ABSTRACT
SEDIMENTATION RATES IN MANILA BAY THRU SPACE AND TIME: FOCUS ON RADIOGENIC PARAMETERS

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Lead-210 (210Pb) analysis was employed to gain an insight on varying sedimentation processes occurring in Manila Bay. To reflect a more realistic sedimentation rate estimate, detailed 210Pb analysis was done on two sediment cores and the CIC (Constant Initial 210Pb Concentration) variant and CF (Constant 210Pb Flux) model were applied. Additionally, data from previous work were combined to generate spatial maps of excess 210Pb (210Pbex) surface concentrations and sedimentation rate estimates. 210Pbex concentrations show low surface activity in the Pampanga Bay area, which could be attributed to the attenuation of the atmospheric 210Pb signal by voluminous amount of sediments coming from Pampanga River. Surface 210Pbex appears to be elevated in areas with high organic fractions (area off Cavite), and in areas with fine sediments (coastal areas off Bataan). Spatial variation of sedimentation rates was established from CIC-derived sedimentation rates with additional 210Pb data from previous work. Discrepancy between the pre- and post-Pinatubo sedimentation rates is at least twice to an order of magnitude higher from ca. 1981 to ca. 1991 in Pampanga Bay and the central portion of Manila Bay. The increase in sedimentation rates maybe attributed to the elevation of sediment yield of rivers following the Mt. Pinatubo eruption in 1991. The CIC variant model makes I appear that during ca. 1981 and ca. 1991, more materials from river channels were likely transported to the central bay area than to areas closer to the river channels. However, the CF model suggests otherwise. During ca. 2001, both CIC and CF models concur that more materials were being transported near the bayhead area than the central portion of Manila Bay. The CF model addresses the effects of compaction thus offering a more realistic estimate of sedimentation rate variation than the CIC model. A possible lag response of sediment accumulation rates with rainfall data is indicated by the data; ca. 3 years nearshore and ca. 5 years for the central parts of the bay. The observed overall increase in sediment accumulation rate with time could be due to continued urban sprawls, declining mangrove cover, reduction of floodplain area due to conversion to fishponds, and rising sea level.