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Environmental radioactivity and tracer studies over the past sixty years in Denmark

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Studies of environmental radioactivity were initiated in 1956 at the Research Establishment Risø located at Roskilde, Denmark. This paper aims to give a brief overview of the investigations carried out in Denmark for environmental radioactivity and tracer studies over the past sixty years.

Our systematic record of environmental radioactivity data clearly indicate the anthropogenic radionuclides signal originated from global fallout of nuclear weapons testing during the 1960's, fallout of the Chernobyl accident in 1986 as well as the Fukushima accident in 2011 (see Fig.1). After the accident at Thule, Greenland in 1968, comprehensive studies have been carried out to investigate the local radioactive pollution (¹³⁷Cs, ⁹⁰Sr, ^{238,239,240}Pu, ²³⁷Np, ⁹⁹Tc, ²⁴¹Am) and its radiological impact to the Arctic marine and terrestrial environment. Radioactive tracers (e.g., ⁹⁹Tc, ¹²⁹I) released from the two major European reprocessing plants (La Hague and Sellafield) have been employed as point source tracers to studies the water movement in the North Atlantic-Arctic region. In recent years, ²³⁶U oceanographic studies have also been carried out to investigate the source term of ²³⁶U in North Sea-Baltic Sea region as well as along Greenland coast.

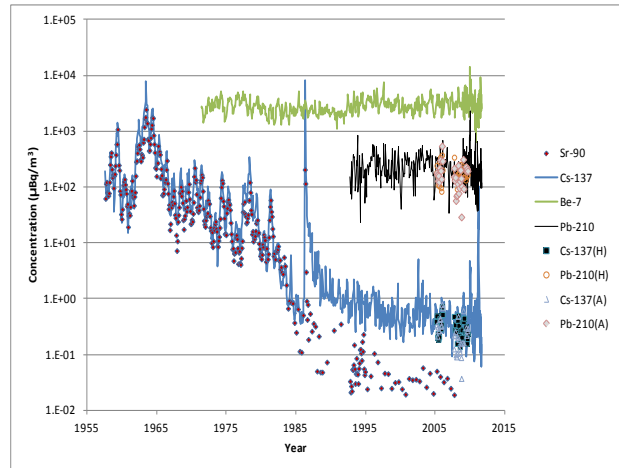


Fig1. Time series record of radioactivity in the air at Risø, Roskilde, Denmark