Geophysical Research Abstracts,
Vol. 10, EGU2008-A-12210, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-12210
EGU General Assembly 2008

Reversing sea level rise by enhancing the natural sulfur cycle

O.W. Wingenter (1,2), J. Moore (3), S.M. Elliot (4) and D.R. Blake (5)

(1) Department of Chemistry, New Mexico Tech, Socorro, NM, USA, (2) Geophysical Research Center, New Mexico Tech, Socorro, NM, USA, (3) Computer Science Department, New Mexico Tech, Socorro, NM, USA, (4) Climate Ocean Sea Ice Modeling Project, Los Alamos National Laboratory, Los Alamos, NM, USA, (5) Department of Chemistry, University of California, Irvine, CA, USA

The greatest climate effect of ocean iron fertilization may be in enhancing demithyl sulfide (DMS) production, leading to changes in the optical properties of the atmosphere and cooling. We describe a well leveraged approach to partially regulate climate that may slow or reverse sea level rise. By feritlizing just a small portion (about 2%) of the Southern Ocean (SO) with iron, the natural sulfur cycle could be stimulated enough to produce extra (about 20%) dimithyl sulfide which could lead to an increase in cloud reflectivity that could cool the SO region. Our plan differs greatly in size and intended outcome from full scale ocean iron fertilization of the Southern Ocean (SO) as proposed previously to help mitigate rising CO2 in the atmosphere. Some regions of the Earth's oceans are high in nutrients but low in primary productivity. The largest such region is the SO followed by the equatorial Pacific. Several mesoscale (100 kmˆ2) experiements have shown that the limiting nutrient to productivity is iron. Yet, the effectiveness of iron fertilization of sequestering significant amounts of atmospheric CO2 is still in question. However, marine micoorganisms not only consume inorganic carbon but also produce and consume man climate relevant organic gases. It appears that full scale fertilization of the SO is not a viable geoengineering solution because it would lead to over cooling of the region. Our proposal would act to increase gross primary despite the slight loss in sunlight.