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Salinization forced anoxia in the Sea of Aral, the Dead Sea and the Urmia Lake: a temporal feature of the salt lakes development under the Global Change?

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The Sea of Aral is undergone a process of its volume decrease and salinization started about 30 years ago. In the remained now lake in the former deepest part of the Sea the salinity increased from about 8 PSU in 1990 to 120 PSU in the surface layer, and 240 PSU in the bottom layer in 2015. On top of an increase of salinity, there was formed a sulfidic zone in the bottom layer, that was separated from the upper layer by an extremely strong halocline (more than 50 PSU in 100 cm). The reason of this halocline might be an influx of the heavy high salinity water formed in summer in the shallower part of the Aral Sea to the bottom layer of the deeper part of the Sea through a strait between them. The similar processes could take place in the Urmia Lake, where salinity increased from 120 PSU in 2000 to about 350-400 PSU in 2015. This lake also consists from a shallow and deep parts connected by a channel in the dam, and where there was also reported anoxia. And finally, the Dead Sea demonstrates a further development happened after the shallower Southern part of the Sea was totally evaporated. After 1993 the vertical mixing started to occur down to the bottom layer, and the lake regime changed from meromictic to monomictic, that resulted in aeration of the bottom layer. In this work we compare interannual changes of the main salinity components in the 3 water bodies and analyze results of the vertical chemical structure of the Sea of Aral studied in 2015.