



Historical records and contamination assessment of potential toxic elements (PTEs) over the past 100 years in Ny-Ålesund, Svalbard.

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Abstract: Ny-Ålesund has been significantly impacted by anthropogenic activities (e.g. coal mining, scientific research, tourist shipping) over the past 100 years. However, the studies of potential toxic elements (PTEs) contamination in Ny-Ålesund currently mainly focus on surface soil or surface fjord sediments, and little is known about the history and status of PTEs contamination over the past 100 years. In this study, we collected a palaeo-notch sediment profile YN, analyzed the contents of six typical PTEs (Cu, Pb, Cd, Hg, As, Se) in the sediments, and assessed the historical pollution status in Ny-Ålesund using the pollution load index, geo-accumulation index and enrichment factor. The results showed that the contents of PTEs over the past 100 years increased rapidly compared with those during the interval of 9400-100 BP. In addition, Pb, Cd and Hg showed a clear signal of enrichment and were the main pollutants among the PTEs analyzed. The contamination was likely linked to gas-oil powered generators, coal mining, research station, tourist shipping and long-range transport of pollutants.

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