

Accepted Manuscript

Sources and cycling of mercury in the paleo Arctic Ocean from Hg stable isotope variations in Eocene and Quaternary sediments

JD Gleason, JD Blum, TC Moore, L Polyak, M Jakobsson, PA Meyers, A Biswas

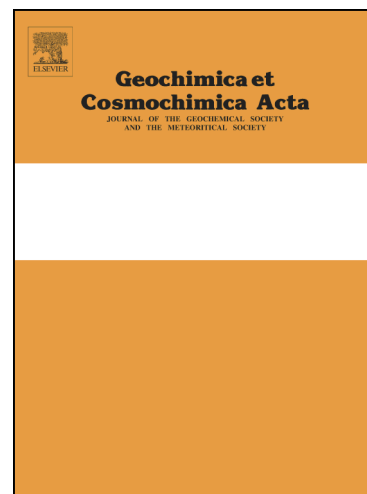
PII: S0016-7037(16)30611-1
DOI: <http://dx.doi.org/10.1016/j.gca.2016.10.033>
Reference: GCA 9988

To appear in: *Geochimica et Cosmochimica Acta*

Received Date: 29 April 2015
Revised Date: 19 October 2016
Accepted Date: 22 October 2016

Please cite this article as: Gleason, J., Blum, J., Moore, T., Polyak, L., Jakobsson, M., Meyers, P., Biswas, A., Sources and cycling of mercury in the paleo Arctic Ocean from Hg stable isotope variations in Eocene and Quaternary sediments, *Geochimica et Cosmochimica Acta* (2016), doi: <http://dx.doi.org/10.1016/j.gca.2016.10.033>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



1 **Sources and cycling of mercury in the paleo Arctic Ocean from Hg stable isotope variations**
2 **in Eocene and Quaternary sediments**

3
4 JD Gleason¹, JD Blum¹, TC Moore¹, L Polyak², M Jakobsson³, PA Meyers¹, A Biswas⁴

5
6 ¹ Department of Earth and Environmental Sciences, University of Michigan, Ann Arbor, Michigan, USA

7 ² Byrd Polar and Climate Research Center, Ohio State University, Columbus, Ohio, USA

8 ³ Department of Geological Sciences, University of Stockholm, Sweden

9 ⁴ Faculty of Earth Science, Evergreen State College, Olympia, Washington, USA

10
11 Corresponding Author: J.D. Gleason, Department of Earth and Environmental Sciences, University of Michigan,
12 Ann Arbor, Michigan, USA (e-mail: jdgleaso@umich.edu; phone: 734-764-9523; fax: 734-763-4690)

13
14 **Keywords:** Mercury isotopes; Marine sediments; Central Arctic Ocean; Cenozoic; PETM

15
16 Abstract

17 Mercury stable isotopic compositions were determined for marine sediments from eight locations
18 in the Arctic Ocean Basin. Mass dependent fractionation (MDF) and mass independent
19 fractionation (MIF) of Hg stable isotopes were recorded across a variety of depositional
20 environments, water depths, and stratigraphic ages. $\delta^{202}\text{Hg}$ (MDF) ranges from -2.34‰ to -
21 0.78‰; $\Delta^{199}\text{Hg}$ (MIF) from -0.18‰ to +0.12‰; and $\Delta^{201}\text{Hg}$ (MIF) from -0.29‰ to +0.05‰ for
22 the complete data set (n = 33). Holocene sediments from the Chukchi Sea and Morris Jesup Rise
23 record the most negative $\Delta^{199}\text{Hg}$ values, while Pleistocene sediments from the Central Arctic
24 Ocean record the most positive $\Delta^{199}\text{Hg}$ values. The most negative $\delta^{202}\text{Hg}$ values are recorded in
25 Pleistocene sediments. Eocene sediments (Lomonosov Ridge) show some overlap in their Hg
26 isotopic compositions with Quaternary sediments, with a sample of the Arctic Ocean PETM (56
27 Ma) most closely matching the average Hg isotopic composition of Holocene Arctic marine
28 sediments. Collectively, these data support a terrestrially-dominated Hg source input for Arctic
29 Ocean sediment through time, although other sources, as well as influences of sea ice,
30 atmospheric mercury depletion events (AMDE), and anthropogenic Hg (in core top samples) on
31 Hg isotopic signatures must also be considered.

Download English Version:

<https://daneshyari.com/en/article/8911047>

Download Persian Version:

<https://daneshyari.com/article/8911047>

[Daneshyari.com](https://daneshyari.com)