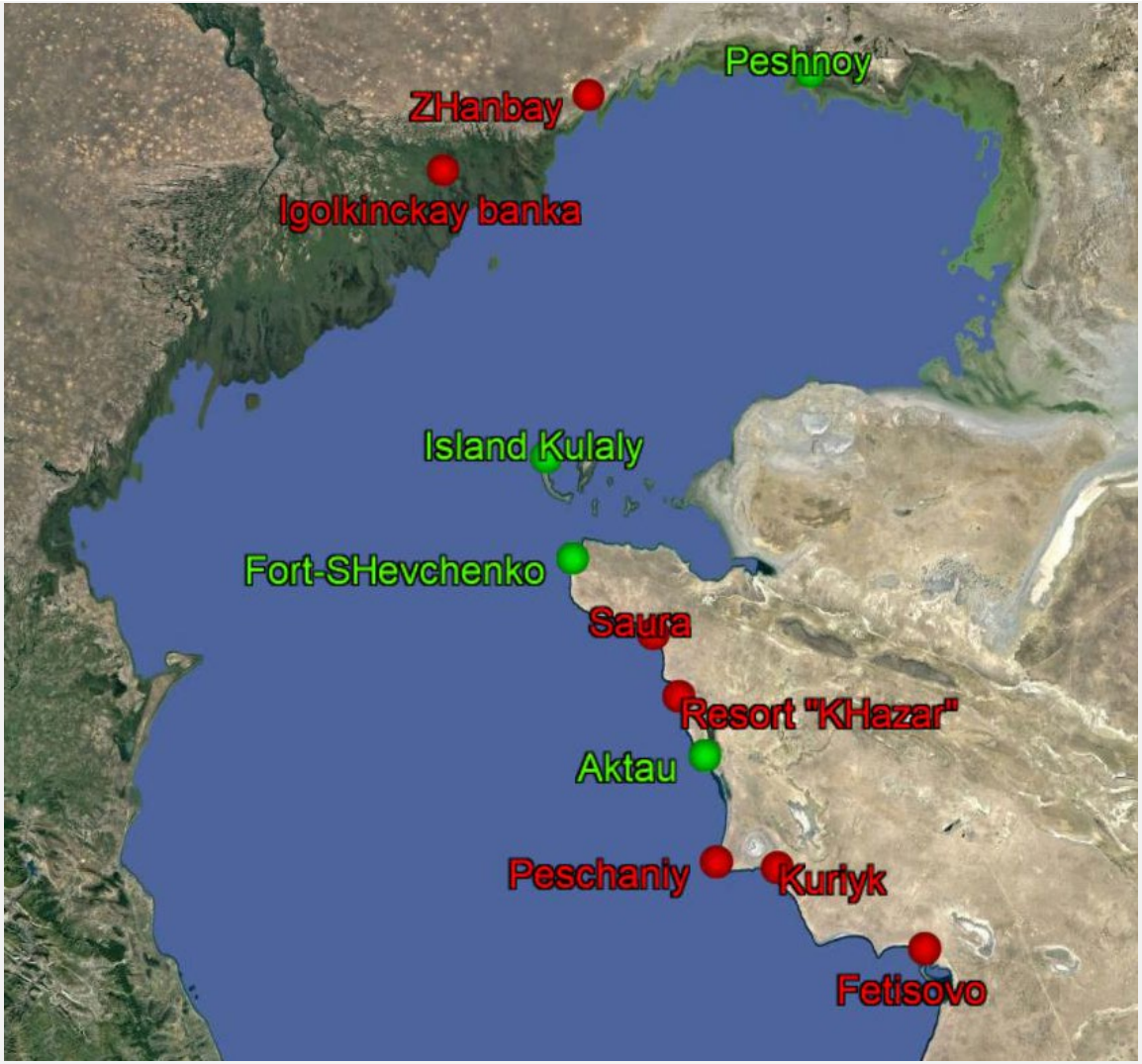
Ministry of Ecology, Geology and Natural Recourses of the Republic of Kazakhstan

Republic State Enterprise "Kazhydromet"

ACTIVITY OF NATIONAL HYDROMETEOROLOGICAL SERVICES OF THE KAZAKHSTAN IN THE CASPIAN SEA REGION 2018 - 2019

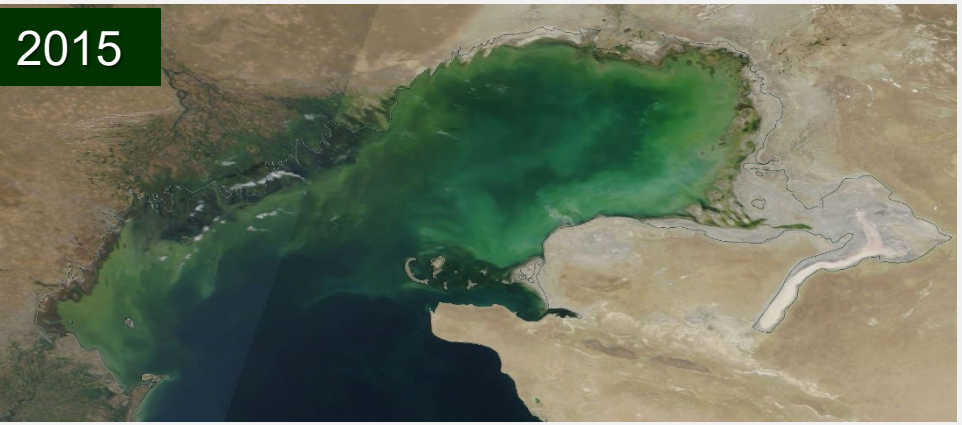
4-th (24) Session CASPCOM,
Teheran, 10-11 December 2019

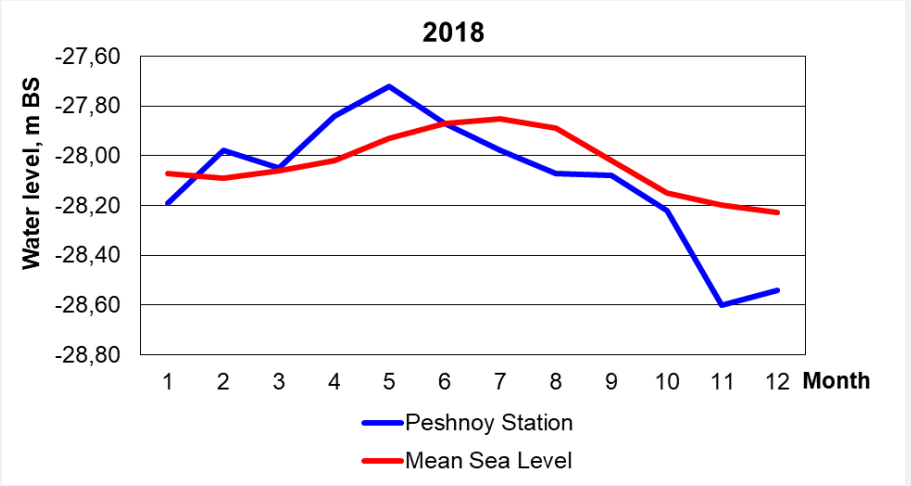
Hydrometeorological monitoring

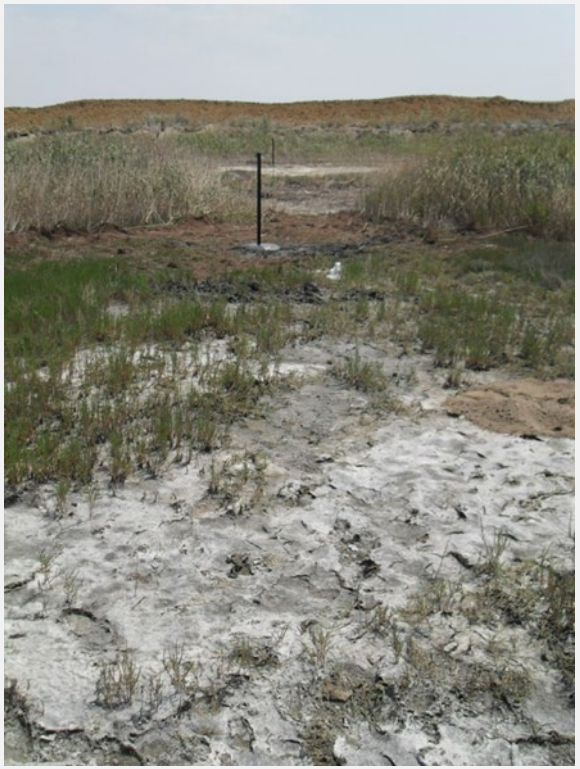


Marine observations at 4 marine hydrometeorological stations are made: Peshnoy, Island Kulaly, Fort -Shevchenko, Aktau and 6 marine hydrological posts: Zhanbay, Igolkinskay banka, Fetisovo, Kuriyk, Saura and Peschaniy.

Hydrometeorological monitoring





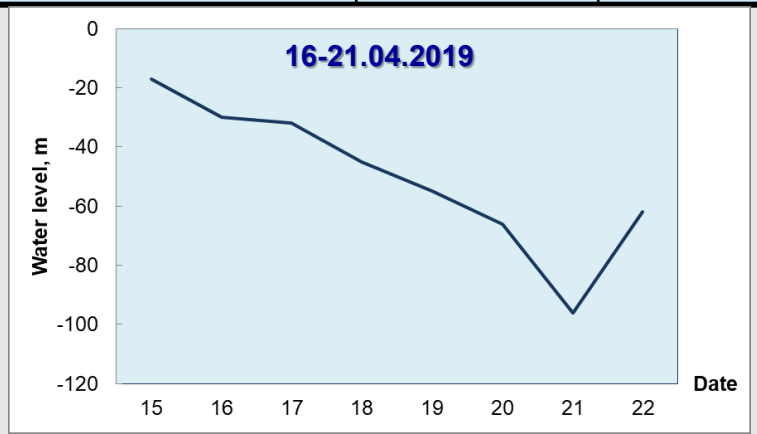


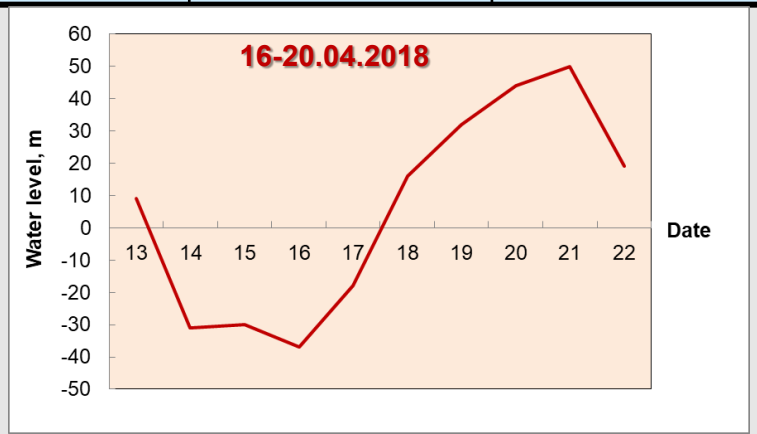
Hydrometeorological monitoring

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	+	+	+	+	+	+	+	+	+	+	+

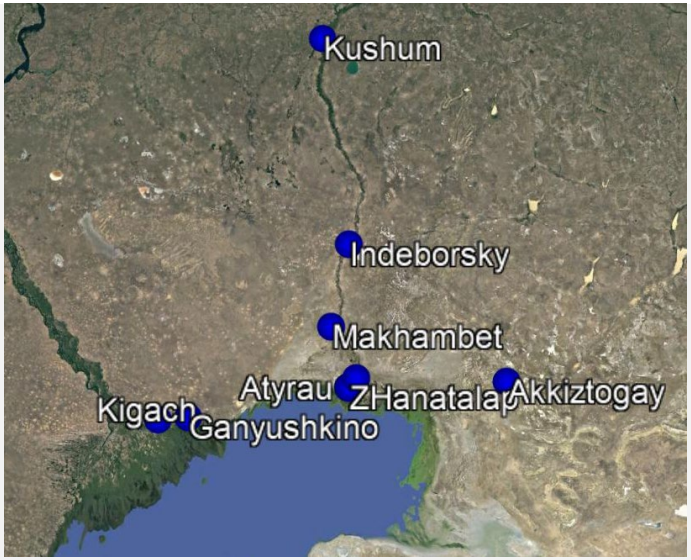
Storm surges on the Caspian Sea (2018 – first half 2019)

Point	2018		2019 (1-6)		Total
	Wind setup	Wind setdown	Wind setup	Wind setdown	
Zhambay	0	0	0	0	0
Peshnoy	25	26	26	15	92
Island Kulaly	1	2	0	0	3
Fort-Shevchenko	5	3	8	3	19
Saura	14	14	5	8	41
Peschany	0	0	0	0	0
Aktau	3	3	0	0	6
Fetisovo	1	5	0	3	9
Total	49	53	39	29	170

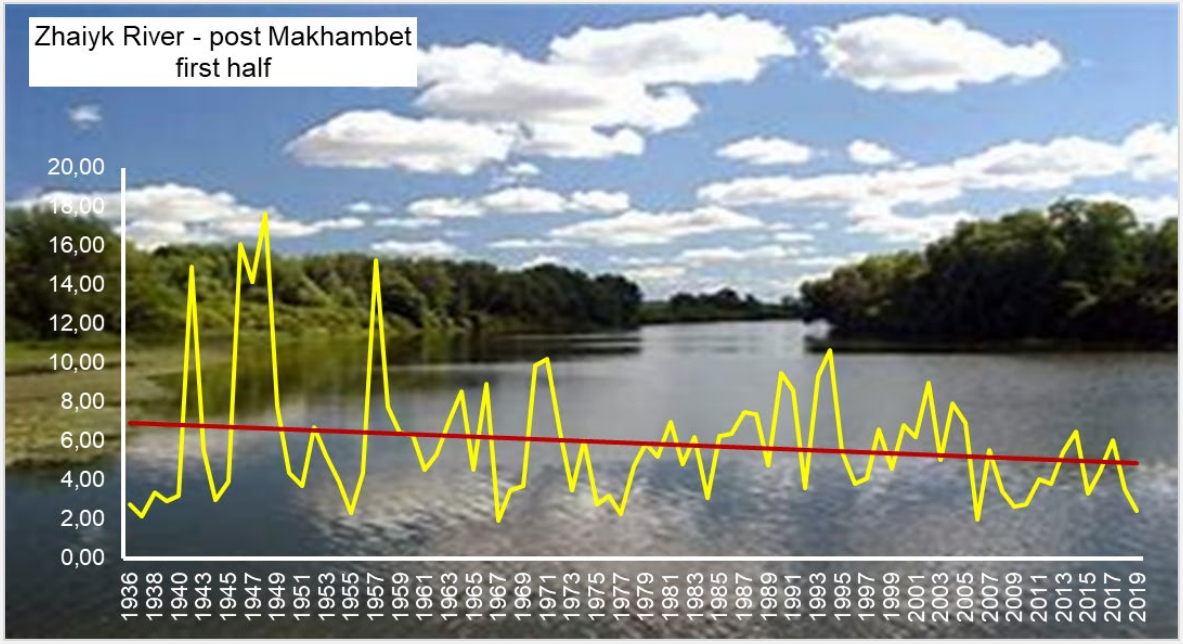


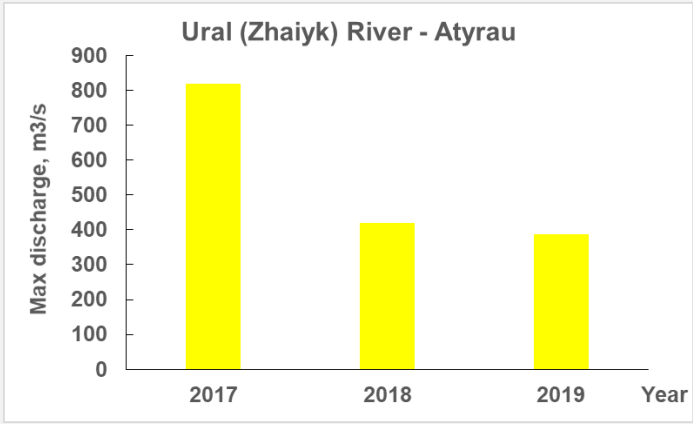


Hydrological monitoring



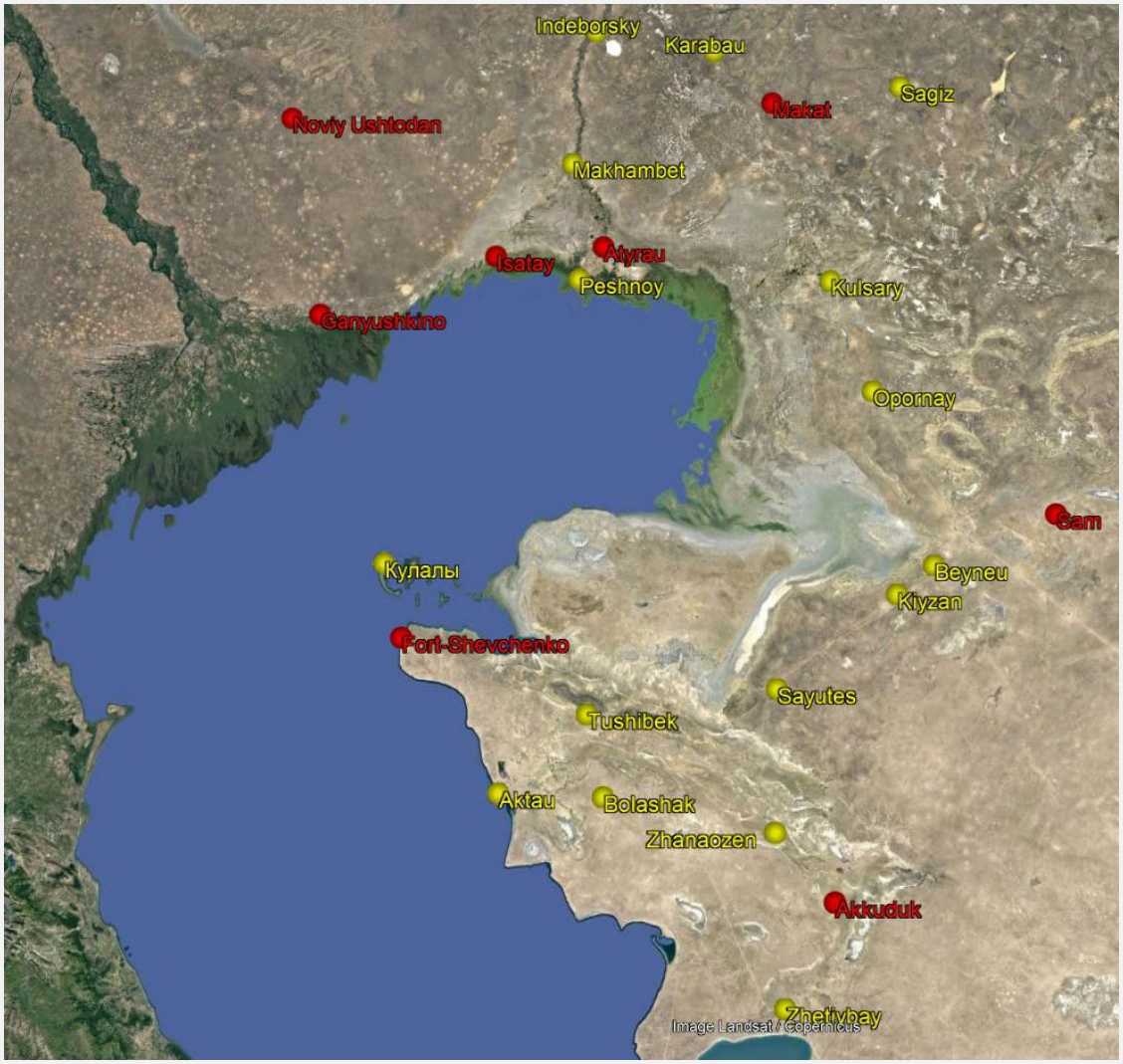
Hydrological network: Zhaiyk River – post Kushum, Zhaiyk River – post Indeborsky, Zhaiyk River – post Makhambet, Zhaiyk River – post Atyrau; Yaik Channel – post Erkenkala, Zolotoy rukav Channel – post Zhanatalap, Kigach Channel – post Kotyaevka, Sharonovka Channel – post Ganyushkino, Emba River – post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





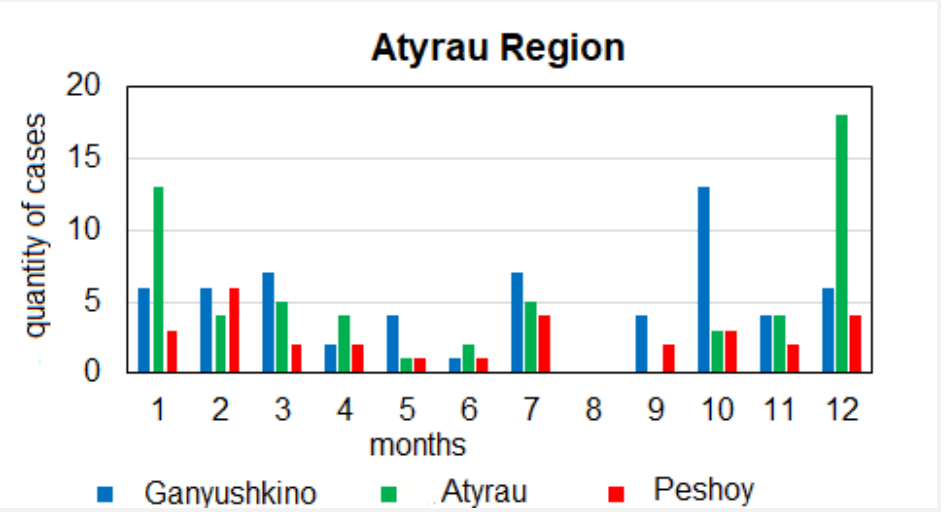
Meteorological monitoring

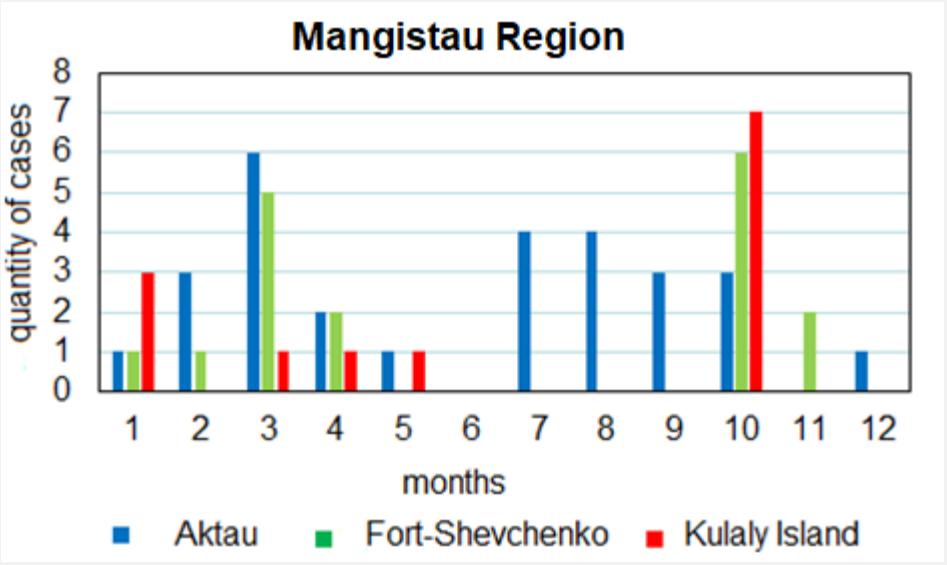
The meteorological network in the Caspian Region consists of 24 meteorological stations, 8 of which are stations of the international exchange (Atyrau, Noviy Ushtogan, Ganyushkino, Makat, Isatay, Sam, Fort- Shevchenko, Akkuduk).



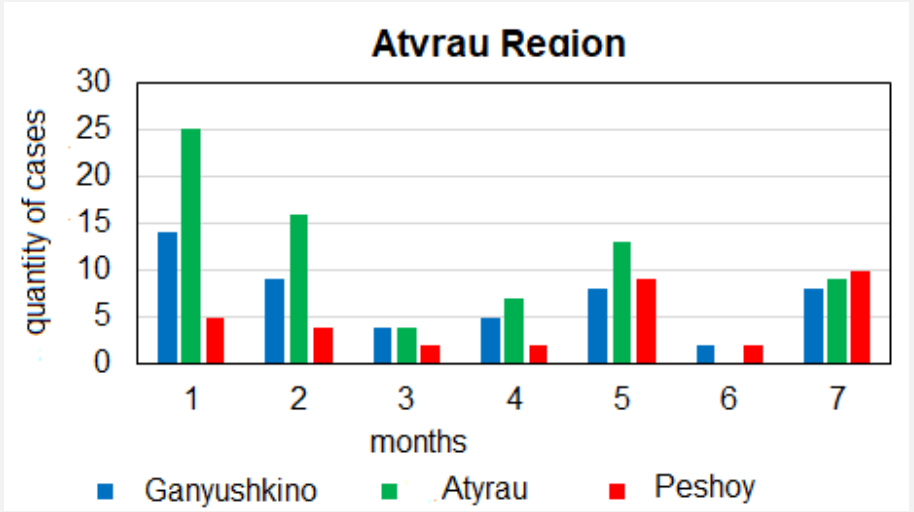
Frequency of a dangerous meteorological events (2018 - first half 2019)

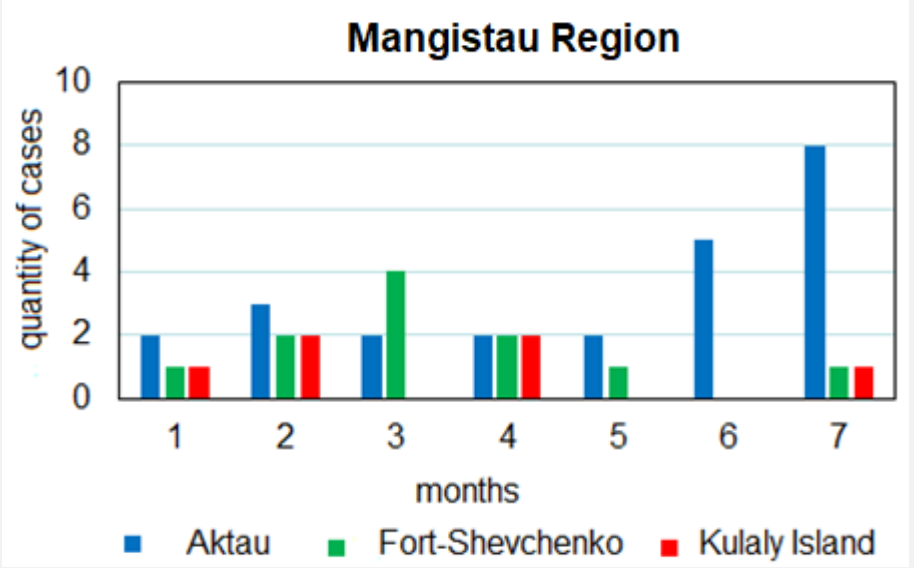
2018





2019



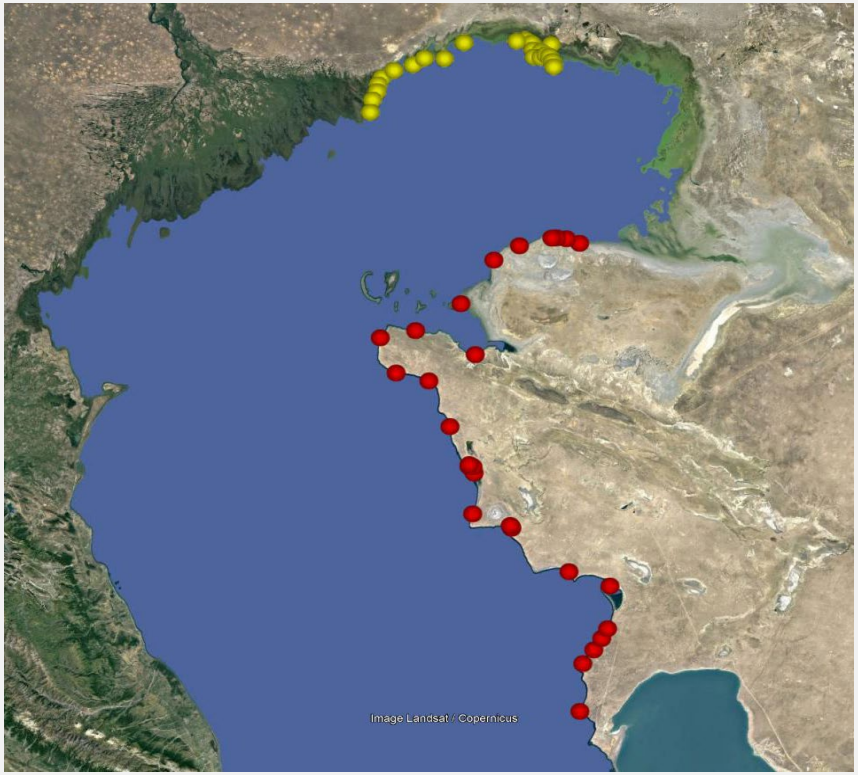


Sea water and sediment monitoring

Water quality monitoring is carried out at 50 points: 22 points in the Northern Caspian and 28 points in the Middle Caspian:

In the Atyrau Region, sea water is sampled at coastal stations of the Northern Caspian from May to October according to 45 indicators.

In the Mangistau Region sampling is carried out from February to November for 29 indicators.



In 2018 and the 1st half of 2019, no excess of the established sea water quality standards was found. According to the results of biotesting (determination of acute toxicity of water), the test water did not have a toxic effect on the test objects.

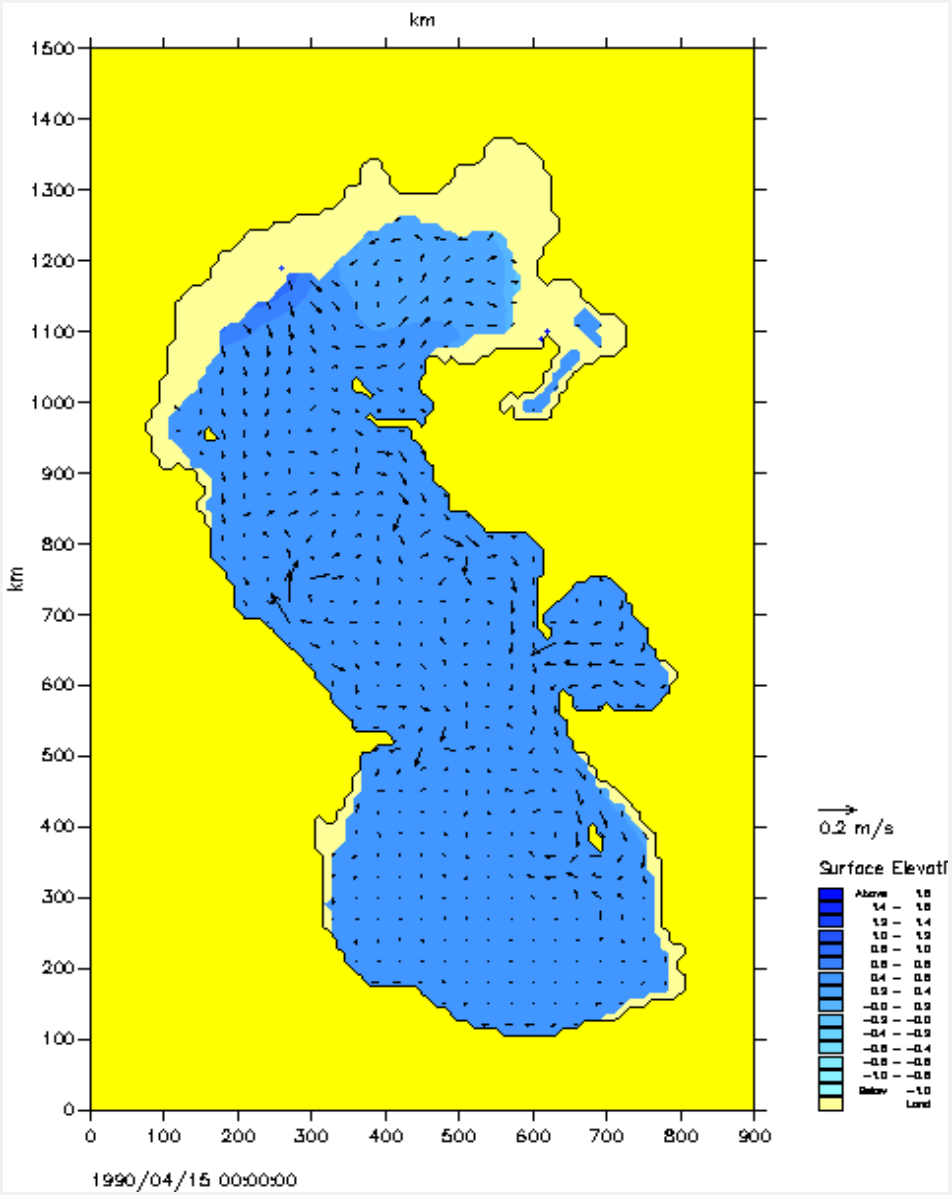
Bottom sediment monitoring is carried out 2 times per year (in spring and autumn) at 50 points. The following indicators are determined: the content of petroleum products, copper, chromium (6+), cadmium, nickel, manganese, lead, zinc.

Warming system of the storm surges on the Caspian Sea

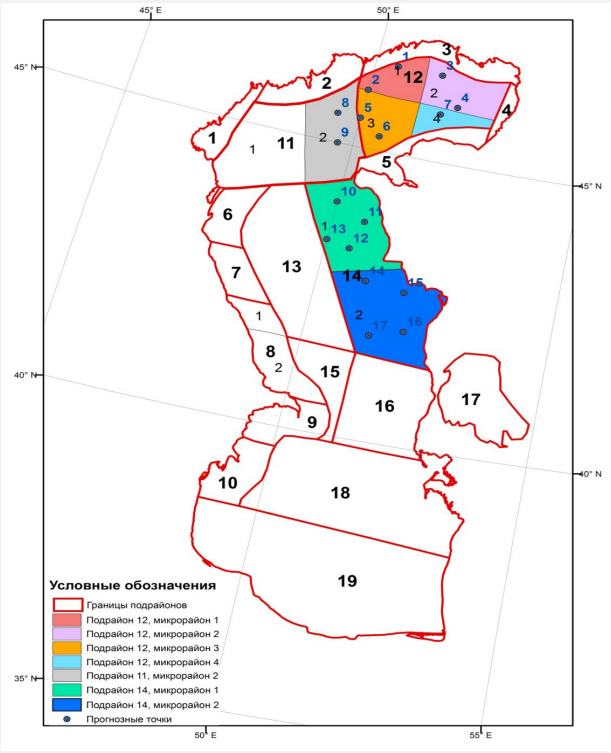
Information of Kazakhstan's stations and posts by e-mail 2 times per day

Information of ECMWF by ftp-channel

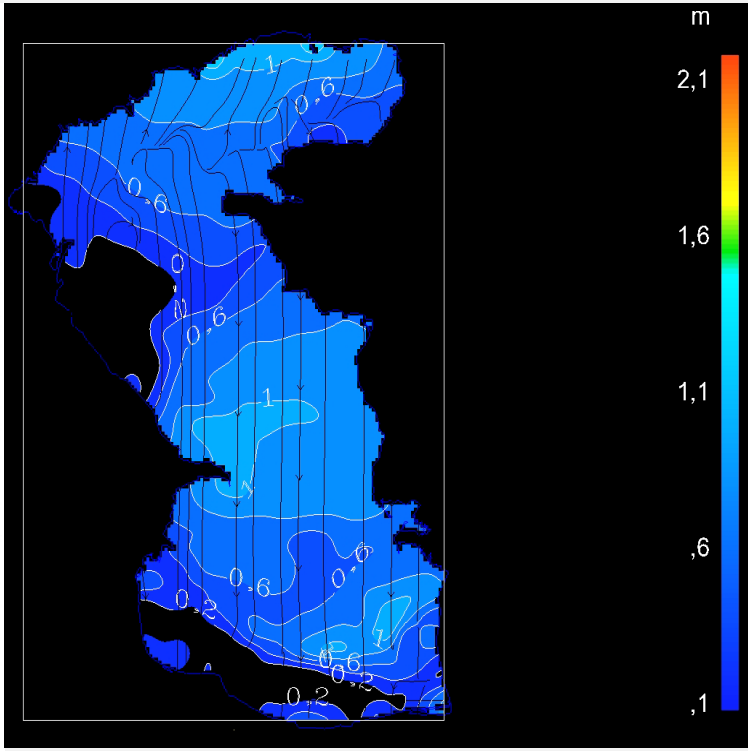
Advance time	PUV
0 hour (analysis)	
+6 hour	
+120 hour	

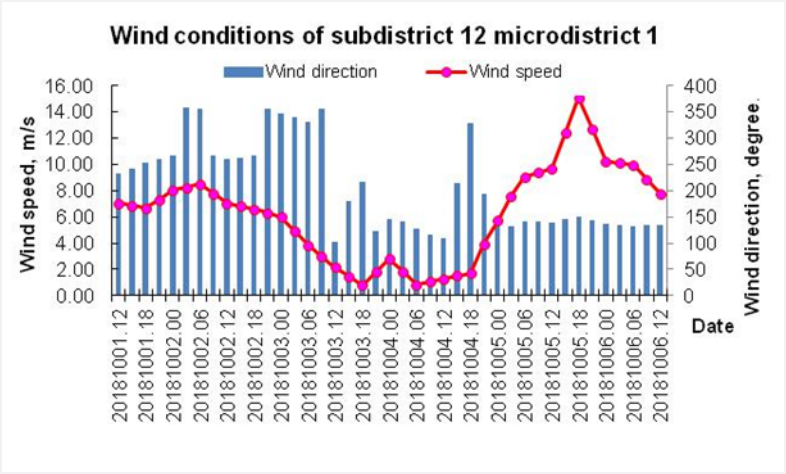


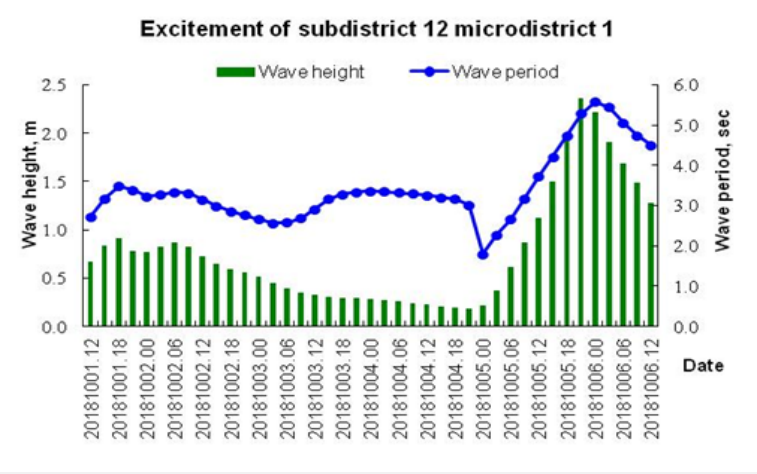
Scheme of the forecast with SWAN model



Date / time	subdistrict 12, microdistrict 1				
	Wave height	Wave direction	Wave period	Wind speed	Wind direction
	m	rumba	sec	m/s	rumba
20181001.12	0.67	ЮЗ	2.7	7.08	ЮЗ
20181001.15	0.83	ЮЗ	3.2	6.88	ЮЗ
20181001.18	0.91	ЮЗ	3.5	6.68	З
20181001.21	0.78	ЮЗ	3.4	7.36	З
20181002.00	0.77	Ю	3.2	8.04	З
20181002.03	0.82	Ю	3.3	8.26	С
20181002.06	0.87	Ю	3.3	8.49	С
20181002.09	0.83	Ю	3.3	7.76	З
20181002.12	0.73	Ю	3.1	7.03	З
20181002.15	0.65	Ю	3.0	6.82	З
20181002.18	0.60	Ю	2.9	6.61	З
20181002.21	0.56	Ю	2.8	6.31	С
20181003.00	0.51	Ю	2.7	6.01	С
20181003.03	0.45	Ю	2.6	4.92	С
20181003.06	0.39	ЮВ	2.6	3.83	СЗ
20181003.09	0.35	ЮВ	2.7	3.00	С
20181003.12	0.33	ЮВ	2.9	2.17	В
20181003.15	0.31	ЮВ	3.2	1.48	Ю
20181003.18	0.30	ЮВ	3.3	0.80	ЮЗ
20181003.21	0.29	ЮВ	3.3	1.81	ЮВ
20181004.00	0.28	ЮВ	3.4	2.82	ЮВ
20181004.03	0.27	В	3.4	1.82	ЮВ
20181004.06	0.26	ЮВ	3.3	0.82	ЮВ
20181004.09	0.24	ЮВ	3.3	1.07	ЮВ
20181004.12	0.23	ЮВ	3.3	1.32	В
20181004.15	0.21	ЮВ	3.2	1.52	ЮЗ
20181004.18	0.20	ЮВ	3.2	1.72	СЗ
20181004.21	0.18	ЮВ	3.0	3.92	Ю
20181005.00	0.21	С	1.8	5.72	ЮВ
20181005.03	0.37	СЗ	2.3	7.59	ЮВ
20181005.06	0.61	СЗ	2.7	9.07	ЮВ
20181005.09	0.87	СЗ	3.2	9.37	ЮВ
20181005.12	1.13	СЗ	3.7	9.68	ЮВ
20181005.15	1.50	СЗ	4.2	12.40	ЮВ
20181005.18	1.99	СЗ	4.7	15.12	ЮВ
20181005.21	2.36	СЗ	5.3	12.67	ЮВ
20181006.00	2.22	СЗ	5.6	10.22	ЮВ
20181006.03	1.91	СЗ	5.4	10.11	ЮВ
20181006.06	1.69	СЗ	5.1	10.00	ЮВ
20181006.09	1.49	СЗ	4.7	8.89	ЮВ
20181006.12	1.27	СЗ	4.5	7.78	ЮВ

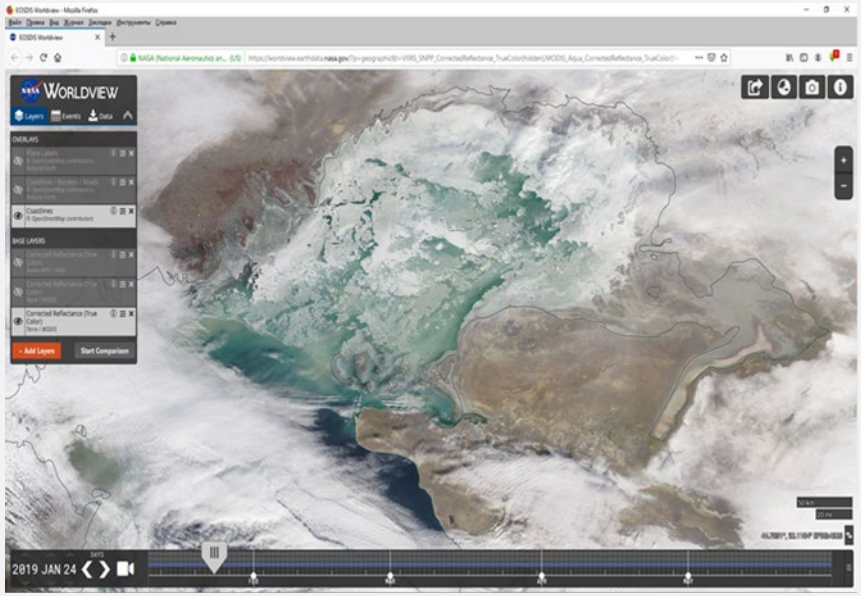






Ice Monitoring

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



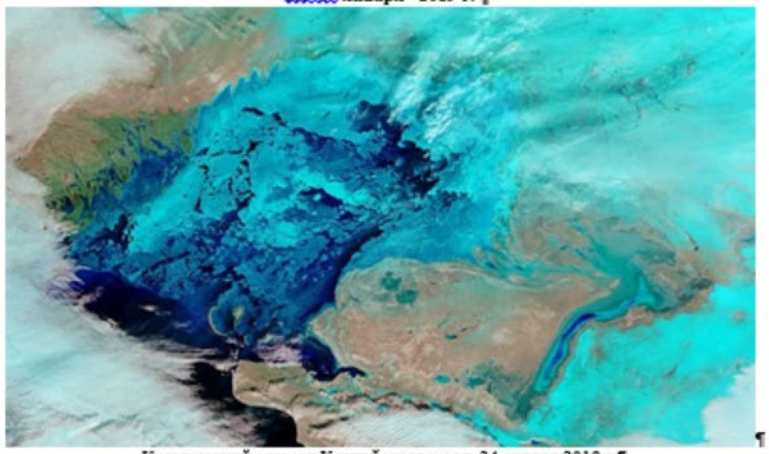
The analysis of instrumental observations of water temperature, ice thickness and height of snow on ice.

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 29 января 2019 г.



Космический снимок Каспийского моря, 24 января 2019 г.
«MODIS Rapid Response Project at NAGA/GSFC»

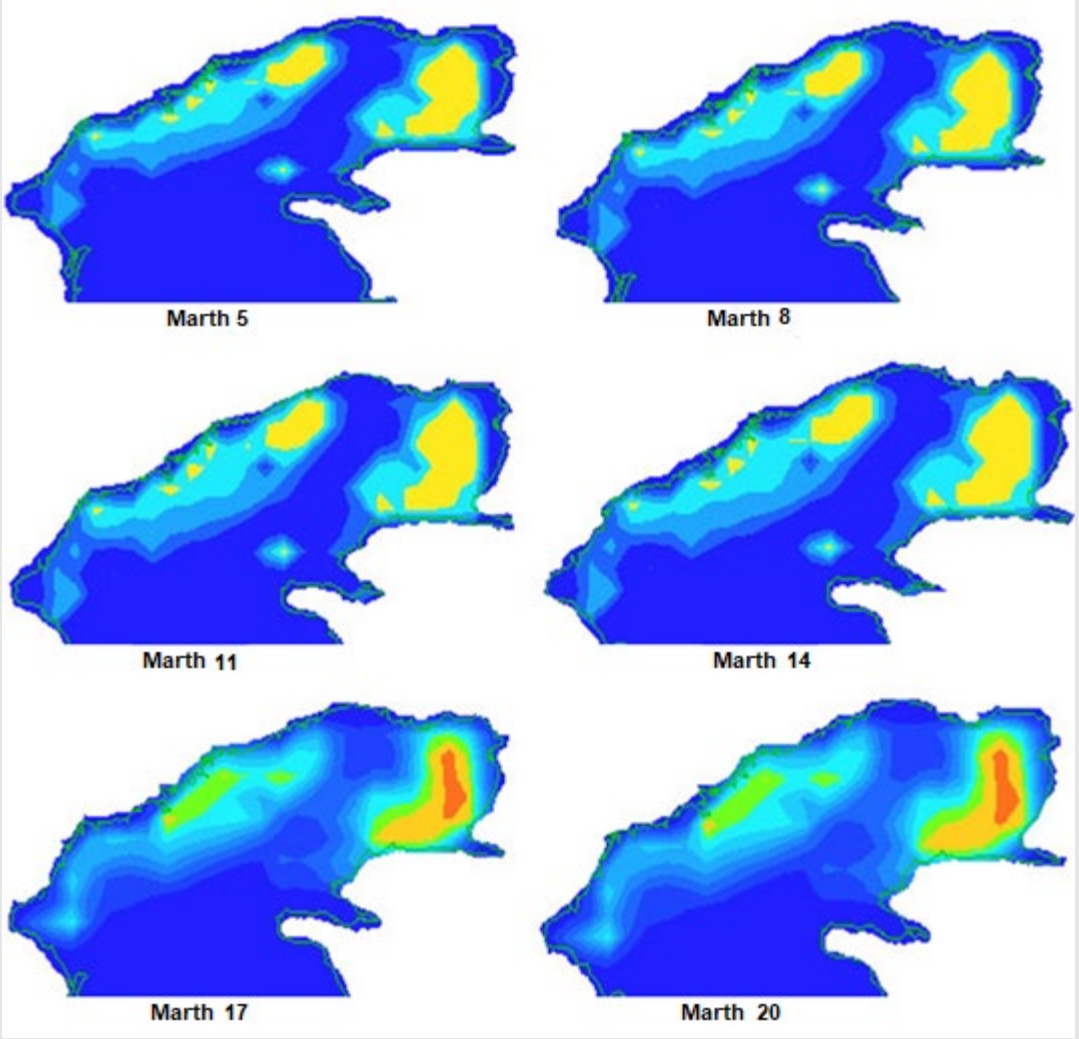
Таблица – Основные элементы ледового режима Каспийского моря на 29.01.2019 г. по оперативным данным морских станций и постов

Пункт	Ширина припая, км	Толщина льда, см	Высота снега на льду, см	Количество неподвижного льда, баллы	Количество чистой воды, баллы	Дрейф льда, баллы	Сплочённость льда, баллы
Морские станции и посты Казгидромета							
МГП: Жанбай	0,2	26		9			
М Пешной	>0,1	19		10	0	8	
МГП Иголкинская банка	>0,1	4		10			
МГ Кулалы, остров	>0,1				5	5	
МГП Лагань	>0,1			9		8	

сс – сведений нет
нн – 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.

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

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 5970 km, of which 2,220 km is Kazakhstan.

The region of the Caspian Sea adjacent to the shores of Kazakhstan, according to natural conditions, is divided into two parts: the eastern part of the Northern Caspian and the eastern part of the Middle Caspian. The eastern part of the Northern Caspian is shallow with a low coast and low inclines of the bottom. Here the average depth is 2 m, and the maximum depth, in the region of the Ural Furrow, is 8 ... 10 m. The relief of the bottom is complicated by the presence of cans, islands, furrows. It is a semi-enclosed reservoir, a hydrological regime, which is formed in the conditions of the continental and rivers 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 the middle is deep-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 region, including Kazakhstan. This unique reservoir with a diverse flora of fauna and hydrocarbon reserves. Socio-economic development in the coastal zone has a significant impact on the hydrometeorological regime. The level of the Caspian Sea varies considerably during the year

The Caspian Sea hydrometeorological research Department

Caspian sea water surface status review
Caspian sea hydrometeorological research
Caspian sea ecological research

Caspian Sea Water Surface, 07-13 November, 2019

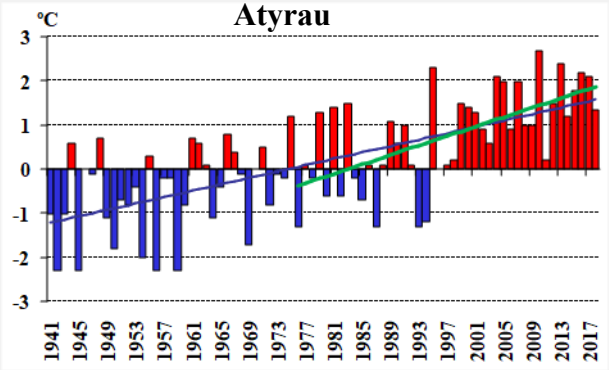
In the Caspian Sea Northern Part the mean sea level corresponded to mark minus 28,18 m, maximal – minus 27,94 m, minimal – minus 28,40 m (using observational data from the Kazakhstan's sea stations and posts: Peshnoy, Zhanbay, Kulaly Island and Roshydromet's sea station – Tuyleny Island).

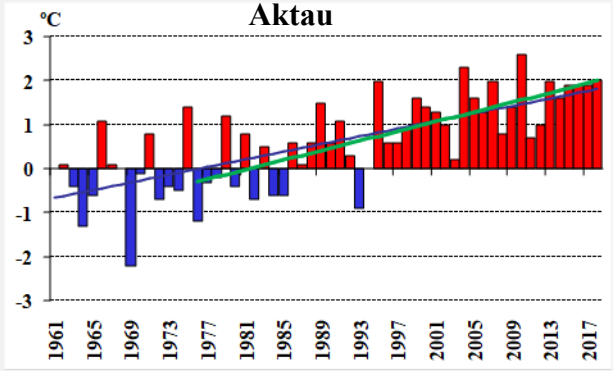
In the Caspian Sea Middle Part the mean sea level corresponded to mark minus 28,24 m, maximal – minus 28,01 m, minimal – minus 28,77 m (using observational data from the Kazakhstan's sea stations and posts: Fort-Shevchenko, Aktau, Fetisovo and Roshydromet's sea station - Makhachkala).

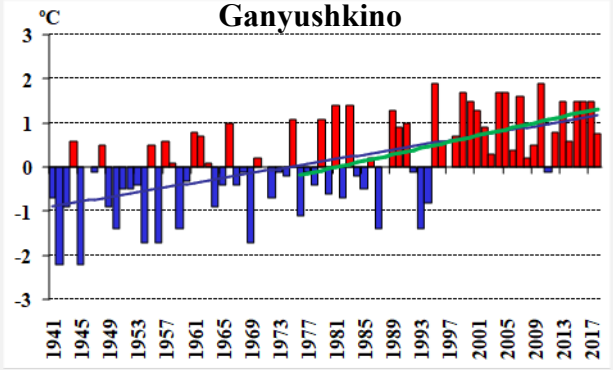
Space image of the Caspian Sea. 2019, 14 November, NAGA/GSFC

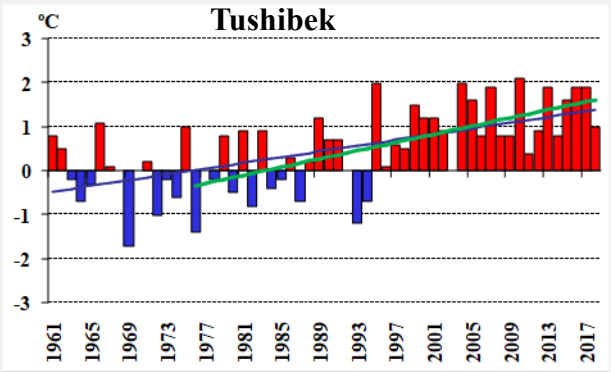
ANNUAL BULLETIN OF MONITORING OVER CLIMATE STATE AND CLIMATE CHANGE IN THE CASPIAN REGION

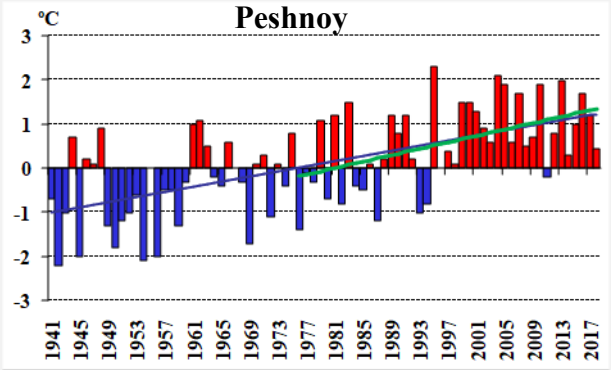
The time course and linear trend of anomalies in average annual air temperature according to meteorological stations in the Kazakhstan part of the Caspian Region

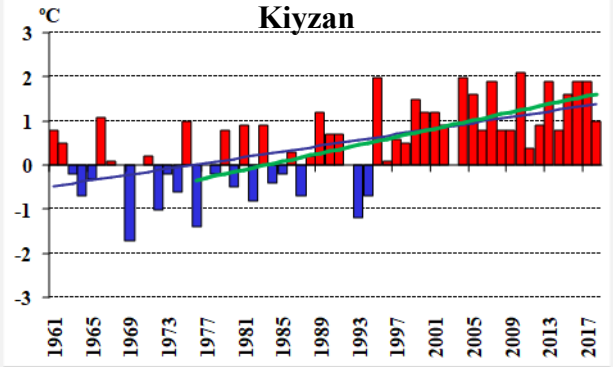


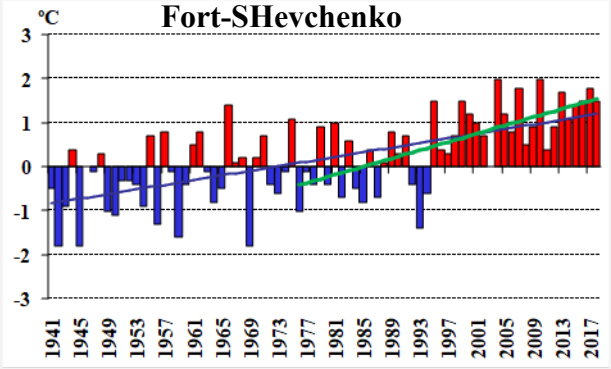


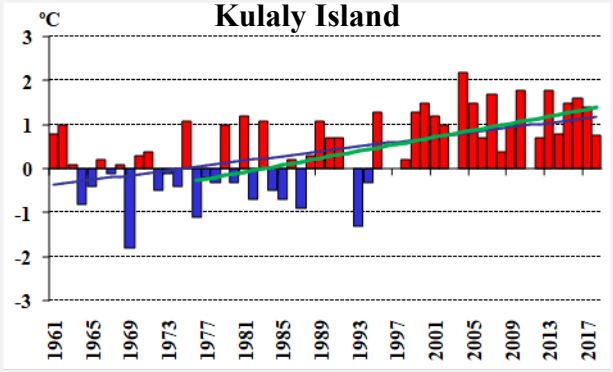






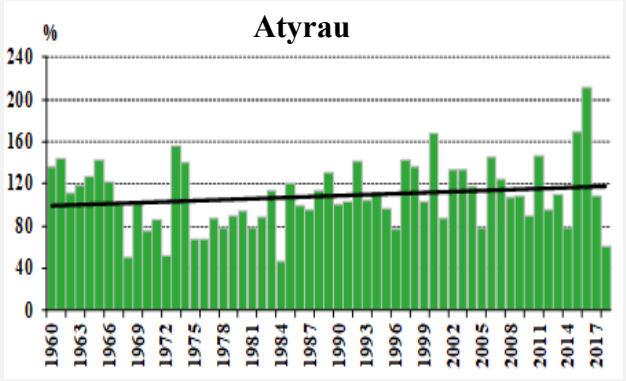


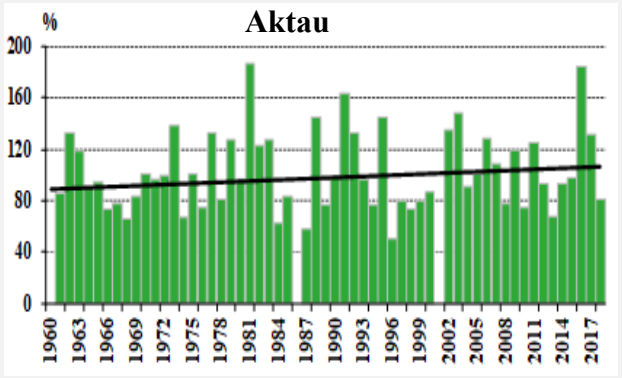


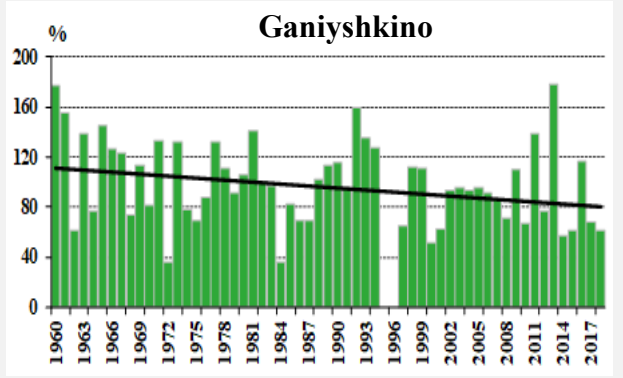


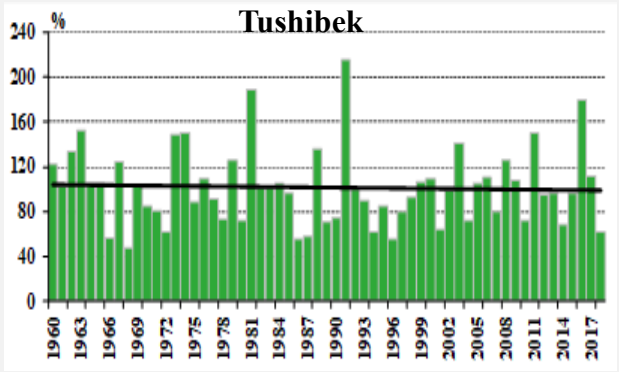
ANNUAL BULLETIN OF MONITORING OVER CLIMATE STATE AND CLIMATE CHANGE IN THE CASPIAN REGION

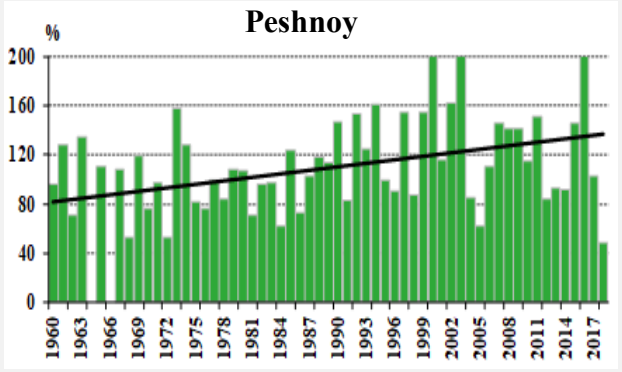
The time course and linear trend of precipitation (in% of norm) according to meteorological stations of the Kazakhstan part of the Caspian Region

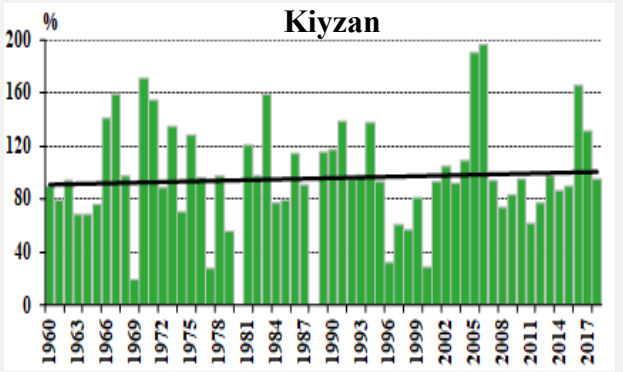


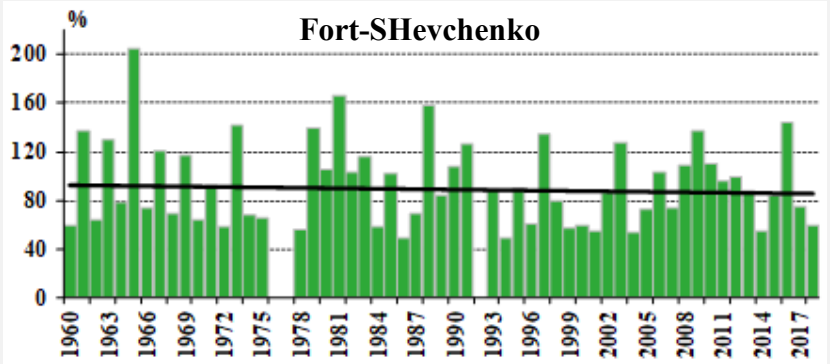













A lot of thanks
for attention!