

SOLAS Open Science Conference 2009

Focus 1: Biogeochemical interactions and feedbacks between ocean and atmosphere.

Role of pelagic calcification and export of carbonate production in climate change

Lei Chou¹, Jérôme Harlay¹, Caroline De Bodt¹, Nathalie Roevros¹, Alberto V. Borges², Kim Suykens², Bruno Delille², Koen Sabbe³, Nicolas Van Oostende³, Anja Engel⁴, Judith Piontek⁴, Corinna Borchard⁴, Nicole Händel⁴ & Steve Groom⁵

The marine carbon cycle constitutes a key component of the climate system. It has been shown that one-fourth of the anthropogenic CO₂ emitted to the atmosphere is absorbed by the ocean, leading to the acidification of the surface ocean and the modification of seawater carbonate chemistry. This could have major impacts on the ocean biogeochemical carbon cycling and ecosystem dynamics. Yet, the resulting feedbacks on climate change are still poorly understood. Interdisciplinary biogeochemical investigations, assisted by remote sensing, have been conducted during three consecutive years along the shelf break of the Northern Bay of Biscay where coccolithophorid blooms dominated by *Emiliana huxleyi* are frequently and recurrently observed. Rates of various processes governing the coccolithophore ecosystem dynamics have been determined and air-sea CO₂ fluxes evaluated. The key results will be presented and discussed to evaluate the role in climate regulation of calcification, primary production and export processes during coccolithophorid blooms.

¹ Laboratoire d'Océanographie Chimique et Géochimie des Eaux, Faculté des Sciences, Université Libre de Bruxelles, B-1050 Brussels, Belgium
(Lei.Chou@ulb.ac.be)

² Unité d'Océanographie Chimique, Université de Liège, B-4000 Liège, Belgium

³ Protistologie & Aquatische Ecologie, Universiteit Gent, B-9000 Gent, Belgium

⁴ Alfred Wegener Institute for Polar and Marine Research, D-27515 Bremerhaven, Germany

⁵ Remote Sensing Group, Plymouth Marine Laboratory, Plymouth PL1 3DH, United Kingdom