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## Methods for marine ecological risk assessment of radioactive accidents

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Ecological risk assessment (ERA) is a powerful technical tool to analyze potential and extreme adverse environmental impacts. With the rapid growth of nuclear power plants in the coastal areas around the world, radioactive pollution caused by nuclear accidents become the most important issue in marine and coastal environmental protection. The approaches and methodology of marine ERA for radiation accident are in urgent for marine environmental management. In this study, the approaches and methods for ERA of marine radioactive accidents (MRA) are summarized and discussed. The concept of ERA-MRA is defined. The concept of the grading of risk levels (risk degree) and their criteria are proposed for the expression of risk characterization to semi-quantitatively present risk magnitude, determine the harmful extent of risk and support risk management. Based on literature review, the classic ERA approach, Grade approach and ERICA integrated approach were selected to apply into case studies, Fukushima nuclear accident in Japan, 2011 and imaginary accident of Daya Bay Nuclear Power Plant in China for early and later stage of MRA, respectively. The results of case studies show that the assessment approach and methodology for ERA-MRP are scientifically effective. The classic ERA approach and ERICA integrated approach are finally chosen to set up a system for the early and later stage of ERA-MRP, respectively. The system is helpful to support decision-making and management processes in the beginning of events against accident and support ecological restoration after events. In the early stage of nuclear accident, more attention should be pay to the acute exposure in seawaters and then to the chronic risk from sediment in the late stages of accident.

### Biography

Sufen Ye is currently pursuing her PhD in Marine Affairs Program of Xiamen University in China. She has her expertise in ecological risk assessment, especially for marine radioactive accidents. She has completed her Bachelor's degree of Environmental Science and Bachelor's degree of Economics as well as a Master's degree of Marine Affairs in Xiamen University. Her main research area is ecosystem evaluation. She has published two papers about fine particles from cooking fumes related to air pollution and one review paper on ecological risk assessment for marine radioactive pollution.

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