Reconnaissance survey of activity concentrations and runup following the 11 March 2011 Japan tsunami.

This is an opportunistic survey to take advantage of a substantial effort to film a documentary in Northern Japan with substantial tsunami impact. The PI and colleagues had visited the area following the 11 March 2011 Tohoku tsunami and recorded runup and tsunami currents. They also took soil and water samples, which in a few instances suggested activity concentrations one order of magnitude higher than reported by others. The field survey will focus on revisiting these areas and obtaining new samples, which when decay corrected to the earlier survey dates will allow validation of the earlier findings. It will also attempt to fill gaps in the runup data in Saipan, Tinian and Rota not filled by earlier surveys. The latter are particularly important to help benchmark inundation maps produced by NOAA.

On Friday, 11 March 2011, at 14:46 JST (05:46 UTC) an M—9.0 earthquake, occurred in northern Honshu, Japan. The earthquake triggered a catastrophic near field tsunami killing 24,769 people. The main and auxiliary power of the Fukushima Daiichi Nuclear Power Plant (NPP) were destroyed. On 15 March 2011 an explosion released gases with radioactive nuclei.

An earlier NSF RAPID that focused on measuring inundation heights and currents (Fritz et al, 2012) also collected topsoil and water samples. Endo, et al., (2011) estimated the $^{131}\text{I}$ concentration in soil in Miyagi Prefecture (Kawauchi ES) to be 14,000.1 Bq/kg. When decay-corrected our sample 4 to 17:00 on 15 March 2011, we estimate that the activity concentration would have been 22,047 Bq/kg, just after the explosion. We observed the highest $^{134}\text{Cs}$ topsoil concentration 38,430 ± 450 Bq/kg, (sample No7) in Uoichibamae, Kesennuma. Endo, et al., (2011) estimated the $^{134}\text{Cs}$ concentration in soil in Miyagi Prefecture be 1,000.08 Bq/kg when decay-corrected to 17:00 on 15 March 2011, which is about 38 times lower than our Sample No 7. The highest $^{137}\text{Cs}$ soil concentration we observed was again in Uoichibamae, with a topsoil concentration of 43,730 ± 850 Bq/kg (sample No 7). Endo, et al., (2011) estimated the $^{137}\text{Cs}$ concentration in soil in Miyagi Prefecture to be 1,260 Bq/kg, when decay-corrected to 17:00 on 15 March 2011, about 40 times lower than what we observed in this locale.

Taking the opportunity of the return of the PI to Japan for filming a documentary, the PI would like to take one undergraduate student along to collect topsoil samples from the same and adjacent areas where samples were collected in April 2011. With decay-corrections, it will be possible to validate the earlier measurements for Cs; I has a far shorter half-life. We will focus on topsoil sampling, water is likely to have mixed in the intervening 14 months. We will also conduct field surveys of Saipan, Tinian and Rota. We would like to find the eyewitnesses, measure the runup and record their observations. The results will not only help complete existing data bases of runup measurements, but they will also provide benchmark data for validating tsunami inundation maps produced by NOAA for the CNMI.