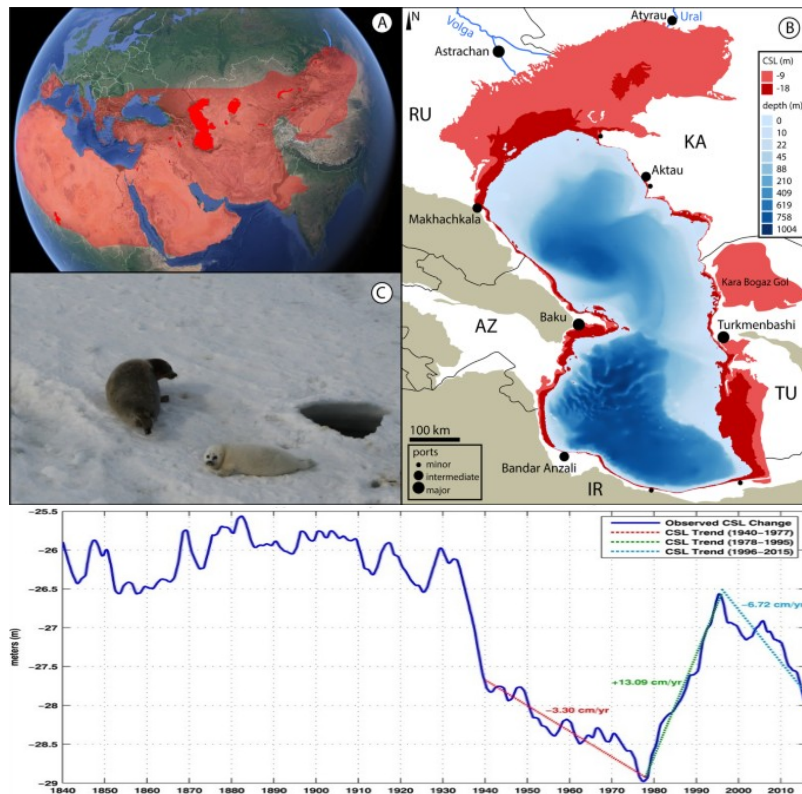


VOLATILE CASPIAN SEA LEVEL FEARED TO DROP TO IRREVERSIBLE LOW

The continuing rise and fall of the water surface of the Caspian Sea has puzzled scientists and worried fishermen and tourist operators for centuries. Now, prophets of gloom and doom predict a point of no return, indicating that the Caspian Sea could be threatened by the same fate of the Aral Sea, its counterpart to the east.



By Charles van der Leeuw*)

Back in the early 1990s, the sea pedestrian boulevard in the centre of Baku stood by and large under water, with attempts to protect from the rising Caspian Sea by a concrete fence poised to fail. Further to the south in the province of Talysh, they were even less lucky and entire strings of houses along the shore were flooded. The cause was known: a dramatic rise of the Caspian Sea level that had started in 1978 from 29 metre below ocean level and was on its way to reach up to 26.5 metre in 1995. "Since due to a sharp increase in the level of the Caspian Sea in 1978-1995, over 400,000 hectares of coastal areas were flooded, the high-ranking authorities of the coastal states put the creation of the flood hazard maps on the agenda, a report by the Taskent-based Eurasian Research Institute reads. "For instance, during this period only in Azerbaijan over 50 settlements, 250 industrial enterprises, 20 km of railways, 60 km

of highways, and recreational facilities for 100,000 people experienced floods. By some estimates, it inflicted \$2 billion in total economic damage for the country.”

From there on, the Casian started sinking to the level of -28m it has reached today, and the end does not seem to be in sight. Now, the global warming warriors have joined the chorus, and reports predicting a further drop to well over 30 metre to the detriment of the region’s maritime fauna and flora, are pouring over the public domain.

When continents and oceans came and went

The story goes back to the very origins of the Caspian Sea and the lands bordering it. During a period that started roughly 700 million years earlier and ended by the end of the Precambrian Age around 500 million years ago, or roughly 2 billion years after the formation of the earth, the present-day Caspian depression was on the outskirts of the mega-continent of Rodinia – one of the first split-offs of the land mass on the planet’s southern hemisphere into the water-covered north.

In the middle of the Devonian Period around, 300 million years back in time, a depression started to develop stretching from today’s location of the Aral Sea ever further to the west, leading to the formation of the Paleo-Tethys Ocean to the west with the Central-Kazakh plateau on its eastern shore, Baltica to its north and reaching as far as Gondwana towards the southwest.

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The Caspian Sea and its outlets to open waters

When the first proto-human in the region at some point between two and one million years back in time, the Tethys Ocean of old was not entirely dead yet, and the Caspian Sea, which included the Aral Sea and the lands between them and still had open waterways to the north and the west, was still "oceanic" enough to allow large areas to its east and its south to sustain subtropical conditions. It was only in the course of the II Millennium BC that the open waterway towards the north was closed, whereas the opening towards the Black Sea was still intact at the time of Alexander the Great in the IV Century BC.

It is known from biblical sources that when two centuries earlier the Philistinian sea-faring king Hiram sailed to the southeast Caspian shore and from there carried on by caravan to the borderlands between present-day Uzbekistan and Kyrgyzstan to collect gold from the mines located there in order to sell it to his friend and ally king Solomon of Israel the Manych strait must still have been navigable. For all it matters, some claim that Solomon came to the premises himself and built a temple in the present-day town of Osh, remains of which still exist.

Retrospective scientific calculations

According to geologists, surges in the Caspian Sea level occurred about a million years ago in the Tyurkynian age, 0.6 million years later in the Singilian era, and again 0.2 million years after that in the Kazarian epoch. From 100,000 years before our time, extreme surges became more frequent and occurred during the Atelian, Enotevkayan and Mangyshlakian periods – the latter ending around 6,000 years ago..

Whereas thus far Caspian Sea fluctuations are based on retrospective scientific calculations, serious contemporary monitoring of the sea surface level only started in the 1840s, after imperial Russia had consolidated its authority over most of the Caspian region which allowed scientists to do their work unhindered.

The work was continued into Soviet times, without, however, any scientists in the world being able to explain the phenomenon which differs entirely from oceanic level oscillations. It was observed, however, that for about a century the Caspian Sea kept oscillating around 26 metre within a margin no larger than a single metre.

Emissions scenarios come on board

This was to change abruptly in the course of the 1930s, when the sea level plunged to 28m below ocean level as of 1940, after which the dive continued at a slower pace, but nonetheless reached a bottom level of 26m as of 1978. From there, its reached its 1995 peak as described above only to tumble again. How this could end no one knows (no scientists as so far come up with a plausible explanation to the phenomenon) but those who venture into the realm of predictions offer a gloomy outlook.

“The level in the Caspian Sea is projected to fall by 9–18 m in medium to high emissions scenarios until the end of this century, caused by a substantial increase in lake evaporation that is not balanced by increasing river discharge or precipitation,” a report written in 2020 by researchers named Matthias Prange, Thomas Wilke and Frank P. Wesselingh read. “According to these new projections, twenty-first century Caspian sea level decline will be about twice as large as estimates based on earlier climate models. A decline by 9–18 m will mean that the vast northern Caspian shelf, the Turkmen shelf in the southeast, and all coastal areas in the middle and southern Caspian Sea emerge from under the sea surface. In addition, the Kara-Bogaz-Gol Bay on the eastern margin will be completely desiccated. Overall, the Caspian Sea’s surface area will shrink by 23% for a 9 m and by 34% for an 18 m drop of sea level.”

This means that even within the most moderate variant a fully loaded cargo vessel will hit the sea bottom – meaning in turn that extensive maritime traffic channels will have to be dug after the example of the current one from Astrakhan into the northern Caspian Sea from all present outlets between Makhachkala in Dagestan and Fort Chevchenko in northwest Kazakhstan. What will happen to the maritime flora and fauna – including the precious caviar-generating sturgeon – remains yet to be guessed...