Chapter 2. Morphology and bathymetry of the Kerch Strait

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The Kerch Strait linking the Black and Azov Seas plays an important role in the formation of hydrological and hydro-chemical peculiarities of the whole Azov-Black Seas Basin. In ancient times the area was known as the ***Cimmerian Bosporus*** (Photo).

Photo of picture: View across the Kerch Strait in 1839, by Ivan Aivazovsky.

The most important harbor along the coasts of the Kerch Strait is the Crimean city of Kerch which gives its name to the Strait. The Russian side of the Strait contains the Taman Bay encircled by the Tuzla Spit to the south and Chushka Spit to the north. The most important settlement on the Russian side is Taman where an important cargo port is under construction.

Due to its intermediate position between the two seas, the Kerch Strait water regime, coast morphology, bathymetry, sediments distribution and other geo-morphological parameters have significantly varied with time. The changes in the form and depths of the strait and adjacent areas of the Crimea, and especially of the Taman Peninsula, have become particularly significant, while certain elements of their present shoreline do not appear on historical maps, for example, the Tuzla Island (Fig. 2a, 2b).

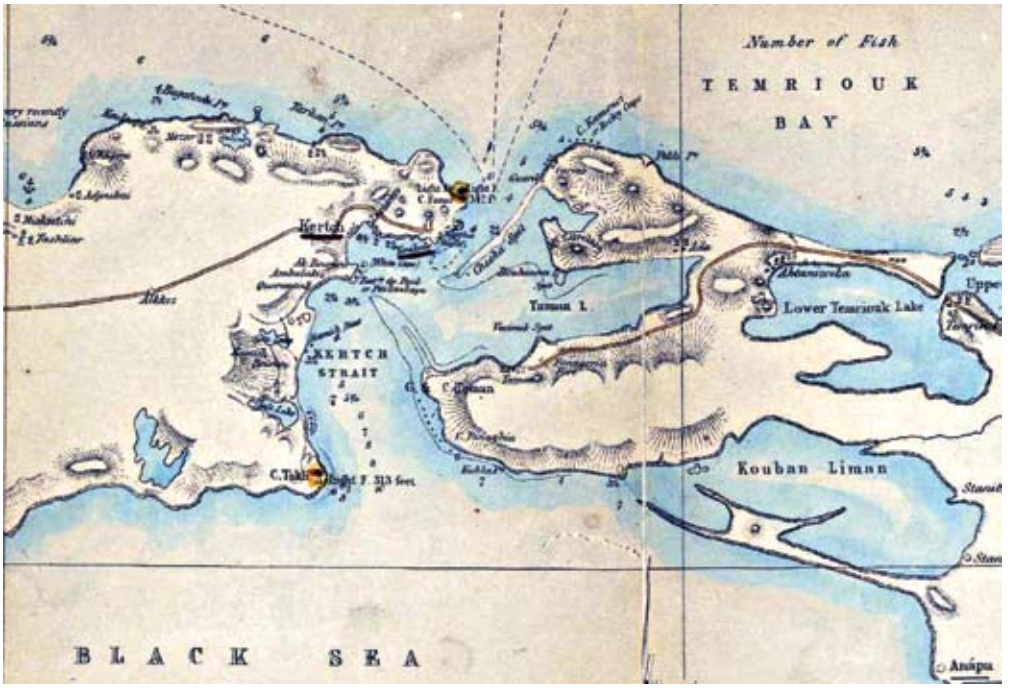

Fig. 2a. The Kerch Strait on the Stanford's Map of the Sea of Azov, 1855 (http://nla.gov.au/nla.map-rm341).

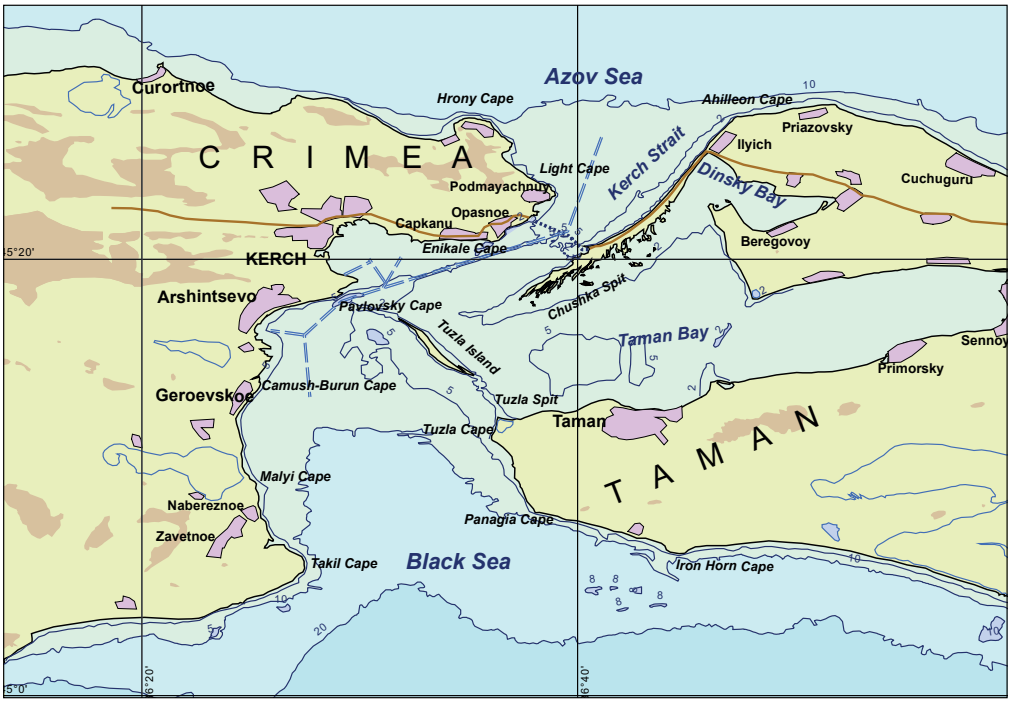

Fig. 2b. The modern state of the Kerch Strait shoreline and bathymetry.

The length of the Kerch Strait is about 43 km along a straight line and it is 5 km longer along the fairway (navigating channel). The width of the strait varies substantially from 3.7 km to 42 km. The Strait is shallow. Its maximum depth is 10.5 m at the Azov

Photo: Abrasive and flat coasts of the Kerch Strait (http://foto.3sea.org.ua/; http://media-kuban.ru/UGA_ru/; http://www.newsland.ru/news/detail/id/109638/).

Sea entrance and 18 m from the Black Sea side. Its depth gradually decreases closer to the middle of the Strait, where large areas are no more than 5.5 m deep (Fig. 1a). The total area of the Kerch Strait is about 805 km^2, while the total water volume is 4.56 km^3.

Major portions of the Kerch Strait are blocked by shoals of mud. Regular dredging is required to keep the vital modern shipping routes open between the Black Sea and the Sea of Azov. For instance, in the Kerch Strait 21 000 000 m^3 of soil were dredged and dumped in the time period from 1991 to 1997.

The coast of the Taman peninsula is a complex mixture of abrasive shores with rather well developed sandy accumulated structures like Chushka and Tuzla Spits, and some others.

The shore section of 22 km long from the Yantarny village up to the Panagia Cape is of abrasion nature. There is only small area from the Yantarny village to the Solenoe Lake where the shore is of accumulative origin. The shore section of 7 km long from the Panagia Cape to the Tuzla Cape is again of abrasion form. There are land slides there. The width of the beach here varies from 1 m to 10 m. There are two types of deposits there at the beach: sandy and sandy-gravel with exposure of base breed. The Tuzla Cape shore up to the distant end of the Tuzla Spit stretching for 7 km is of accumulative nature. The beach width here is of 1 m to 40 m. The width of the spit is 100–150 m. The spit was formed with limestone with the base of detritus and coquina (shelly ground).

The shoreline of the Taman and Dinsky Bays stretching for 85 km is flat and covered with reeds. Only the northern slope of the Taman Bay is of abrasion nature.

The shore from the Chushka spit to the Ilyich village of 18 km long is of accumulative origin. The distant end of the Spit is formed with coarse-grained detritus sand and large parts of beaten coquina. The eastern shore of the Spit is covered with the layer of seaweed of 30–64 centimeters thick and partially covered with reeds. From the Ilyich village to the Pekla Cape, the shore of 16 km long is of abrasion nature and there are landslides. The beach here is sandy with rocks at the base. There are wide sandy beaches at this section of the shore.

The bottom sediments particle size analysis clear indicates the dominance of coarse sand in the central part of the Kerch Strait (Fig. 2c). Accumulation of fine muddy particles (clay soil, silty soil) is expected only in the Kerch Bight and Taman Bay. The main stream from the Azov to the Black Sea along the strait axis washes constantly small particles from the bottom decreasing the transparency of the sea water.

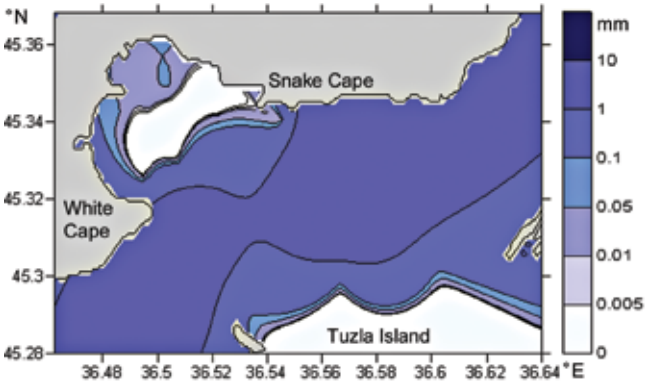

Fig. 2c. Particle size analysis of bottom sediments in the central part of the Kerch Strait in May 2005.