



Climate change impact on physical conditions of Caspian Sea

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Supposed change of physicochemical characteristics of marine environment as a result of climate warming will apparently exert great influence on intensity and balance of main ecological processes in marine ecosystems as well as on bioresources state in open and onshore regions of Caspian Sea. Influence of global warming on temperature condition of seas represents key forecasting problem of possible changes of all fundamental natural processes in new climatic conditions. According to our estimations annual average water temperature at all stations of North Caspian is positive and makes 0,2-0,4°C, and at stations situated in Average and South Caspian is insignificant, about 0,20°C. In conditions of climate warming and raising of Caspian Sea level it's possible to suppose that shallow water area will increase and correspondingly water temperature on these areas and on surface water masses of sea will increase. The attempt on assessment of water temperature change impact on spawning move of food fish of Caspian Sea was made by us. For this purpose on the basis of climatic scenario INMCM2.3.2, GFDL-T, GFDL-3, UKMO and HadCM2 water temperature change and consequently dates of food fish move were estimated. As a whole along Caspian water area temperature rise on surface layer is expected within the range 0, 5-2, 5 °C, i.e. less than on land. Long-term data on daily water temperature by way of functional dependence and data about the spawning beginning had been used for determination of spawning move of each kind of fish. Beginnings of spawning and its period for some kinds of fish of Caspian Sea were determined during climate change according to different scenarios. The analysis of received results shows that during realization of climatic scenarios fish resources will be developed

in normal conditions and no extreme case is expected. In conditions of spawning period change fish resources will adapt to them without any loss. If the main reason of Caspian Sea level rise was sea balance change due to water inflow increase as a consequence of climatic changes, then this had to lead to decrease of sea water salinity. That's why we have decided to investigate interrelation between sea level change and salinity of surface water layer. For this purpose we have analyzed long-term data of synchronous measurements of salinity and sea level on marine hydrometeorological stations. Connection between sea level and sea water salinity was estimated during the period from 1953 to 1994 and it is seen that during the period of sea level increase water salinity decreases. Correlation between water salinity and sea level on deep-water areas of Middle and South Caspian is high (0,6-0,8). In North Caspian water salinity has direct coupling with the volume of Volga waters inflow and as a consequence with sea level. At stations of North Caspian the connection between level and salinity is not very close, salinity is mainly under the influence of river waters inflow. At possible changes of sea level as a result of climatic changes no great changes in water salinity are expected. At established regime of sea water and salt balance elements the average water salinity of surface waters in open sea will be within the previous range -12, 7-12, 8 o/oo It should be mentioned that if salinity of Caspian water is more than 15 o/oo it becomes hazardous for Caspian fauna. That's why in saline Caspian bays in 50-70th of XX c. replacement of Caspian fauna with that one of Azov-Black Sea had taken place. Consequently current relatively high water level and its possible rise up to 25-26m abs will be very favorable for the development of biological resources of Caspian Sea.