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A framework for protection of the environment is likely to require a methodology for assessing dose rates arising from naturally occurring radionuclides. This paper addresses this issue for European aquatic environments through a process of (a) data collation, mainly with respect to levels of radioactivity in water sediments and aquatic flora and fauna, (b) the use of suitable distribution coefficients, concentration factors and global data where data gaps are present and (c) the utilisation of a reference organism approach whereby a finite number of suitable geometries are selected to allow dose per unit concentration factors to be derived and subsequent absorbed dose calculations (weighted or unweighted) to be made. The majority of the calculated absorbed dose, for both marine and freshwater organisms, arises from internally incorporated alpha emitters, with 210Po and 226Ra being the major contributors. Calculated doses are somewhat higher for freshwater compared to marine organisms, and the range of doses is also much greater. This reflects both the much greater variability of radionuclide concentrations in freshwater as compared to seawater, and also variability or uncertainty in concentration factor values. This work has revealed a number of substantial gaps in published empirical data especially for European aquatic environments.

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