

Original

Analysis of Ambient-dose-rate Trends in Fukushima —Ecological Half-life, Effect of Snow Covering—

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Summary

After the Fukushima Daiichi Nuclear Power Plant (NPP) accident in March 2011, environmental radiation monitoring works have been continuously conducted throughout the Fukushima prefecture of Japan. In this study, five-year transitions of ambient dose rates at 15 locations 20–60 km away from the NPPs were precisely analyzed to investigate their chronological change. Measured dose rates were successfully fitted into a function consisting of a factor reflecting the physical decay of radiocesium and the other component such as the weathering effect. The ecological half-lives derived from the function ranged from 3 to 27 years (average 10 years). The radiation shielding effect by snow covering was also studied with the obtained functions. Due to the effect, dose rates were lowered by 15–50% by 20-cm-deep snow covering, and the ambient doses integrated over the five years were found to decrease by up to 7% compared to those without the snow covering that can be predicted from the fit function.

Key Words: Fukushima Daiichi Nuclear Power Plant accident, Radiation monitoring, Radiocesium, Ecological half-life, Decontamination, Snow covering
