

Yankovich et. al. An international model validation exercise on radionuclide transfer and doses to freshwater biota JRP

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Under the International Atomic Energy Agency (IAEA)'s EMRAS (Environmental Modelling for Radiation Safety) programme, activity concentrations of ^{60}Co , ^{90}Sr , ^{137}Cs and ^3H in Perch Lake at Atomic Energy of Canada Limited's Chalk River Laboratories site were predicted, in freshwater primary producers, invertebrates, fishes, herpetofauna and mammals using eleven modelling approaches. Comparison of predicted radionuclide concentrations in the different species types with measured values highlighted a number of areas where additional work and understanding is required to improve the predictions of radionuclide transfer. For some species, the differences could be explained by ecological factors such as trophic level or the influence of stable analogues. Model predictions were relatively poor for mammalian species and herpetofauna compared with measured values, partly due to a lack of relevant data. In addition, concentration ratios are sometimes under-predicted when derived from experiments performed under controlled laboratory conditions representative of conditions in other water bodies.

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