



## **The changes in thermal regime of the Caspian Sea during the period 1940–2000**

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As an enclosed inland water body, the Caspian Sea is particularly reactive to both natural climate variability and anthropogenic forcing. A weekly mean Multichannel Sea Surface Temperature (MCSST) data set (spatial and temperature resolution of about 18 km and 0.1°C, respectively) during the period from November 1981 to December 2000 and available in situ measurements (1940–1980) were used to reveal the changes in thermal regime of the Caspian Sea during 60 years of the 20th century and SST response to the large-scale atmospheric forcing. It was found that the annual mean SST increased in the modern period (1982–2000) as compared to the previous period by about 1°C in the deep-water Middle and Southern Caspian, the maximal summer and minimal winter SST values also notably increased, while the SST annual range slightly decreased. These changes as well as a positive trend of SST of 0.05–0.10°C/year, which appeared to be several times higher than that in 1940–1980, resulted from the global climate warming. The time correlation of the marked anomalies of the winter and summer SSTs observed in 1950–2000 with the phases of the El Nino-Southern Oscillation and North-Atlantic Oscillation events demonstrated the influence of these atmospheric oscillations on interannual and decadal variability of the Caspian SST. During the period 1950–2000, the relation between cold and warm winters attributed to El Ninos was changed: in 1950–1980, cold winters prevailed, while by the end of the 20th century, warm winters became more frequent. Temperature changes in the Caspian and Black seas during 1982–2000 were similar in general features: positive and close values of SST trends, the character of changing the annual mean SSTs in 1989–1998 (with a minimum in 1992–1993), the clearly manifested positive temperature anomalies in the winter and summer of 1998–1999.

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