

Revisiting radionuclide sources at the Marshall Islands

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A new research effort was launched to sample the lagoon, groundwater and seafloor near the nuclear weapons testing sites on the Bikini and Enewetak atolls. Particular effort was



spent sampling both contaminant radionuclides such as cesium-137, as well as the naturally occurring radium isotopes, the later being an indicator of submarine ground water discharge (SGD). Samples were collected in January 2015 from the M/V Alucia. Using a balance of measured levels in the lagoon water and SGD, we can estimate the strength of ongoing sources such as the Runit dome on Enewetak, and near the larger craters left by the Mike and Bravo tests. We can also use the seafloor cores to compare inventories and isotope ratios in the lagoon waters vs. the sediments. Comparisons to prior studies will also be informative to revisit the longstanding issue of radionuclide mobilization from the sediments. Past studies have shown elevated levels for example of plutonium in the lagoon, which can only be maintained by mobilization of sedimentary Pu. Using plutonium isotopes (to be analyzed on a future date), we will be able to pin point sources from specific tests in these lagoons vs. global fallout. We also tested an autonomous surface vehicle for the collection of cesium samples that might be deployed for more regular monitoring of legacy sites such as these, or in response to accidents such as Fukushima. This report will summarize work to date on the different sample types and collection systems deployed on this cruise.