Contribution ID: **58** Type: **Poster**

Applying Sediment Cores and Nuclear Techniques for Pollution Assessment in the Bonny/new Calabar River Estuary, Niger Delta, Nigeria

Thursday, 27 August 2015 14:00 (1h 30m)

Sediment cores were collected from the Bonny Estuary in August 2011 to archive pollution records over the last 80 years. Three sampling locations were selected and used for assessing the extent of pollution in the estuary. Alpha and gamma spectrometer in conjunction with the constant rate of supply (CRS) model were deployed to establish the age of the sediment and the data were validated using 137Cs profiles and events that occurred within the region. The results of the activities of naturally occurring radionuclides (226Ra, 228Ra and 40k) ranged between 15 ± 2 and 34 ± 3 Bq·kg-1; 32 ± 5 and 48 ± 6 Bq·kg-1; 264 ± 29 and 462 ± 36 Bq·kg-1, respectively. The profiles of stations 1 and 2 exhibited a relatively constant activity but that of station 3 showed significant decrease with depth which was appropriate for radiometric dating. CRS model displayed an increase in the bulk sediment accumulation over the past 80 years, with special reference to 1938, 1955, 1973 1997 and 2004. The cesium-137 profile was in agreement with the CRS established ages. The sedimentation rates obtained ranged from 0.019 to 0.034 g.cm-2.y-1. The data further revealed that minor and major environmental perturbations occurred in the early 1970s and late 1990s respectively. Core profiles of total hydrocarbon content ranged from 0.001 to 130.80 ppm and total phosphorus 0.01 to 0.499 mg/g. The observed profiles had peaks corresponding chronologically to severe environmental perturbations resulting from massive oil spills and substantial delivery of phosphorus from agricultural runoffs between early 1970s and early 2000s. It is therefore surmised that since the advent of industrial activities the estuary has been subject to perturbations and contamination from human activities which has resulted in adverse fluctuations in environment conditions.

Country or International Organization

Nigeria

Primary author: OMOKHEYEKE, Omorotionmwan (CENTRE FOR MARINE POLLUTION MONITORING AND SEAFOOD SAFETY ,UNIVERSITY OF PORT HARCOUR, NIGERIA)

Co-authors: Prof. SIKOKI, Francis (CENTRE FOR MARINE POLLUTION MONITORING AND SEAFOOD SAFETY, UNIVERSITY OF PORT HARCOURT,PORT HARCOURT, NIGERIA); Dr ABDELMOURHIT, Laissaoui (CENTRE NATIONAL DE L ENERGIE,DES SCIENCE ET DES TECHNIQUES NUCLEAIRES (CNESTEN) ,RABAT, MOROCCO)

Presenter: OMOKHEYEKE, Omorotionmwan (CENTRE FOR MARINE POLLUTION MONITORING AND SEAFOOD SAFETY ,UNIVERSITY OF PORT HARCOUR, NIGERIA)

Session Classification: Session 11B: Posters: Nuclear Applications