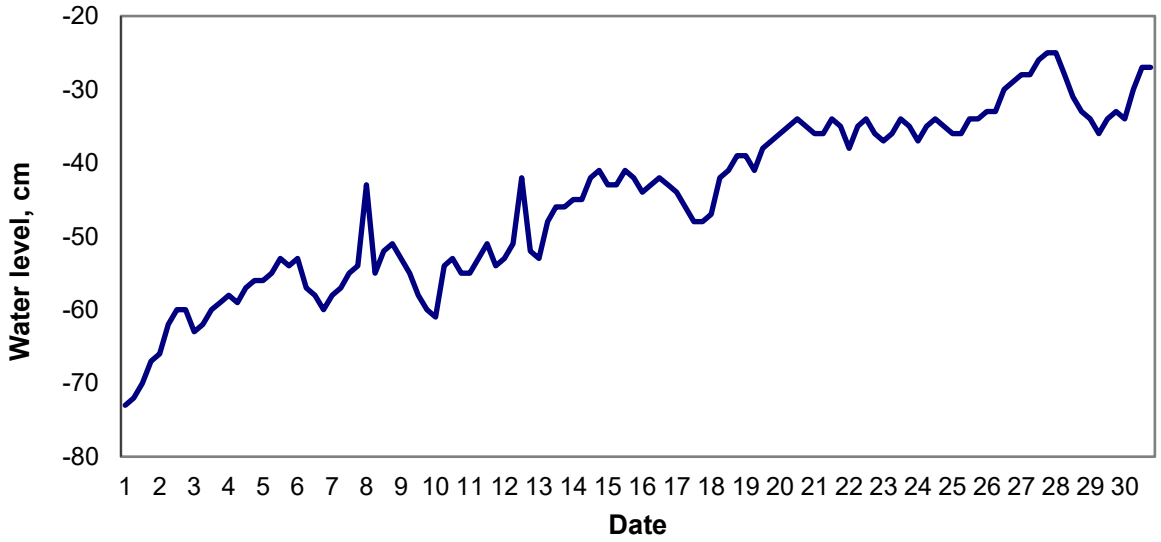
MINISTRY OF ECOLOGY AND NATURAL RESOURCES OF THE REPUBLIC OF KAZAKHSTAN
RSE «KAZHYDROMET»

RESEARCH CENTER

OVERVIEW OF UP SURGE AND DOWN SURGE EVENTS in April 2025

Peshnoy



In April, a rise in sea level was observed at Peshnoy, increasing from -28.73 m BS to -28.25 m BS due to the water level rise in the Zhaiyk River near Atyrau.

Date	Level rise, cm	Level fall, cm	Prevailing wind direction, rhumb	Maximum wind speed, m/s
06-08.04	17		north, west	8

-On 06-08 April, a sea level rose by 17 cm was observed from minus 29.60 m BS to minus 29.43 m BS. The wind speed reached 8 m/s, predominantly from the northwest.

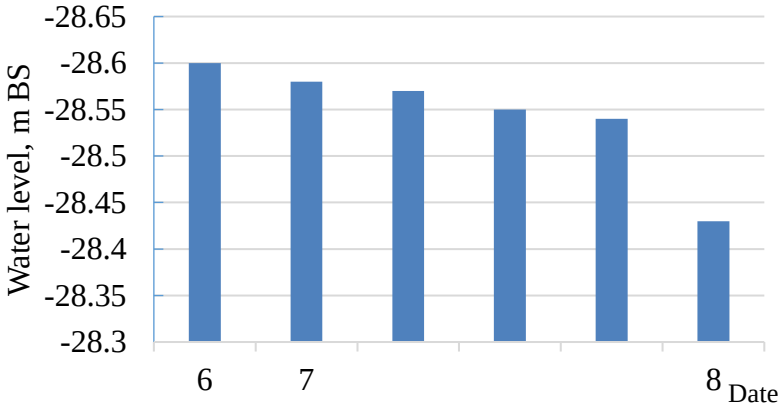
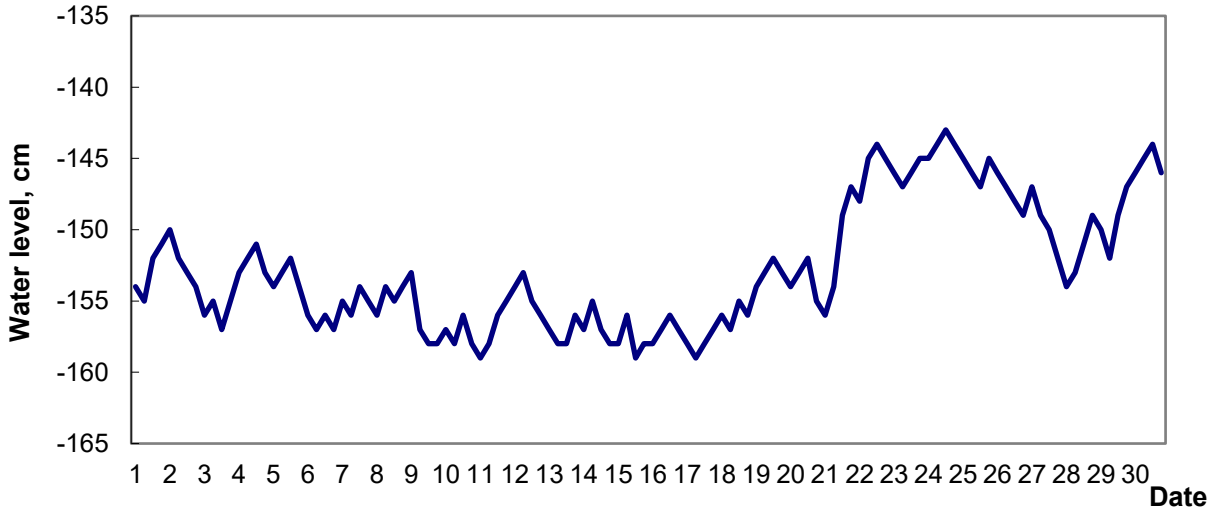


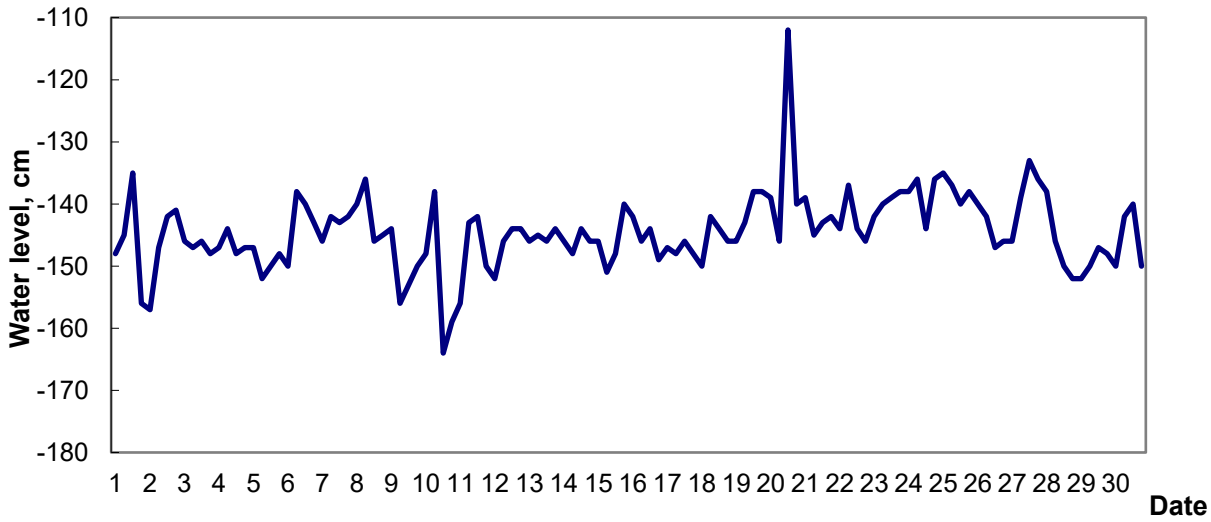
Figure. Graph of sea level changes in Peshnoy on April 06-08, 2025.

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 29.43 m BS.

Fort-Shevchenko



Date	Level rise, cm	Level fall, cm	Prevailing wind direction, rhumb	Maximum wind speed, m/s
01-02.04		22	west, southwest	5
10.04		26	north-northwest	7
20.04	34		southeast	6
27-28.04		19	northwest	8

- On 01-02 April, a sea level drop by 22 cm was observed from minus 29.35 m BS to minus 29.57 m BS. The wind speed reached 5 m/s, predominantly from the west and southwest directions;

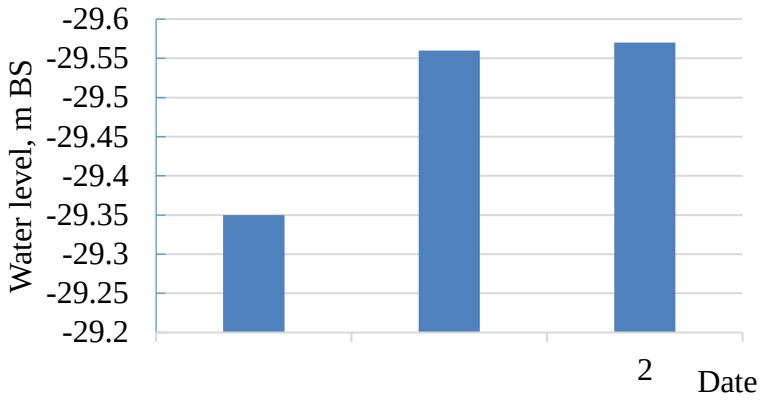


Figure. Graph of sea level changes in Fort-Shevchenko on April 01-02, 2025.

- On 10 April, a sea level drop by 26 cm was observed from minus 29.38 m BS to minus 29.64 m BS. The wind speed reached 7 m/s, predominantly from the north-northwest;

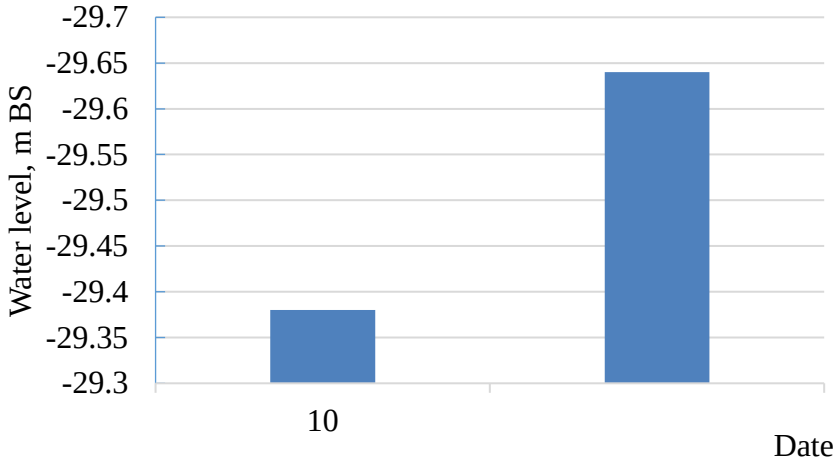


Figure. Graph of sea level changes in Fort-Shevchenko on April 10, 2025.

- On 20 April, a sea level rose by 34 cm was observed from minus 29.46 m BS to minus 29.12 m BS. The wind speed reached 6 m/s, predominantly from the southeast;

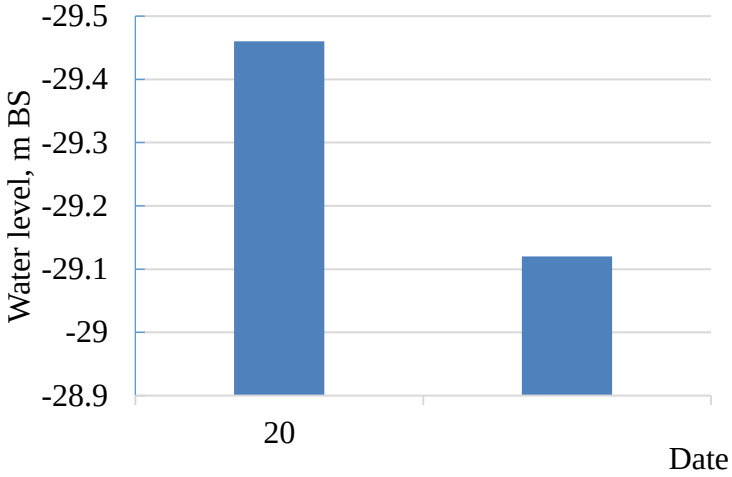


Figure. Graph of sea level changes in Fort-Shevchenko on April 20, 2025.

- On 27-28 April, a sea level rose by 19 cm was observed from minus 29.33 m BS to minus 29.52 m BS. The wind speed reached 8 m/s, predominantly from the northwest;

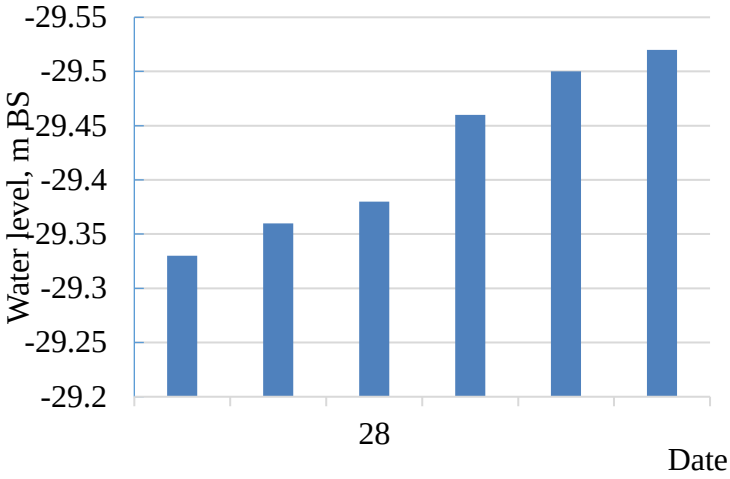
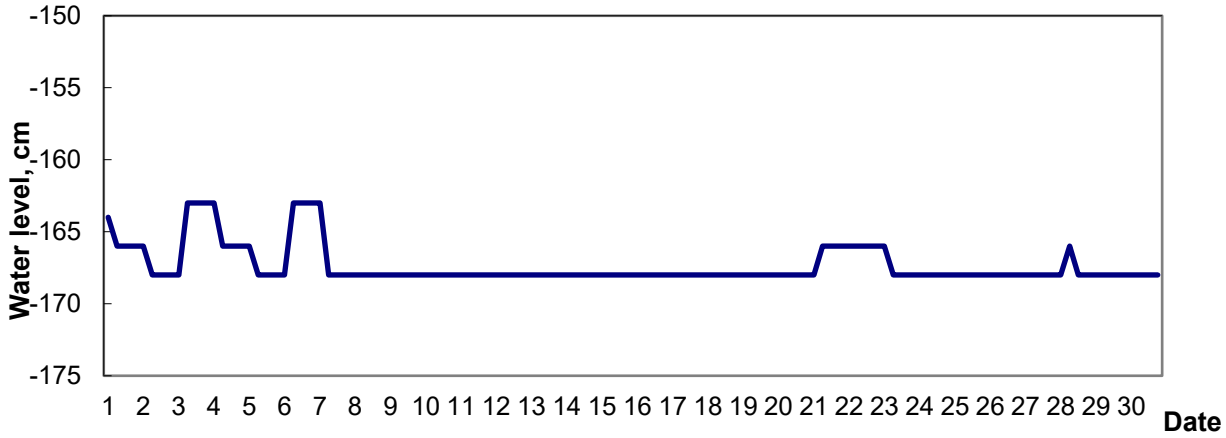


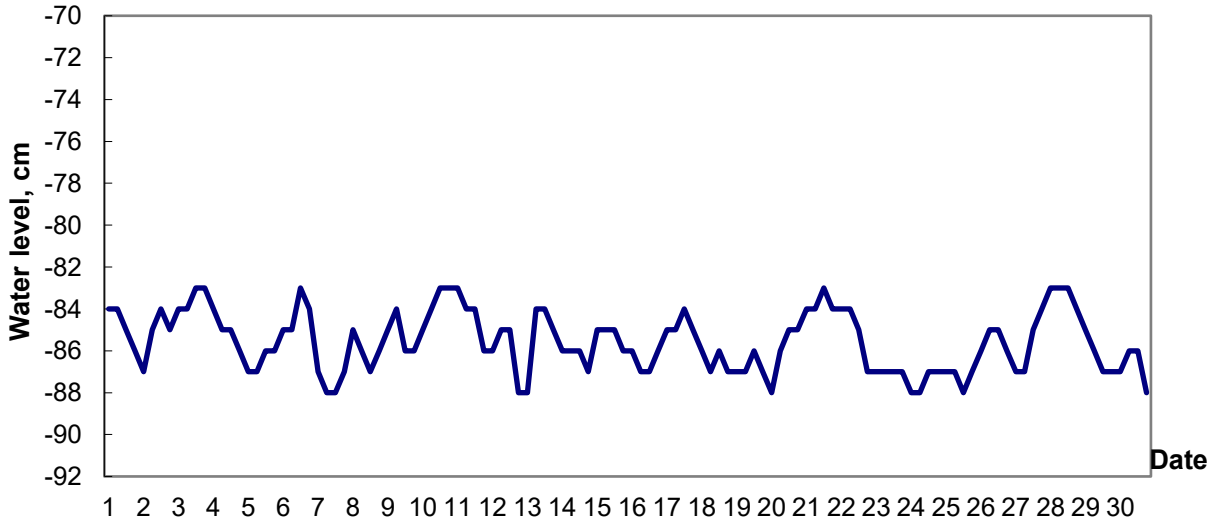
Figure. Graph of sea level changes in Fort-Shevchenko on April 27-28, 2025.

Saura



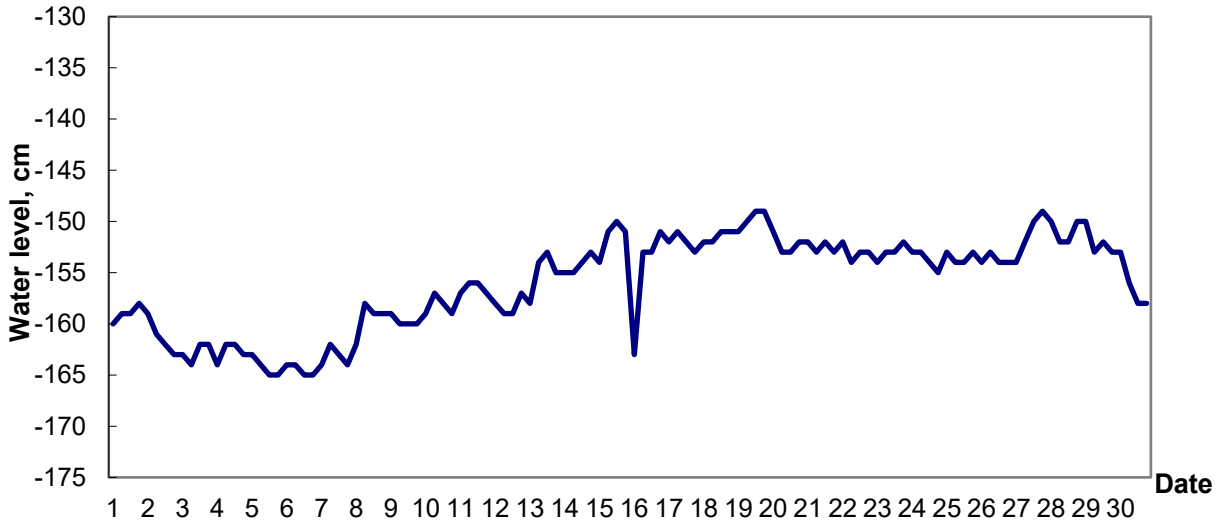
The runup and surge level fluctuations did not exceed 14 cm. The sea level change during the month fluctuated from minus 29.68 m BS to minus 29.63 m BS.

Peschany

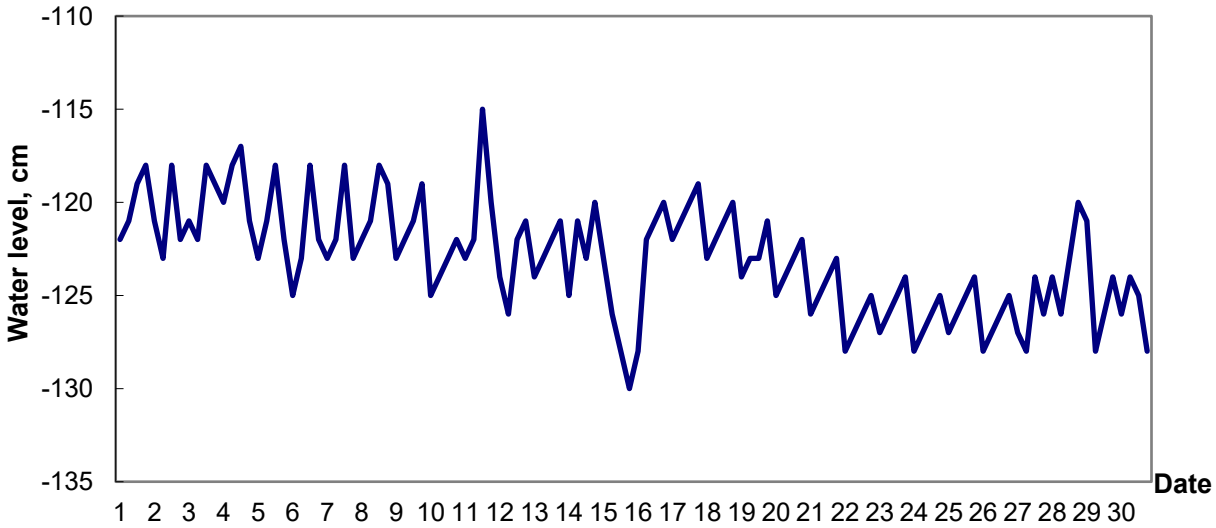


The runup and surge level fluctuations did not exceed 14 cm. The sea level change during the month fluctuated from minus 28.88 m BS to minus 28.83 m BS.

Aktau



Fetisovo



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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