the direct influence of the waters of the Middle Caspian. The eastern part of t

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 v

Foto by Akim Mengeu

A lot of thanks for attention!