



## **XBT effects on the global ocean observation system in the early 21st century**

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During the early 21st century, we have experienced a transition period of global ocean observing system from expendable bathythermograph (XBT) to Argo. There has been decreasing of XBT observations, but significant increasing of Argo profiles in the global ocean. However, evaluation of the XBT observation system during this period has little been presented. Here, this study investigates the XBT effects on the global ocean observing system by using GFDL data assimilation model. After Argo period, the amount of heat content correction by XBT assimilation is significantly weakened especially in the upper ocean, but it remains in the deeper oceans below 700 m depth within a dynamic model system. This study also confirms that although XBT only provides temperature observations mostly in the upper 700 m of the northern hemisphere, it can affect both temperature and salinity fields of data assimilation system especially in the deep and southern oceans.