

## Salinization and heavy metal contamination in Tsunami disaster area

Shin-ichi Onodera<sup>1\*</sup>, Ichiro Kaihotsu<sup>1</sup>, Koki Onishi<sup>2</sup>, KIYOSHI SAIJO<sup>3</sup>, Mitsuyo Saito<sup>4</sup>

<sup>1</sup>Integrated Sciences, Hiroshima University, <sup>2</sup>Fukken Co., <sup>3</sup>Miyagi Education University, <sup>4</sup>Ehime University

Tsunami caused instantaneously the supply of seawater and sediment deposited on the sea bed to the coastal land. That is a sudden interaction of land and sea. But its effect would continue for a long period. It is an important issue for our water and land resources. For managing and conserving the water resources and agricultural lands in Tsunami disaster area, we aim to confirm salinization and heavy metal contaminations from surface soil to groundwater. We conducted soil and water collections in around Sendai and Minami-Sanriku of Miyagi prefecture and Rikuzen-Takada and Kamaishi of Iwate Prefecture in June and September of 2011 and August of 2012.

We observed the saline crust on the land surface at the each place of Tsunami disaster area. Our observation of a surface soil from the coastal line to the edge of a Tsunami reach in southern Sendai indicated the exponential decline of saline content and the recovery of salinization for the three months from June to September. But the saline content at the most coastal plot increased, because saline accumulation occurred probably by the evaporation. On the other hand, groundwater was rapidly in terms of the recovery.

The chloride concentration at the surface soil from the ground surface to the depth of 1 cm has highest at the most plots in August in 2012. We observed the deposition of marine sand with the thickness of 15 cm above the original ground surface at the plot in Kamaishi. This saline content was highest in the all plots and the twice of sea content. In addition, we detected the higher heavy metal concentration than the water quality standard. Especially, the manganese and copper were detected higher concentration than it at the surface soil of the every plots. We should notice to manage the surface soil as the contamination potential and to conserve the groundwater resources and agricultural soil.

Keywords: Tsunami, disaster, salinization, heavy metal pollution, groundwater