

Interactive comment on “Global CRM/RM-scaled nutrient gridded dataset GND13” by Michio Aoyama

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Received and published: 4 December 2019

Many thanks for your very positive words. I also believe that my GND13 dataset will be widely used for many years to come.

Your comment: One minor item that should be revised appears on Page 7 line 15 where the author says that no reference material of oxygen measurements exists. This is incorrect. OSIL makes a certified potassium iodate standard. These CRMs for oxygen work are not in wide use but should be. With their widespread use it should be possible to reduce oxygen CVs of cross over comparison from 5% to 1% or better. My reply: For the certified potassium iodate standards, I recognize that there are several KIO₃ solutions in our world. My meaning in the submitted text was that there are no

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seawater matrix dissolved oxygen standard of which oxygen concentration is assigned or certifies. KIO₃ solution can not directly give unbroken chain of comparison which give explicit SI traceability. So, I changed a sentence at Page 7 line 15 to make clear current situation about comparability and traceability of dissolved oxygen measurement in the text as below.

Page 7 line 15 The corresponding values for category 1 oxygen measurements were similar to those for category 2–7 cruises because no seawater matrix certified reference materials for oxygen measurements exist but some comparability was ensured by potassium iodate solution of known concentration as stated in the Introduction. I also add some explanation about current status of comparability of dissolved oxygen based on potassium iodate solution in the Introduction as below. On the other hand, the method for determining the dissolved oxygen concentration in seawater is generally the Carpenter method (Carpenter, 1965), which is an improvement of the Winkler method, but is hereafter simply referred to as the Winkler method. In this Winkler method, manganese hydroxide “fixes” dissolved oxygen under alkaline conditions, and the “fixed” dissolved oxygen quantitatively oxidizes iodine ions to free iodine under acidic conditions. Titrating the free iodine with a sodium thiosulfate solution of known concentration indirectly quantifies the dissolved oxygen concentration. The sodium thiosulfate solution concentration is determined by titration of a potassium iodate solution of known concentration (potassium iodate quantitatively oxidizes iodine ions to free iodine under acidic conditions). In Japan, SI-traceable certified reference potassium iodate standards are supplied by the National Meteorology Institute of Japan, National Institute of Advanced Industrial Science and Technology (NMIJ). Ocean Scientific International Ltd, OSIL, UK, and FUJIFILM Wako Pure Chemical Corporation, Japan, also provides Potassium Iodate solutions, which are used to standardise the thiosulfate solution in the widely used Winkler titration method. Therefore, dissolved oxygen concentration measured around the world had some extent of comparability. However, the dissolved oxygen concentration determined by the Winkler method includes the concentration of interfering substances in the seawater sample. End of reply

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