Brown et al. Biological transfer of radionuclides in marine environments RP 40

Brown, J.E., Børretzen, P. & Hosseini, A. 2005.
Biological transfer of radionuclides in marine environments - identifying and filling knowledge gaps for environmental impact assessments.
Radioprotection, Suppl. 1, 40, pp. S533-539.

Methodologies have been developed to allow impacts of ionising radiation on marine ecosystems to be evaluated within selected geographical settings. The stages in the assessment require initial information about unit concentrations of radionuclides in reference media to be collated. Activity concentrations for reference groups of flora and fauna and for representatives of these groups are then derived using an equilibrium concentration factor approach. Following this, dose-rates can be calculated using relevant dose conversion factors. Impacts on the environment are evaluated by comparison with dose-rates at which selected biological effects are known to occur and the natural radiation background. This paper focuses mainly on the transfer part of the assessment drawing attention to gaps in information that have been identified through review and providing an outline of methods that may be used to fill these gaps. Biokinetic models parameterised using allometric relationships have shown their utility in this respect. Initial work looking into the application of such models has met with some success with model predictions comparing favourably with the few empirical data available. Further work will be needed to validate the models for a large range of radionuclides and to consider uncertainty in model estimates through probabilistic analyses.

http://dx.doi.org/10.1051/radiopro:2005s1-078