

Radiation levels on Bikini Atoll found to exceed safety standard

June 7 2016, by Bob Yirka



Bikini Island, 2015. Credit: Emlyn Hughes

(Phys.org)—A team of researchers from Columbia University in New York has found that all of the Marshall Islands involved in nuclear tests by the U.S. are now habitable, except for Bikini Atoll. In their paper

published in *Proceedings of the National Academy of Sciences*, the team describes the reasoning for their testing, the methods they used, their results and what they believe should be done going forward.

As most everyone knows, the United States embarked on an ambitious nuclear arms program beginning during the closing days of World War II. Testing was done at various sites, one of which involved the northern Marshall Islands. In all the U.S. detonated 67 nuclear devices in the area between the years 1946 to 1958. To make the site ready for testing, inhabitants of the [islands](#) were moved to other islands—but now, as time has passed, those people and their descendants, wish to return. But before that can happen, the impacted islands must be deemed safe. But, the researchers with this new effort contend, the government of the Marshall Islands has been relying on outdated information. No on the ground survey of gamma radiation has been conducted over the past several decades.

To remedy that situation, the team flew to the Marshal Islands and conducted [gamma ray emission](#) surveys on three of the atolls most impacted by the [nuclear tests](#), and compared their readings with an island (Majuro Atoll) distant enough from the blast zone to be used as a control, it showed 13 millirems of radiation per year. For further illustration purposes, the team also took readings in New York's Central Park, which showed 9 mrem/y.

The researchers report that they found readings on Enewetak Atoll to be 7.6 mrem/y, and on Rongelap to be 19.8 mrem/y, both of which fall in the safe zone. Readings on Bikini Atoll, on the other hand were 184 mrem/y, which is not considered terribly dangerous, but it does exceed the minimum acceptable levels agreed upon by the U.S. and the government of Marshall Islands—also the researchers point out, more study needs to be done on Bikini Atoll to ascertain what sorts of exposure people living on the island might be exposed to, e.g. through

the food they eat, before any talk of re-habitation can begin.

More information: Autumn S. Bordner et al. Measurement of background gamma radiation in the northern Marshall Islands, *Proceedings of the National Academy of Sciences* (2016). [DOI: 10.1073/pnas.1605535113](https://doi.org/10.1073/pnas.1605535113)

Abstract

We report measurements of background gamma radiation levels on six islands in the northern Marshall Islands (Enewetak, Medren, and Runit on Enewetak Atoll; Bikini and Nam on Bikini Atoll; and Rongelap on Rongelap Atoll). Measurable excess radiation could be expected from the decay of ^{137}Cs produced by the US nuclear testing program there from 1946 to 1958. These recordings are of relevance to safety of human habitation and resettlement. We find low levels of gamma radiation for the settled island of Enewetak [mean = 7.6 millirem/year (mrem/y) = 0.076 millisievert/year (mSv/y)], larger levels of gamma radiation for the island of Rongelap (mean = 19.8 mrem/y = 0.198 mSv/y), and relatively high gamma radiation on the island of Bikini (mean = 184 mrem/y = 1.84 mSv/y). Distributions of gamma radiation levels are provided, and hot spots are discussed. We provide interpolated maps for four islands (Enewetak, Medren, Bikini, and Rongelap), and make comparisons to control measurements performed on the island of Majuro in the southern Marshall Islands, measurements made in Central Park in New York City, and the standard agreed upon by the United States and the Republic of the Marshall Islands (RMI) governments (100 mrem/y = 1 mSv/y). External gamma radiation levels on Bikini Island significantly exceed this standard ($P =$

Citation: Radiation levels on Bikini Atoll found to exceed safety standard (2016, June 7) retrieved 27 April 2024 from <https://phys.org/news/2016-06-bikini-atoll-safety-standard.html>

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