



Lead Author e-mail: roseline.cutting@gmail.com

Title: *Spatial Variation of Trace elements in Svalbard during Early Spring 2011*

Roseline C. Thakur¹, Meloth Thamban¹, B. L Redkar¹

¹*National Centre for Antarctic and Ocean Research, Headland Sada, Vasco da Gama, Goa-403804, India*

To investigate the spatial distribution and source pathways of environmentally critical trace metals in Svalbard, trace elemental concentrations were analyzed in 16 snow core samples collected from four different locations during February – March 2011. The samples were collected from two glacier regions, Austre Broggerbreen and Vestre Broggerbreen which are distinct in their topographic features, coastal snow pack and sea ice region of Svalbard. The samples were analyzed using the clean protocols through an inductively coupled plasma mass spectrometer for 16 trace elements. Results indicate that the concentrations of elements like Li, V, Cu, Zn, As, Se, and Pb were maximal at higher elevation and the concentrations of elements like Mg, K, Al, Ca, Cr, Mn, Fe, Sr and Na were maximal at lower elevations at Austre Broggerbreen glacier. On the contrary, at Vestre Broggerbreen Li, Mg, Na, V, Al, As, Zn, Cu, Se, Sr and Pb increase with decreasing elevation and crustal elements like Ca, Cr, Mn, Fe and Pb decreased with descent. Such concentration variation with respect to altitude coupled with enrichment factors suggests that Austre Broggerbreen glacier at high elevations was primarily influenced by crustal and anthropogenic elements whereas the marine influence was dominant at lower altitudes. No anthropogenic influence was observed at high elevations at Vestre Broggerbreen glacier but marine and anthropogenic impact was dominant at lower altitudes. The trace elements like Cu, As and Se are suggested to be the main anthropogenic elements during the study since they reflect high marine and crustal enrichment factors at all the four study sites in Svalbard.

Keywords: Trace elements, Snow cores, Enrichment factors