ID: Type: **Poster**

# Uranium and Thorium in Cox's Bazar Paleo-Beach Groundwater: Insights into the Source(s) and Mobility in the Cox's Bazar Coastal Area, Bangladesh

Ninety eight groundwater samples collected from paleo-beach and its adjoining areas were analyzed using ICP-MS. Physico-chemical parameters were also measured in situ. Concentrations of U (<0.01 - 3.40 ug/l), and 4% of shallow tubewells (<30m deep) contained excess the WHO (1998) guideline, 2.0 ug/l and limited in paleo-beach area. Concentrations of Th (<0.01- 1.60 ug/l) and Ce (0.01 - 9.89 ug/l), both of which do not have the WHO guideline values, are strongly correlated. U and Th rich groundwater occurred in the high Eh (0.35- 0.5V), and found in pH (6.6 to 7.5) and (8.0 to 8.5) respectively. U correlated between its concentration to EC (220 - 3655 uS/cm) and alkalinity (1.24 - 13.12 meq/l), and an inversely with Pb concentrations, indicating solubility of U-bearing minerals by carbonate complexation and predicted that successive recoils of U and Th and release of Ra, Rn and Pb and enrichment by adsorption processes. SEM-EDX studies on monazite and zircon grains, taken from the out crop of Paleo-beach area, contained U(5.21 wt%) and Th (16.48 wt%).

Release of U and Th from heavy minerals and measurement of radioactivity should be the focus of further research to better understand the mobilization processes in Paleo-beach aquifers.

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**Track Classification:** Theme 2: Events and Their Characterization