Investigation of thermal layering phenomenon of Minab dam using Ce-qual-w2 model and its effect on water quality in Bandar Abbas

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Abstract

One of the factors affecting the water quality behind dams is the occurrence of processes such as thermal stratification and nutritionalism, which causes a sharp decline in water quality. The main purpose of this study is to evaluate the effect of thermal and nutritional layering of the Minab Dam reservoir and the effect of layering on the quality of drinking water in Bandar Abbas.In order to simulate and study the process of thermal layering and nutrition of the dam reservoir, samples were taken from 3 stations inside the dam for a period of one year from June 1, 1997 to the end of May 1998 and the layering method was Examined using the two-dimensional qualitative model CE-QUAL-W2. Modeling studies showed that the reservoir of Minab Dam has a summer stratification cycle for 10 months and mixing is done from December to March with decreasing temperature. Complete mixing takes place in December. The reservoir is in nutritional condition. The maximum temperature difference between the upper and lower layers of water was about 23 degrees in late August. The findings also showed that the presence of thermal stratification in the dam lake indicates changes in physical, chemical and biological quality of water at different levels, which with a duration of 10 months leads to inadequate water quality in the reservoir quality in the reservoir, of course inadequate drinking water quality in Bandar Abbas. With the continuation of these changes for 10 months, the layering of water quality downstream of the dam has changed. And the quality changes of drinking water in Bandar Abbas are also interpreted in this regard. Therefore, it is better to help the vertical mixing of the reservoir in different seasons of the year, especially the watery season, by extracting more water from the lower valves of the reservoir, in which case the nutritional conditions of the reservoir will be improved by reducing phosphate released from the floor sediments.

Keywords: Minab Dam, Water quality, Thermal layering, Nutrition, W2-QUAL-CE.

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