

Global Nutrients Dataset 2013 and its application to studies of global physical/biogeochemical changes in the ocean

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To better manage the global impacts of human activities on the world's oceans, it is necessary to have accurate observations of changes in carbon and dissolved nutrients in both upper and deep ocean waters. Therefore it is very important and basic issues to improve comparability of nutrients data in the world ocean. In this presentation, a new dataset for nutrients in sea water, Global Nutrient Dataset 2013 (GND13), is presented. GND13 is already published with a doi: 10.17596/0000001 at web site of JAMSTEC. The data in the dataset are traceable to the SI. Although data synthesis work was made also for previous datasets such as WOA09, WOA13, GLODAPv2, etc., influences of quality of original data are not controlled sufficiently, and the traceability is not guaranteed. These are caveats of previous dataset. The GND13 has comparability and traceability of data, because the dataset is well quality-controlled based on data collected during CLIVAR and subsequent GO-SHIP cruises mainly by the R/V Mirai, where reference materials for nutrients in seawater were used. About 47000 profiles from WOCE/CLIVAR cruises were compiled and factor correction based on comparison within 250km radius at 120 cross over points in global ocean. An average nutrients concentration between 1000 m and 2000m for each profile was calculated after quality control to discard outliers. Factors to correct offset were determined as the nutrients concentration obtained using Reference Materials of Nutrients in Seawater, RMNS, should be assigned factor 1, then the factors for other cruises were assigned. Then factors obtained for each cruise were propagated worldwide. Not only obtaining factors of each cruise, a gridded dataset was created which have vertical 138 levels and horizontally interpolated in 0.5 deg. by 0.5 deg. field. This new approach can provide more realistic distribution of nutrients in the world ocean and this would be useful to study changes in the distribution of concentrations of nutrients in the world ocean and also useful as new initial conditions for modelers who studies global changes.

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