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## Coastal zone dynamics - as a result of changes at the border of three environments

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Coastal zone research is becoming increasingly important because the impact of climate change is most significant here. The state of coastal regions is determined by the variability in three contact media (geological, water, and air). Evaluation of level changes on the coasts of various parts of the World Ocean (the Mediterranean, Black, Baltic and North Seas, and the Atlantic coasts in Brazil and France) over a long period of time shows various fluctuations with an upward trend in recent decades.

To highlight the factors that determine the seashores' level fluctuations, three contact media parameters were considered on the example of the western part of the Black Sea. Calculations, analysis, and comparison of trends in the variability of hydrometeorological characteristics (air and water temperatures, precipitation, and river discharge) and sea level over a period of more than 100 years have been carried out.

To assess the intensity of fluctuations of the coastal land along the western coast of the Black Sea, the series of level heights were considered at 6 Ukrainian stations: Vylkove, Chornomorsk (Ilyichevsk), Odesa-port, port Yuzhne, Ochakiv and Sevastopol (partially used as a benchmark), at 2 stations on the Romanian coast: Constanta and Sulina, and 2 stations on the Bulgarian coast: Burgas and Varna. Estimates of the dynamics of the land for the stations of this region's coastal zone for more than a 100-year period are calculated, and it is shown in which way changes in sea level are a consequence of the processes occurring in the coastal land and at the bottom.

Comparison of the years with extreme fluctuations in the sea level with the years of the global El Niño phenomenon showed that one of the causes of the observed disturbances in the water and air environments is the distant manifestations of this phenomenon.

Level fluctuations, both in the Black Sea and in the World Ocean, are synchronous at low-frequency scales (their period is more than 5 years) since global climatic processes on our planet influence them; short-term fluctuations are distinguished by regional features and are created under the influence of local factors (tectonic, geophysical, hydrostatic, etc.).

Modeling and predicting changes in the coastal zone of various parts of the World Ocean requires continuation of systematic observations of sea-level fluctuations, hydrometeorological characteristics, and seismic conditions in regions with the longest data series; it's crucial for the

Black Sea as well for the Mediterranean, Baltic, North Seas, and Atlantic shores.