**Abstract**

Global warming and the consequent melting of the Arctic ice at an alarming rate is well documented. Though satellite pictures are available from which the ice loss, both seasonal and annual, are estimated in the Arctic, independent confirmation of these estimates would be useful. Stable oxygen isotopic ratio δ18O, measured as deviations in part per thousand (or per mil, ‰) from that of a standard such as Standard Mean Ocean Water (SMOW) is a well known useful tracer in snow hydrology. It can be used to quantify the extent of snow/ice melt in the Polar Regions, to corroborate the ice loss measurements made from satellites.

 In this talk I explain how this is done and present some examples from the Arctic and the Himalaya. Basically, ice/snow melt reaches the surrounding oceans and reduces the surface salinity and also the δ18O, as the freshwater in the Polar Regions is extremely depleted in 18O.Therefore the linear relationship between the salinity and the δ18O of the surface ocean changes. We have developed a theoretical model through which we can quantify the changes in the slope and intercept of the salinity-δ18O relationship of the surface ocean. We explain this model and also use it to calculate the melt water flow into the Bay of Bengal from the Himalaya and also the Arctic. We believe that this is a useful method to complement satellite data.