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Improving Understanding of Organic Metal-binding Ligands in the Ocean

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Improving Understanding of Organic Metal-Binding Ligands in the Ocean

Organic Ligands—A Key Control on Trace Metal Biogeochemistry in the Ocean; Salt Lake City, Utah, 25 February 2012

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The first meeting of the new Scientific Committee on Oceanic Research (SCOR) Working Group (WG) 139 was held in February following the joint 2012 Ocean Sciences Meeting, which was sponsored by the Oceanography Society, the Association for the Sciences of Limnology and Oceanography (ASLO), and AGU. This WG's aim is to improve scientists' understanding of the role of organic metal-binding ligands in oceanic biogeochemistry through an interdisciplinary collaboration of members comprising trace metal biogeochemists, organic geochemists, and biogeochemical modelers.

Organic metal-binding ligands control the bioavailability of trace metals and thus influence pivotal global elemental cycles, such as those of carbon and nitrogen. To date, the sources, chemical structures, and degradation mechanisms of organic metal-binding ligands are still not well understood, making it difficult to model them with sufficient confidence to predict how they, and consequently

trace metal cycles, will respond to projected global alteration of continental aridity (dust supply), ocean acidification, and oceanic oxygen minimum zones due to a changing climate. Consequently, the overarching goals of SCOR WG 139 are to (1) promote improvements in quality, accessibility, and development of analytical methodologies for characterizing metal-binding ligands in seawater, (2) characterize which components of the dissolved organic matter pool make a significant contribution to the biogeochemistry of trace metals in the oceans, and (3) identify the role of ligands in microbial ecology and marine biogeochemical cycles.

During the meeting, members agreed on terms of reference (TORs) to define the work statements for WG 139. These include implementation of ways to improve methodology for determining organic ligands, expansion of ligand intercalibration exercises, launch of a new database for organic metal-binding ligand data, and publication of WG outcomes in peer-reviewed literature and a best practices guide for the determination of organic metal-binding ligands. Over the

next 9 months the WG's action plan includes facilitating a new intercalibration exercise, completing summaries of important building blocks (e.g., methods currently applied, time series ligand data, and biochemical pathways of trace metals) for the best practices guide, and identifying additional funding sources to drive this project forward.

A second meeting of SCOR WG 139 is planned for the 2013 ASLO Aquatic Sciences Meeting, to be held in New Orleans, La. A special session has been proposed to encourage scientists interested in the goals of WG 139 to take part in the discussion and actions necessary to fulfill the TORs. WG 139 is currently fully sponsored by SCOR, with additional funding being sought to cover future costs related to the TORs, specifically with regard to capacity building in developing countries and intercalibration exercises.

Anyone interested in the goals of this WG is encouraged to contact the coauthors and authors of this report. For more information about SCOR Working Group 139 and its full TORs and a list of members, see http://www.scor-int.org/Working_Groups/wg139.htm.

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