

A CASE STUDY IN THE CHERNOBYL EXCLUSION ZONE - PART I: TESTING OUR ABILITY TO PREDICT RADIONUCLIDE TRANSFER TO WILDLIFE

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In recent years, national and international programmes have proposed a number of frameworks and methodologies to assess the protection of wildlife from ionising radiations. Whilst some of these are now being used by national authorities, there has been little attempt to rigorously test their predictions against available data. In part this is because of the lack of sites where radiation induced effects can be observed. One such site is the Chernobyl exclusion zone for which a considerable amount of data are available for a wide range of biota across a gradient of exposure rates. This allows predictions of assessment frameworks, from exposure through to effects, to be thoroughly tested.

In this paper we spatially implement terrestrial radionuclide transfer models developed within the EC FP5 project FASSET and test predictions of radionuclide activity concentrations in biota against compiled databases. More than 700 measurements of radionuclide activity concentrations in wild animals made throughout the exclusion zone between 1988 and 2000 are available. These include 8 species of predominantly large mammals and 13 bird species. This is supplemented by approximately 900 measurements of plant components representing the diets of the herbivorous animals sampled. On the basis of comparisons of predicted and observed activity concentrations in this wide range of biota, recommendations for improving the existing transfer models are made.

In a second paper we consider predictions of dose and radiation induced effects and compare these to data from the exclusion zone.