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Advances in quality control system of ocean thermohaline data

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Data quality is the prerequisite condition determining the correctness of the research. However, there're still a lot of data quality problems existing in the international sharing marine data nowadays. Especially, it is hard to identify the non-conventional "artificial" data error by the traditional methods of quality control. Based on the previous quality controlling about the WOD09 data which is widely used in the world, it is found that among the data of 301740 stations randomly sampled from different geographical areas, data of 4351 stations is failed in error identification in total, accounting for 1.44% error information. The existence of such error information will great possibility affect the research findings.

Targeting for such quality problems of international sharing data, we develop the global temperature and salinity data management system to collect and standardize data from diverse sources according to the independently designed ODSF1 data format, which helps optimize the traditional methods for data quality control and repeated data removal. Besides, for the data processed by artificial means (falsification data) and the "simulation" data of the quasi-repeated measurement station, we develop a whole set of "error information identify, analyze, and diagnose technologies", including functions of "extreme value location, track map diagnosis, timing analysis, intelligent repeated data removal, and Salt-Density mode test", thereby providing multiple types of data quality control analysis through the way of "expert-machine" combination.

The construction of this system has effectively diagnosed and marked a great of data quality problems existing in the international marine data that is now under circulating, and has formed a data set which is more competitive in quality compared with the WOD data; established a set of quality control system for different sea areas, different months, different levels, different temperature and salinity observation parameters within the region from China offshore to Western Pacific, thereby consolidating a sound foundation for scientific researchers using the international sharing data.