

## **Analysis of plants and sediments from the tidelands of the coastal regions of the Tohoku district following the 2011 tsunami**

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### **Abstract**

The tidelands (tidal flats) of the seaside district of Tohoku, Japan, which play an important role in maintaining the diversity of the marine ecosystem, were almost completely destroyed by the massive tsunami that occurred on March 11, 2011. The tsunami also brought large quantities of contaminated sludge from the bottom of the sea to the coastal lands including the tidelands. In this study, we collected sludge samples from three tidelands: the Tsugaruishi estuary tideland (Iwate pref.), the Orikasa estuary tideland (Iwate pref.), and the Gamou tideland (Miyagi pref.). We then analyzed the samples using PIXE in accordance with a powdered-internal-standard method that we developed. In order to investigate the effects of the contaminated sludge on the ecosystem, we gathered and analyzed various kinds of wild plants and seaweed. We found that the tidelands are contaminated with heavy elements, such as arsenic, lead, zirconium, and barium, although the contamination is less serious in the vicinity of the beach.