

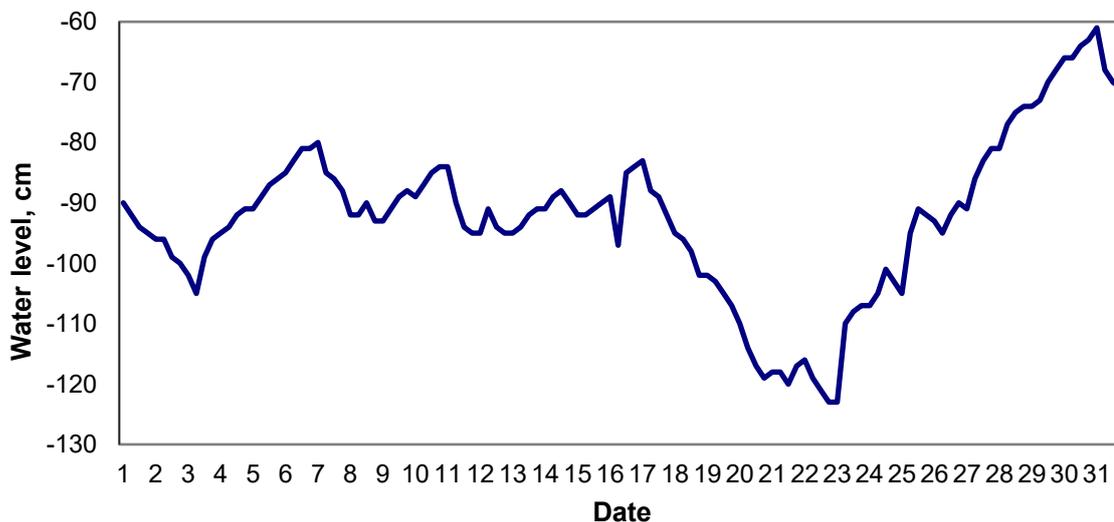


MINISTRY OF ECOLOGY AND NATURAL RESOURCES
OF THE REPUBLIC OF KAZAKHSTAN
RSE «KAZHYDROMET»

RESEARCH CENTER

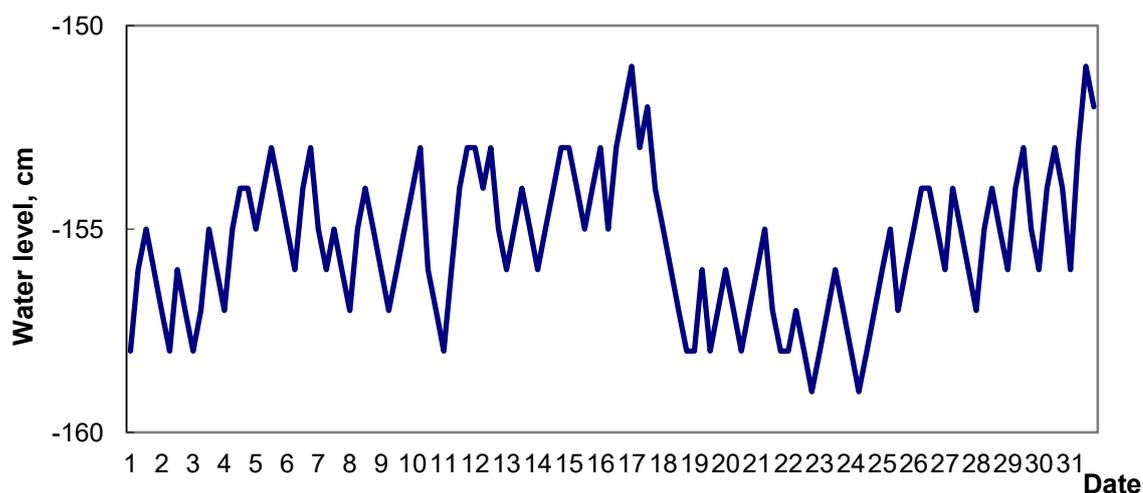
OVERVIEW OF UP SURGE AND DOWN SURGE EVENTS
in March 2025

Peshnoy



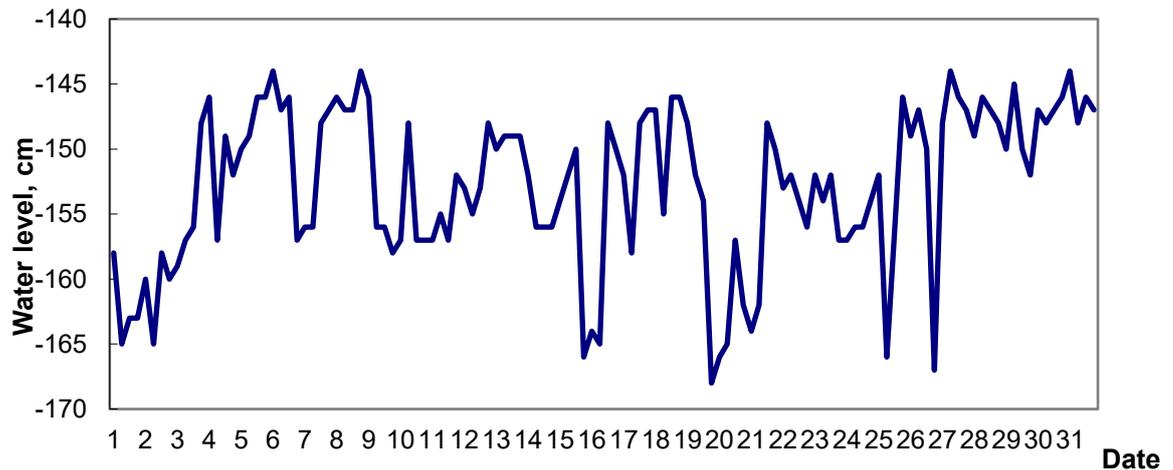
From March 23 to March 31, a rise in sea level was observed at Peshnoy, increasing from -29.23 m BS to -28.71 m BS due to the water level rise in the Zhaiyk River near Atyrau.

Kulaly, island



The runup and surge level fluctuations did not exceed 14 cm. The sea level change during the month varied from minus 29.59 m BS to minus 29.51 m BS.

Fort-Shevchenko



Date	Level rise, cm	Level fall, cm	Prevailing wind direction, rhumb	Maximum wind speed, m/s
15.03		16	north, southeast	2
18-19.03		22	northwest	6
21.03	16		northeast	7
25.03	20		north-northwest	6
26.03		17	west	2

- On 15 March, a sea level drop by 16 cm was observed from minus 29.5 m BS to minus 29.66 m BS. The wind speed reached 2 m/s, predominantly from the north and southeast directions;

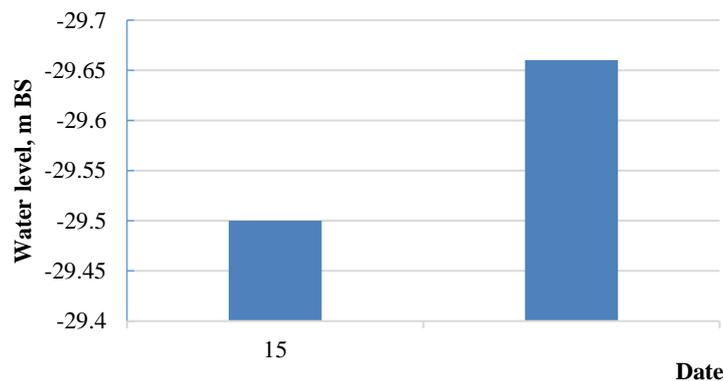


Figure. Graph of sea level changes in Fort-Shevchenko on March 15, 2025.

- On 18-19 March, a sea level drop by 22 cm was observed from minus 29.46 m BS to minus 29.68 m BS. The wind speed reached 6 m/s, predominantly from the northwest;

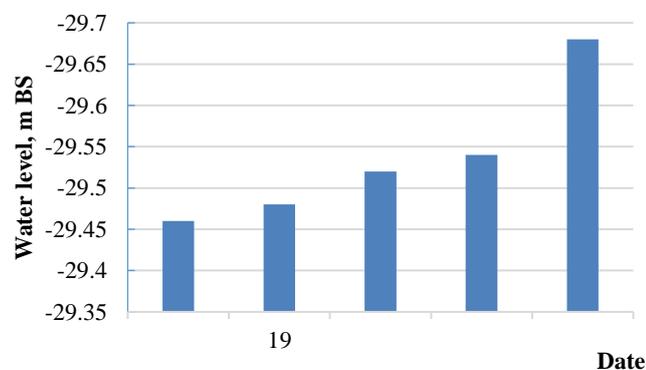


Figure. Graph of sea level changes in Fort-Shevchenko on March 18-19, 2025.

- On 21 March, a sea level rose by 16 cm was observed from minus 29.64 m BS to minus 29.48 m BS. The wind speed reached 7 m/s, predominantly from the northeast;

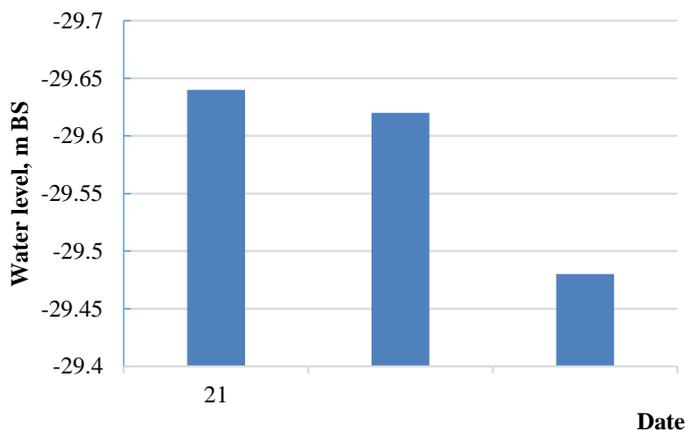


Figure. Graph of sea level changes in Fort-Shevchenko on March 21, 2025.

- On 25 March, a sea level rose by 20 cm was observed from minus 29.66 m BS to minus 29.46 m BS. The wind speed reached 6 m/s, predominantly from the north-northwest;

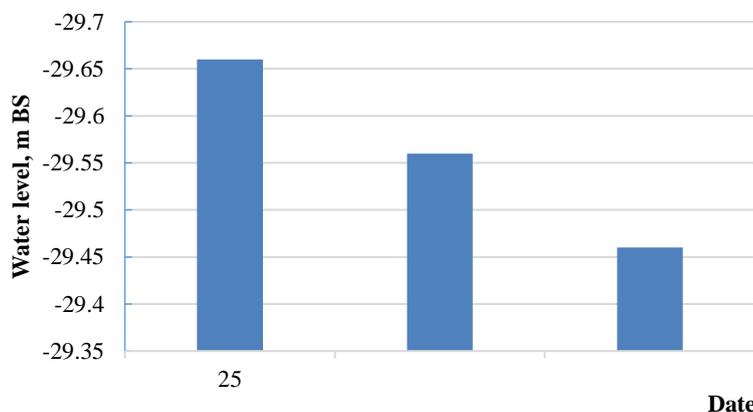


Figure. Graph of sea level changes in Fort-Shevchenko on March 25, 2025.

- On 26 March, a sea level drop by 17 cm was observed from minus 29.5 m BS to minus 29.67 m BS. The wind speed reached 2 m/s, predominantly from the west direction;

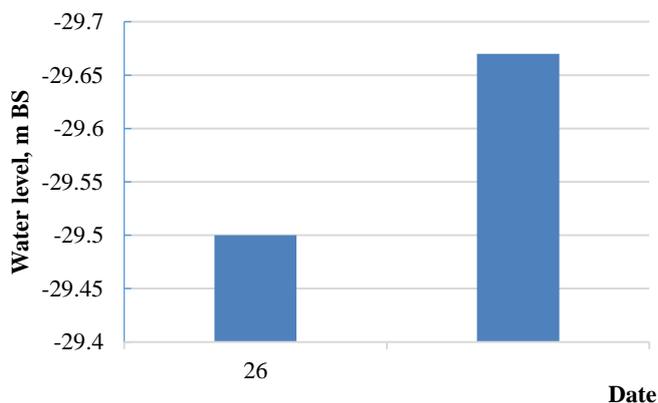
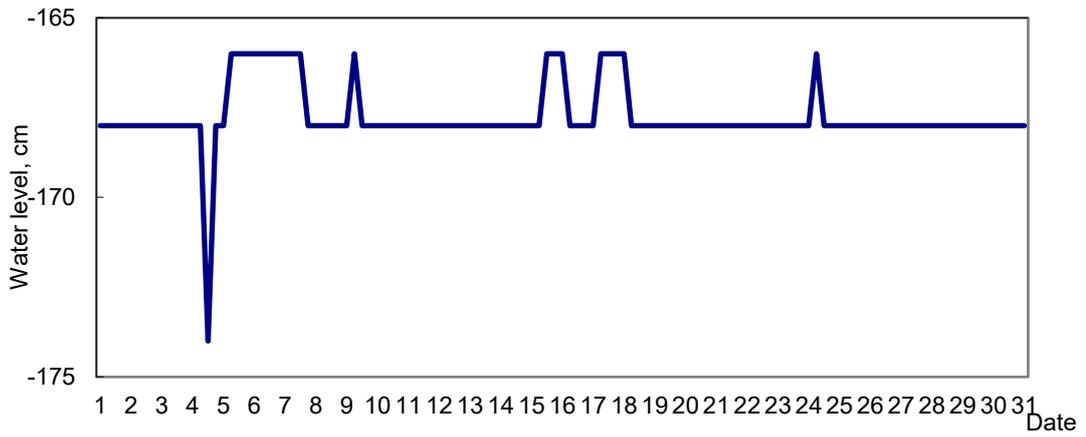


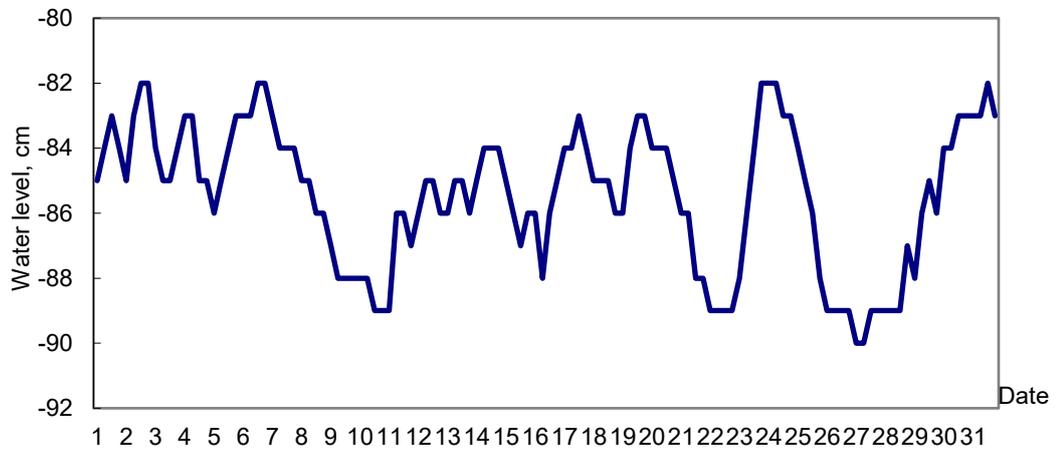
Figure. Graph of sea level changes in Fort-Shevchenko on March 26, 2025.

Saura



The runup and surge level fluctuations did not exceed 14 cm. The sea level change during the month fluctuated from minus 29.74 m BS to minus 29.66 m BS.

Peschany



The runup and surge level fluctuations did not exceed 14 cm. The sea level change during the month fluctuated from minus 28.90 m BS to minus 28.82 m BS.

Aktau



Date	Level rise, cm	Level fall, cm	Prevailing wind direction, rhumb	Maximum wind speed, m/s
05.03	29		south, south-southwest	5
26.03	20		west	3

- On 05 March, a sea level rose by 29 cm was observed from minus 29.60 m BS to minus 29.31 m BS. The wind speed reached 5 m/s, predominantly from the south direction;

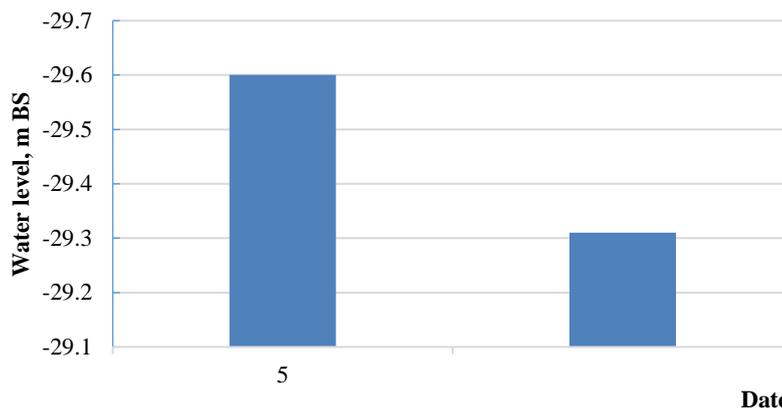


Figure. Graph of sea level changes in Aktau on March 05, 2025.

- On 26 March, a sea level rose by 20 cm was observed from minus 29.68 m BS to minus 29.48 m BS. The wind speed reached 3 m/s, predominantly from the west direction;

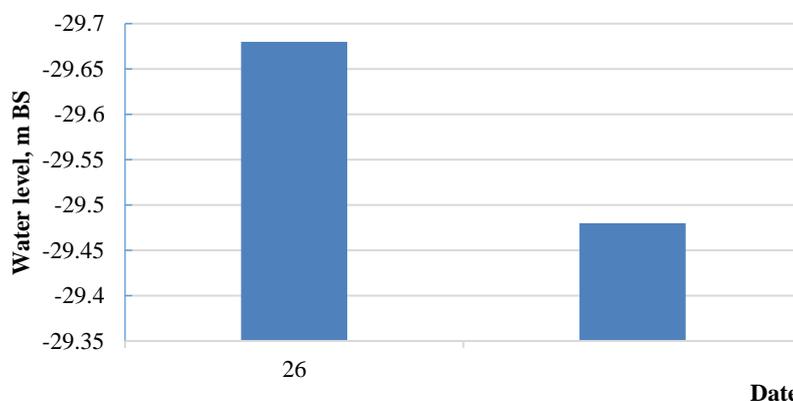
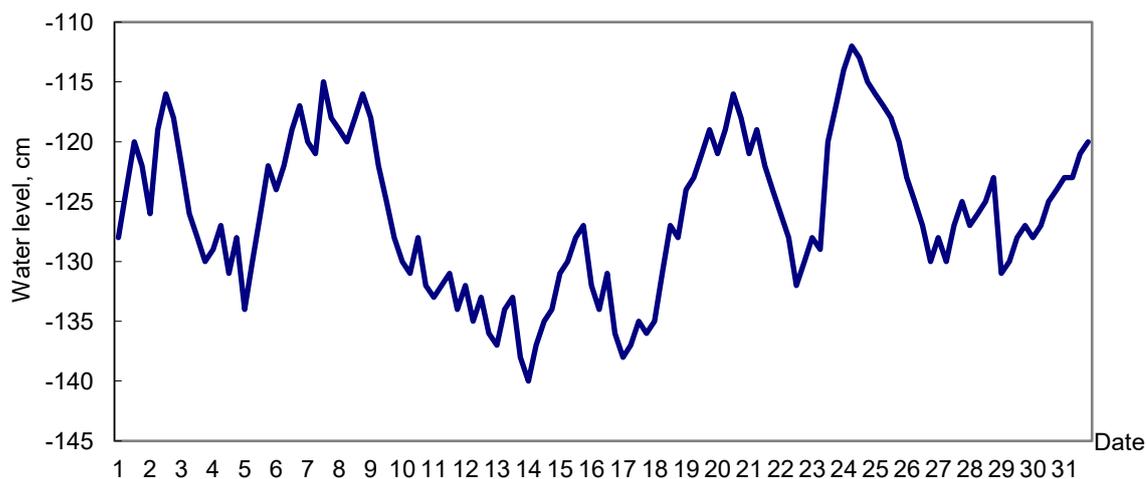


Figure. Graph of sea level changes in Aktau on March 26, 2025.

Fetisovo



Date	Level rise, cm	Level fall, cm	Prevailing wind direction, rhumb	Maximum wind speed, m/s
08-10.03		15	east	7
24-26.03		18	north, northeast	11

- On 08-10 March, a sea level drope by 15 cm was observed from minus 29.16 m BS to minus 29.31 m BS. The wind speed reached 7 m/s, predominantly east direction;

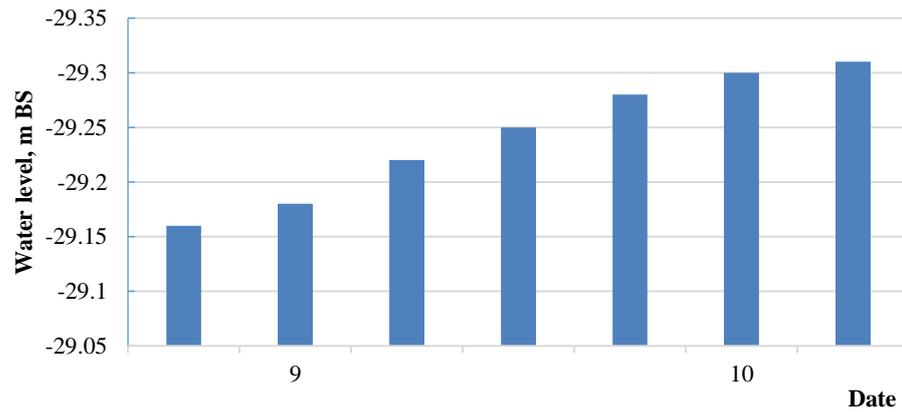


Figure. Graph of sea level changes in Fetisovo on March 08-10, 2025.

- On 24-26 March, a sea level drope by 18 cm was observed from minus 29.12 m BS to minus 29.30 m BS. The wind speed reached 11 m/s, predominantly north, northeast direction;

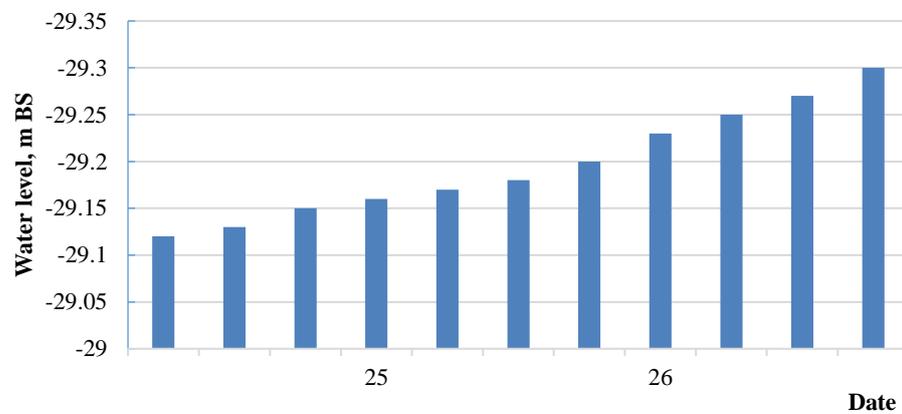


Figure. Graph of sea level changes in Fetisovo on March 24-26, 2025.

Note:

Analysis of the Zhanbay upsurge and downsurge events was not performed due to the receipt of hydrometeorological data with gaps.

STORM SURGE HAZARD CRITERIA FOR THE NORTHEASTERN COASTLINE

	Rise/Fall, cm	Characteristic***	Consequences
Up surge	50	Critical	Flooded coast area to 5 km
	65	Danger	Flooding and flooding of dams and buildings up to 10 km
	110	Especially danger	Flooding of the coast for more than 10 km, destruction of dams and buildings
Down surge	-50	Critical	worsening navigation conditions for small ships
	-65	Danger	Worsening of navigation conditions for small and medium-sized ships
	-100	Especially danger	Ships would be aground

* The calculated characteristics were obtained using the hydrodynamic module of the MIKE 21 Flow Model, adapted in RSE "Kazhydromet" to the conditions of the Caspian Sea. Data of sea level measurements and pressure field numerical forecasting for 24 –120 hours were used in computation.

** At definition of characteristic marks local conditions were considered.

*** Critical – 50 % frequency, danger – 25 % frequency, especially danger– 2 % frequency. The calculation was carried out for the period 1940-2020 according to the data of Peshnoy station.
BS – Baltic System

The bulletin was compiled by the Department of Hydrometeorological Research of the Caspian Sea

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