

Abstract

We estimated the environmental concentration of radiocesium (^{137}Cs and ^{134}Cs) emitted by the 2011 accident at the Fukushima Daiichi Nuclear Power Station in Tokyo Bay in 2012 and 30 years later (2042) using the Risk Assessment Model for Tokyo Bay (AIST-RAMTB). We used measurement results for radiocesium obtained at the estuaries of Arakawa and Edogawa Rivers and the atmospheric deposition flux for the atmospheric and riverine inputs. The spatial trends of the estimation results closely agreed with those of the measurement results, but the estimated values were only approximately 60% of the measurement values obtained for sea water and approximately one-tenth the measurement values obtained for sediment. The reproducibility of AIST-RAMTB was improved when the riverine input was double the estimated value, and when the coefficients for ^{137}Cs and ^{134}Cs were 4.5 and 4.8, respectively; this distributed the ratio of adsorbed radiocesium to dissolved radiocesium. Using the concentration of ^{137}Cs in sediment obtained using the AIST-RAMTB for the estimation in 2042 indicated a decrease in the concentration of ^{137}Cs in sediment to 13% of the 2012 value. In particular, the high concentration of ^{137}Cs at the estuary of Arakawa River in 2012 was predicted to decrease to 10 Bq/kg-dry by 2042.