True facts about ocean radiation and the Fukushima disaster

January 7, 2014, by Kim Martini, Ph.D., 90 Comments

On March 11th, 2011 the Tōhoku earthquake and resulting tsunami wreaked havoc on Japan. It also resulted in the largest nuclear disaster since Chernobyl when the tsunami damaged the Fukushima Daiichi Nuclear Power Plant. Radioactive particles were released into the atmosphere and ocean, contaminating groundwater, soil and seawater which effectively closed local Japanese fisheries.

Rather unfortunately, it has also led to some wild speculation on the widespread dangers of Fukushima radiation on the internet. Posts with titles like "Holy Fukushima – Radiation From Japan Is Already Killing North Americans" and "28 Signs That The West Coast Is Being Absolutely Fried With Nuclear Radiation From Fukushima" (which Southern Fried Science has already throughly debunked) keep popping up on my facebook feed from well-meaning friends.

I'm here to tell you that these posts **are just plain garbage**. While there are terrible things that happened around the Fukushima Power Plant in Japan; Alaska, Hawaii and the West Coast aren't in any danger. These posts were meant to scare people (and possibly written by terrified authors). They did just that, but there is a severe lack of facts in these posts. Which is why I am here to give you the facts, and nothing but the facts.

WHAT WAS RELEASED INTO THE OCEAN AT FUKUSHIMA?

The radioactive rods in the Fukushima power plant are usually cooled by seawater [CORRECTION: they are usually cooled by freshwater. As a last ditch emergency effort at Fukushima seawater was used as a coolant.]. The double whammy of an earthquake and a tsunami pretty much released a s**tstorm of badness: the power went out, meltdown started and eventually the radioactive cooling seawater started leaking (and was also intentionally released) into the ocean. Radioactive isotopes were also released into the air and were absorbed by the ocean when they rained down upon it. These two pathways introduced mostly Iodine-131, Cesium-137, and Cesium-134, but also a sprinkling

of Tellurium, Uranium and Strontium to the area surrounding the power plant.

There aren't great estimates of how much of each of these isotopes were released into the ocean since TEPCO, the company that owns the power plant hasn't exactly been forthcoming with information, but the current estimates are around 538,100 terabecquerels (TBq) which is above Three-Mile Island levels, but below Chernobyl levels. And as it turns out, they recently found contaminated groundwater has also started leaking into the sea. TEPCO, the gift that keeps on giving.

WHAT'S A BEQUEREL? WHAT'S A SIEVERT?

Units of Radiation are confusing. When you start reading the news/literature/blogs, there are what seems like a billion different units to explain radiation. But fear not, I've listed them below and what they mean (SI units first).

Becquerel[Bq] or Curie[Ci]: radiation emitted from a radioactive material (1 Ci = 3.7×10^{10} Bq)

Gray [Gy] or Rad[rad]: radiation absorbed by another material (1Gy = 100 rad)

Sieverts[Sv] or "roentgen equivalent in man"[rem]*: how badly radiation will damage biological tissue (1 Sv = 100 rem)

You can convert from Grays and Rads to Rem and Sieverts, but you

have to know what kind of radiation it is. For example alpha radiation from naturally occurring Polonium-210 is more damaging to biological tissues than gamma radiation from Cesium-137. Even if you absorbed the same number of Grays from Cesium or Polonium, you would still effectively receive more damaging radiation from Polonium because the number of Sieverts is higher for Polonium than Cesium. And kids, Sieverts and Seavers are both dangerous to your health but please don't confuse them.

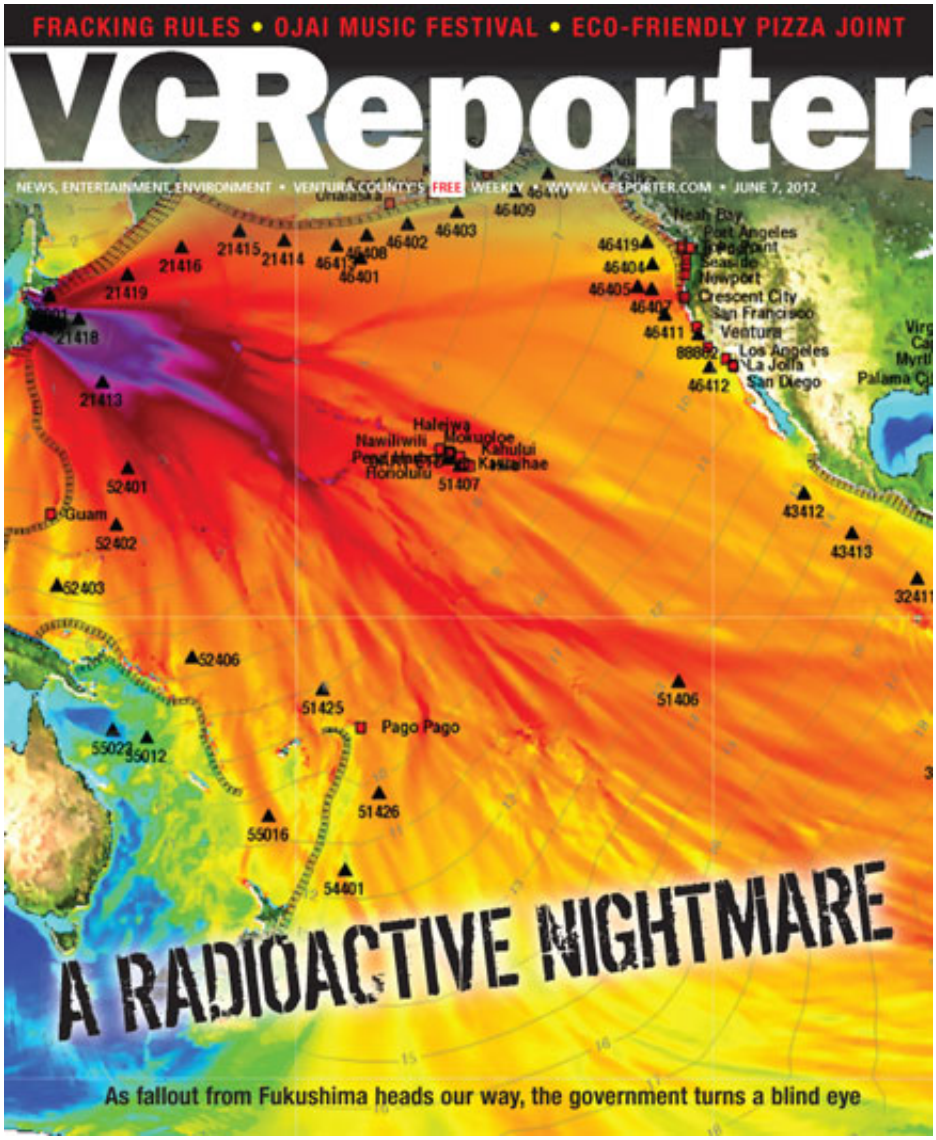
WHAT'S CESIUM-137?

Cesium-137 is product of nuclear fission. Before us humans, there was no Cesium-137 on earth. But then we started blowing stuff up with nuclear bombs and VOILA!, there are now detectable, but safe, levels of Cesium-137 in all the world oceans.

WHAT DO THE MAPS OF FUKUSHIMA RADIATION IN THE PACIFIC REALLY TELL US?

There are a bunch of maps being thrown around on the internet as evidence that we are all going to die from Fukushima radiation. I'm going to dissect them here. Apologies in advance for dose of snark in this section because some of these claims are just god awful. Spoiler: radiation probably has reached the West Coast but it's not dangerous.

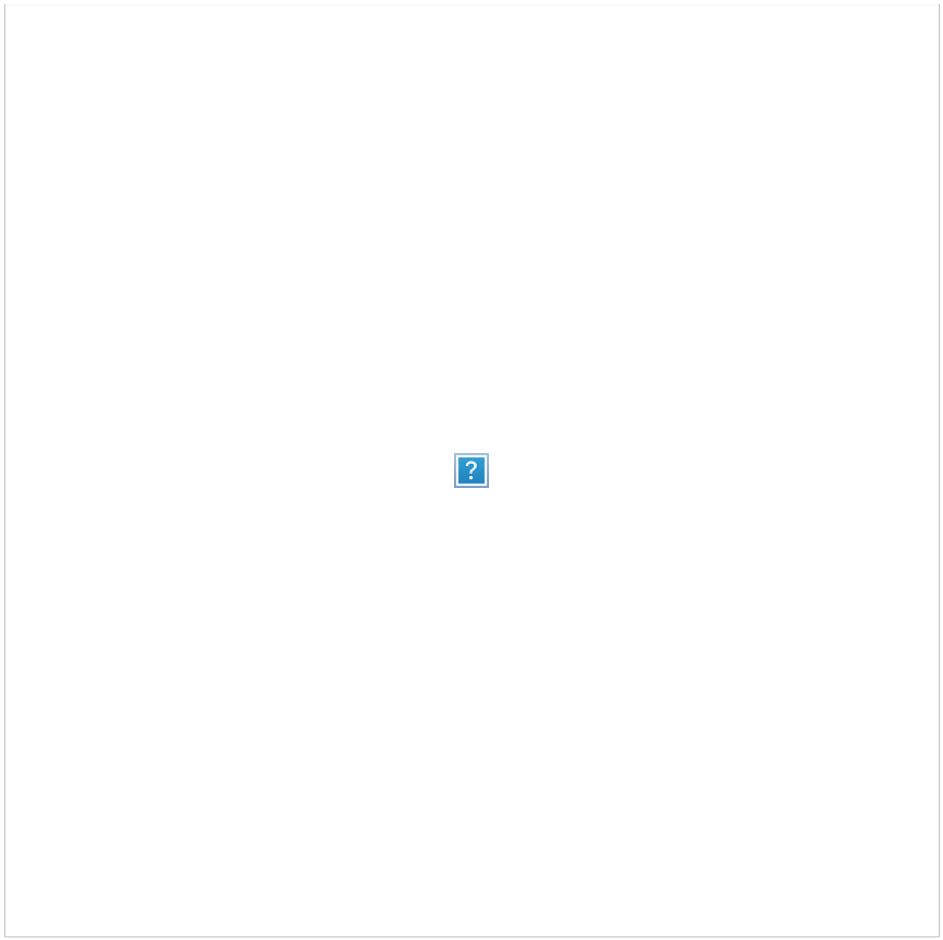
MAP OF TERROR #1: The Rays of Radioactive Death!



[source: http://www.enviroreporter.com/investigations/fukushima/a-radioactive-nightmare/]

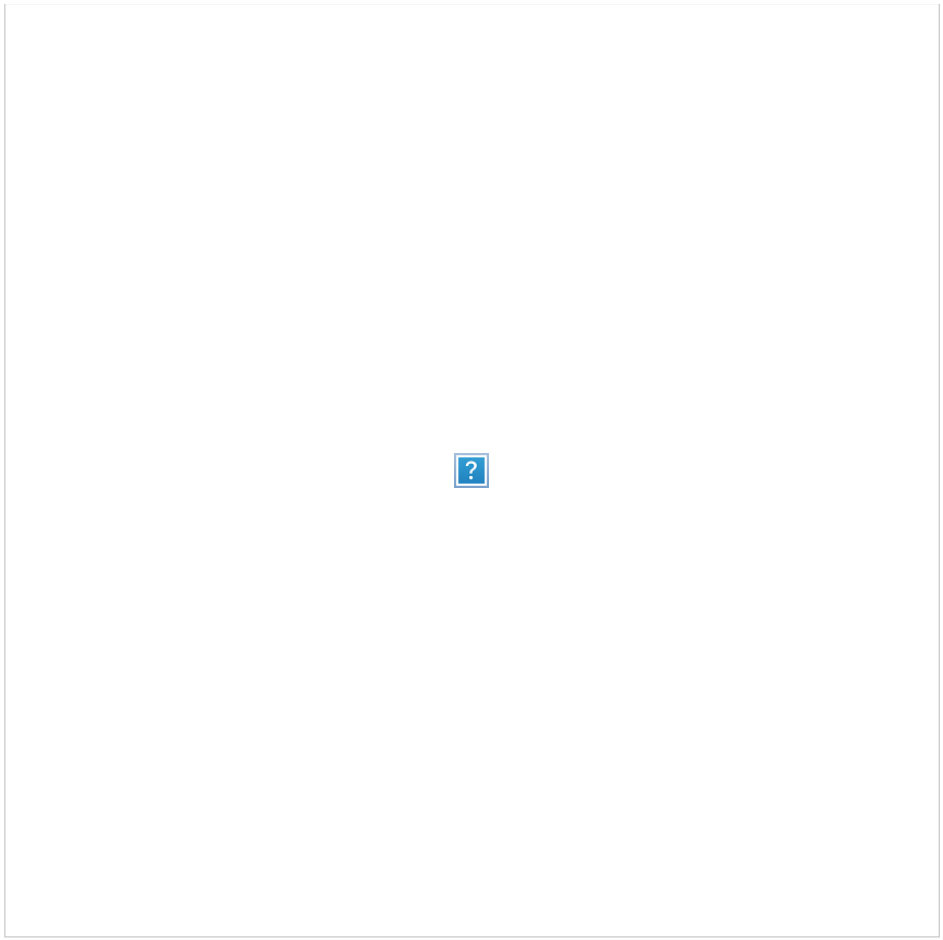
This is not a map of Fukushima Radiation spreading across the Pacific. This is a map of the estimated maximum wave heights of the Japanese Tohuku Tsunami by modelers at NOAA. In fact, tsunamis don't even transport particles horizontally in the deep ocean. So there is no way a Tsunami could even spread radiation (except maybe locally at scales of several miles as the wave breaks onshore). Dear VC reporter, I regret to inform you this cover image could be the poster child for the importance of journalistic fact-checking for years to come.

MAP OF TERROR #2: EHRMAGHAD
radioactive SPAGHATTA NADLES attack Hawaii!



I mean I guess this is a bit better. At least this map used an ocean model that actually predicts where radioactive particles will be pushed around by surface ocean currents. But it still gets a BIG FAT FAIL. The engineering company that put this image/piece of crap out there couldn't even be bothered to put a legend on the map. Their disclaimer says "THIS IS NOT A REPRESENTATION OF THE RADIOACTIVE PLUME CONCENTRATION." Then what do the colors mean?

MAP OF TERROR #3: THE BLOB!



It's true, oceanographic models have shown that radiation from Fukushima has probably already hit Aleutians and Hawaiian Island chain, and should reach the California Coast by Fall 2014 [Beherns et al. 2012]. The map above is showing the spread of Cesium-137 from the Fukushima reactor would look like right now, I mean radiation is apparently EVERYWHERE! But what is missing from most of the discussion of these maps is what the colors ACTUALLY mean.

We shall now seek guidance from the little box in the upper right hand corner of the map called the legend**. The colors show ~~how much less radioactive the~~ the decrease in the radioactive concentrations of Cesium-137 isotopes ~~have become~~ since being emitted from Fukushima. For example, the red areas indicate the Fukushima Cesium-137 is now more than 10,000 times less ~~radioactive~~ concentrated than when released. The California Coast, more than a million times less. The punchline is that overall concentrations of radioactive isotopes and therefore radioactivity in the Pacific will increase from Pre-Fukushima levels, but it will be way less than what was seen in coastal Japan and definitely not enough to be harmful elsewhere (we'll get to more of that later).

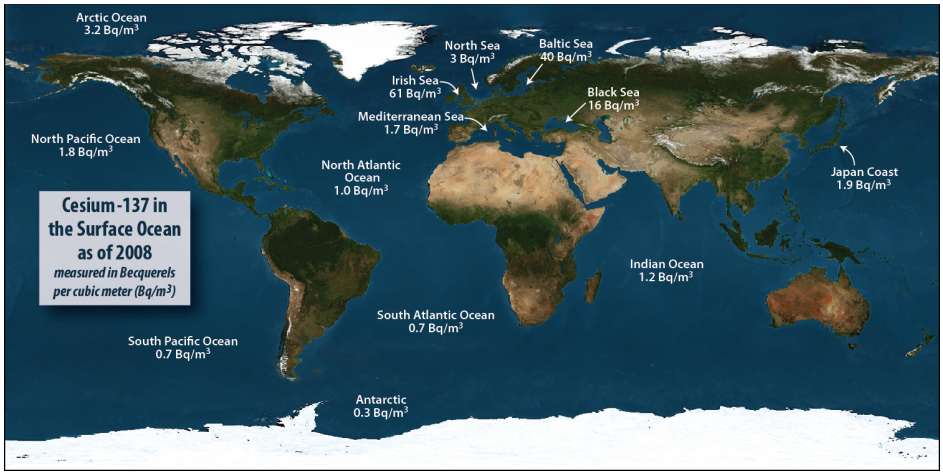
** As Eve Rickert has thoughtfully pointed out, my description of the image is a little confusing. I've added corrections in blue to clarify.

HOW MUCH RADIATION WILL REACH THE WEST COAST?

Practically, what does ten thousand or a million times less radiation mean? It means that these models estimate the West Coast and the Aleutians will see radiation levels anywhere from 1-20 Bq/m^3,while Hawaiian Islands could see up to 30 Bq/m^3 [Beherns et al. 2012, Nakano et al. 2012, Rossi et al. 2013].

I could write a small novel explaining why the numbers differ between the models. For those that love the details, here's a laundry list of those differences: the amount of radiation initially injected into the ocean, the length of time it took to inject the radiation (slowly seeping or one big dump), the physics embedded in the model, the background ocean state, the number of 20-count shrimp per square mile (Just kidding!), atmospheric forcing, inter-annual and multi-decadal variability and even whether atmospheric deposition was incorporated into the model.

Like I said before, the West Coast will probably not see more than 20 Bq/m^3 of radiation. Compare these values to the map of background radiation of Cesium-137 in the ocean before Fukushima (from 1990). Radiation will increase in the Pacific, but it's at most 10 times higher than previous levels, not thousands. Although looking at this map I would probably stop eating Baltic Herring fish oil pills and Black Sea Caviar (that radiation is from Chernobyl) before ending the consumption of fish from the Pacific Ocean.



[source: http://www.whoi.edu/page.do?pid=83397&tid=3622&cid=94989]

WILL THE RADIATION REACHING THE WEST COAST BE DANGEROUS?

No it will not be dangerous. Even within 300 km of Fukushima, the additional radiation that was introduced by the Cesium-137 fallout is still well below the background radiation levels from naturally occurring radioisotopes. By the time those radioactive atoms make their way to the West Coast it will be even more diluted and therefore not dangerous at all.

It's not even dangerous to swim off the coast of Fukushima. Buessler et al. figured out how much radiation damage you would get if you doggie paddled about Fukushima (Yes, science has given us radioactive models of human swimmers). It was less than 0.03% of the daily radiation an average Japanese resident receives. Tiny! Hell, the radiation was so small even immediately after the accident scientists did not wear any special equipment to handle the seawater samples (but they did wear detectors just in case). If you want danger, you're better off licking the dial on an old-school glow in the dark watch.

CAN I EAT FISH FROM THE PACIFIC?

For the most part the answer is YES. Some fisheries in Japan are still closed because of radioactive contamination. Bottom fish are especially prone to contamination because the fallout collects on the seafloor where they live. Contaminated fish shouldn't be making it to your grocery store, but I can't guarantee that so if you are worried just

eat fish from somewhere other than Japan.

Fish from the rest of the Pacific are safe. To say it mildly, most fish are kinda lazy. They really don't travel that far so when you catch a Mahi Mahi off the coast of Hawaii its only going to be as contaminated as the water there, which isn't very much.Hyperactive fish, such as tuna may be more radioactive than local lazy fish because they migrate so far. As Miriam pointed out in this post, there is a detectable increase of radiation in tuna because they were at one point closer to Fukushima, but the levels are not hazardous.

To alleviate fears that you may be glowing due to ingestion too many visits to your local sushi joint, Fischer et al. figured out exactly how much damaging radiation you would receive from eating a tower of tuna rolls. Seriously. Science is just that awesome. Supermarket tuna hunters would receive 0.9 μSv of radiation, while the outdoors subsistence tuna hunter would receive 4.7 μSv. These values are about the same or a little less than the amount a person receives from natural sources.

To put 0.9 μSv of radiation in perspective check out this awesome graph of radiation by xkcd. You'll get the same amount of radiation by eating 9 bananas. Monkeys might be doomed, but you are not.

I EAT PACIFIC FISH AND SO CAN YOU!

I hope this list of facts has answered most of your questions and convinced you the Pacific and its inhabitants will not be fried by radiation from Fukushima. I certainly feel safe eating sustainable seafood from the Pacific and so should you. If you are still unsure, please feel free to ask questions in the comments section below.

UPDATE #1: CONTRIBUTIONS FROM GROUNDWATER LEAKS

There's been a lot of discussion in the comments about the contribution from the groundwater leaks. I did some homework and here's what I came up with. (Also thanks to everyone for the interesting discussions in the comments!)

The ground water leaks are in fact problematic, but what has been released into the ocean is MUCH less than the initial release (although I admit the groundwater itself has extremely high radiation levels). The estimates from Jota Kanda are that 0.3 TBq per month (10^{12} Bq) of contaminated groundwater is leaking into the ocean, which has added another 9.6 TBq of radiation into the sea at most. The initial releases were about 16.2 PBq (10^{15} Bq), about 1500 times more radiation. With this in mind, the additional radioactivity leak from ground water isn't a relatively large addition to the ocean.

The models by Behrens and Rossi used initial source functions of 10 PBq and 22 PBq, which is on par with the most recent estimates. Since their models used a much higher source function, that says to me that this relatively smaller input from groundwater still won't raise the radioactivity to dangerous levels on the West Coast, Alaska and Hawaii. Recent observations around Hawaii by Kamenik et al. also suggest that the models may have even overestimated the amount of radiation that hit Hawaii, which is good news.

But there are caveats to this information as well. The leaking groundwater contains strontium and tritium which are more problematic than Cesium-137. But it sounds like strontium accumulates in bones and is only problem if you eat small fish with the bones in, like sardines (and it will only affect sardines caught near Japan since they don't travel far). I suspect there might be some precedent for understanding the dangers of tritium in seawater from the 20th century nuclear testing in atolls, but I really don't know. There is also 95 TBq of radioactive cesium is in the sediment around Fukushima, which is still super problematic for bottom dwelling fish and therefore local Japanese Fisheries. Lastly, another source is terrestrial runoff. These numbers haven't been quantified but they are probably minor because they contain a fraction of the total deposition from atmospheric fallout, which itself was a fraction of what was released into the ocean.

So even with the new groundwater leaks, the available evidence still tells me I can eat fish from the West Coast, Hawaii, and Alaska.

http://www.nature.com/news/ocean-still-suffering-from-fukushima-fallout-1.11823

http://www.biogeosciences.net/10/6045/2013/bg-10-6045-2013.pdf

http://newswatch.nationalgeographic.com/2013/09/11/fukushima-fallout-not-affecting-u-s-caught-fish/

UPDATE #2: ANOTHER GREAT RESOURCE FOR LEARNING ABOUT THE SCIENCE OF FUKUSHIMA RADIATION

For more in depth articles about radiation from Fukushima in the ocean you should definitely check out some of Marine Chemist's Posts at Daily Kos. Written by Jay T. Cullen, a Marine Chemist at the University of Victoria, the posts walk you through the most current research on Fukushima Radiation from a variety of sources. I especially recommend his most recent post on Update on Fukushima Radionuclides in the North Pacific and Off the West Coast of North America, were he discusses the recent detection of Fukushima radiation off the coast of Canada. The most recent observations from June 2013 shows the spread of Cesium-137 was on par with the predictions by Rossi et al., but the concentrations are safe and lower than predicted.

[DISCLAIMER: The creators of the NOAA tsunami map work in my building. I secretly fangirl squeal when I walk past their offices. I recently had coffee with Joke F. Lübbecke, who also works in my building. It was caffeinated.]

*Confusingly, oceanographers also co-opted the acronym Sv for Sverdrups their unit for volume transport. 1 Sverdrup = 1 Sv = one million cubic metres per second = 400 Olympic swimming pools just passed your house in one second.

SOURCES:

Behrens, Erik, et al. "Model simulations on the long-term dispersal of 137Cs released into the Pacific Ocean off Fukushima." *Environmental Research Letters* 7.3 (2012): 034004.

Buesseler, Ken O., et al. "Fukushima-derived radionuclides in the ocean and biota off Japan." *Proceedings of the National Academy of Sciences* 109.16 (2012): 5984-5988.

Fisher, Nicholas S., et al. "Evaluation of radiation doses and associated risk from the Fukushima nuclear accident to marine biota and human consumers of seafood." *Proceedings of the National Academy of Sciences* (2013).

Nakano, Masanao, and Pavel P. Povinec. "Long-term simulations of the 137 Cs dispersion from the Fukushima accident in the world ocean." *Journal of environmental radioactivity* 111 (2012): 109-115.

Rossi, Vincent, et al. "Multi-decadal projections of surface and interior pathways of the Fukushima Cesium-137 radioactive plume." *Deep Sea Research Part I: Oceanographic Research Papers* (2013).

Woods Hole Oceanographic Institution FAQ: Radiation from Fukushima

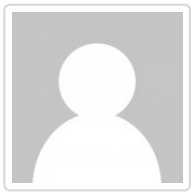
Explained: rad, rem, sieverts, becquerelsl. A guide to terminology about radiation exposure

Kim Martini, Ph.D.

Related — "Physicist: There was no Fukushima nuclear disaster"

Guest Insights

Energy ▸ *fukushima* ▸ *Japan* ▸ *nuclear power* ▸ *oceans* ▸ *radiation* ▸ *tsunami* ▸



About the Author: Kim Martini, Ph.D.

Kim is a Physical Oceanographer at the Joint Institute for the Study of Atmosphere and Ocean at the University of Washington. She received her Ph.D. from the University of Washington in 2010. Her goal in life is to throw expensive s**t in the ocean. When not at sea, she uses observations from moored, satellite and land-based instruments to understand the pathways that wind and tidal energy take from large (internal tides) to small scales (turbulence).

see more

6 • Reply • Share ›

Michael Mann • 5 months ago

The anti-nuclear pro-fossil fuel climate deniers will have a fit over you debunking their favorite scams, they count on people being ignorant and afraid. The anti-nuclear people are easy to spot, they like to call anyone with knowledge and experience "troll" or "shill" and attempt to use these memes to frighten people who don't know any better.

7 • Reply • Share ›

Arrow Durfee Michael Mann • a month ago

Below is a map of the radiation flow out of Fukushima. Find the video at the top of the article. This is why I will not longer eat seafood from the Pacific Ocean. This is a map at 2.5 years after Fukushima. We are now in year 5. Wonder how it will look 2.5 years from now. I offer the video in this link as evidence. Instead of their rhetoric consider this as you watch the film. The reactors have been leaking now for 5 years, the core is now submerged in the ocean. The core is hotter than its ever been. This is a surface water analysis..What about the deep sea? What about the oceanic plant life? What the film in this article shows us it that things are definitely dispersing and spreading through the ocean. This is scheduled to continue for the next 20,000

This is scheduled to continue for the next 20,000 years if they can't find a way to remove these cores from the ocean. So far, 5 years an no luck with that. http://iopscience.iop.org/a...

1 • Reply • Share ›

Michael Mann ➦ Arrow Durfee
• a month ago

From your link " 10 Bq m–3 during the first two years, followed by a gradual decline to 1–2 Bq m–3 over the next 4–7 years. The total peak radioactivity levels would then still be about twice the pre-Fukushima values. " 10Bq is a tiny amount of radiation and a cubic meter of water is a lot of water.. knowledge is better than fear!

5 • Reply • Share ›

TimS • 5 months ago

Greenpeace's biased anti-nuclear propaganda uses "two sets of standards":

http://www.greenpeace.org/i...
Natural radioactivity in some places on Earth are more

see more

4 • Reply • Share ›

Robert Hargraves • 3 years ago

Kim, thanks for the post. I'm also trying to counter

radiation fear, with a brochure. If you (or anyone) mails your postal address to me an I'll send some samples. Or look at http://radiation-safety-lim...

4 ▲ | ▼ • Reply • Share ›

Lisa Greene • 3 years ago

So areas around Chernobyl, after so many years, are NOW too dangerous to eat food from, but the fallout from Fukushima is ok? How stupid do you think we are? (And we won't even get into WHY they locate these facilities in such dangerous areas to begin with - near coasts, in earthquake zones, etc...)

11 ▲ | ▼ • Reply • Share ›

KumachanTokyo ↗ Lisa Greene • 3 years ago

What is dangerous around Chernobyl are eventually the small pieces of the reactor that were jettisoned with the graphite explosion. Chernobyl didn`t have any Containment Vessel as the democratic countries had at those times and this explains why the total emissions of 3 Japanese reactors are 1/6 of Chernobyl with most of it above and inside the Pacific Ocean, and if it there it`s not in Japan.
Of course there are some more contaminated zones, but what is dangerous has been restricted beyond reasoning, especially when that crazy woman of the Komiyama set the food limit to 100Bq/kg [USA 1250Bq/kg] with the result that the some of the best European fruit jams have been banned in Japan.

You put nuclear reactors where there is water to

see more

5 ▲ | ▼ • Reply • Share ›

Chew ↗ Lisa Greene • 3 years ago

The reason there is a difference between the Baltic and Pacific contamination levels is Chernobyl dumped about 14 PBq of Cs-137 into the Baltic Sea and the Baltic Sea has 31,000 less volume than the Pacific.The Baltic is separated from the Atlantic by a narrow strait so very little

water in the Baltic makes its way into the Atlantic and vice versa.

4 ▲ | ▼ • Reply • Share ›

X-45 • 3 years ago

"the total emissions of 3 Japanese reactors are 1/6 of Chernobyl" <<<<<<< This sort of comment is bordering on (if not completely) suicidal/ homicidal.

5 ▲ | ▼ • Reply • Share ›

Chew • 3 years ago

When I try to counter the doomsdayers who say Fukushima is an "Extinction Level Event" and it will wipe out all humanity I refer them to this document. See page 8 for a handy table.

http://www-pub.iaea.org/MTC...

It discusses in detail the amount of radiation dumped into the oceans from nuclear weapons testing, nuclear reprocessing, and all others causes. Fukushima is a minor contributor. When people bring up the fact that Fukushima is still leaking radioactivity into the Pacific, I tell them there is already so much Cs-137 in the Pacific from nuclear weapons testing that 700 times as much Cs-137 decays every day than what Fukushima is adding to it. In other words, the leak from Fukushima would have to be 700 times worse than it is just to maintain the amount of Cs-137 in the Pacific.

4 ▲ | ▼ • Reply • Share ›

Frank Energy ↗ Chew • 7 months ago

thats stupid. We went from around .5 to 1 Bq/M3 to range of 3 to 5 to 8 to 13

Linking to anything the IAEA says is a joke, their stated purpose is to promote nuclear, and to do that, one must lie.

▲ | ▼ • Reply • Share ›

Chew ↗ Frank Energy • 7 months ago

The IAEA link is to an inventory of nuclear weapons fallout in the oceans. But since

you couldn't even spell the first word of your reply correctly I don't expect you could even begin to understand the contents of the link so I won't waste my time with you.

6 ▲ | ▼ • Reply • Share ›

Michael Mann ➚ Chew
• 7 months ago

Frank Energy is an alias of a self promoting anti-science blogger who doesn't believe in climate change and loves irrational fear and conspiracy theories....

3 ▲ | ▼ • Reply • Share ›

Frank Energy ➚ Chew
• 7 months ago

Ah the grammer police have decided that it is not even necessary to go all the way to an ad hominem.

Shame on the nukists

▲ | ▼ • Reply • Share ›

X-45 • 3 years ago

As far as chicken little is concerned, you people appear to have completely lost touch with reality.

2 ▲ | ▼ • Reply • Share ›

debj181 • 3 years ago

the reactors are leaking. kill the Krill and you Kill life. Krill are all thru out the ocean... all they have to do is swim thru radiation...what eats them dies, etc. and so on. stupid, stupid to say this will all be OK. these levels. not only are you helping to melt the polar ice caps by heating up the ocean but you are irradiating all the fish and plant life in the ocean - getting in the air is whatever moisture evaporates from the ocean... drops radiation back onto the ground. IT IS A NEVER ENDING CYCLE UNLESS U CONTAIN IT> contain it with cement casing lined with lead all around and under - like a dome!!! do it now!!! expensive. lol... yes, its cheaper to just let the

Earth die. Get people to DO IT 'IF' they want to Live! once u kill the world, you cant buy it back.

4 ^ | v • Reply • Share ›

Michael Mann ➚ debj181 • 2 years ago

Since the radiation from Fukushima is such a tiny amount compared to the radiation already in the Pacific how on Earth can you justify such hyperbolic fear mongering?
http://www.whoi.edu/page.do...

7 ^ | v • Reply • Share ›

Frank Energy ➚ Michael Mann
• 7 months ago

LOL I saw such as outrageous comment, and then, yes, it was from the troll of trolls. A true believer, a pusher of lies to cover his false career.

LOL Because Chitin does not bio-magnify K40 Potassium. But it does biomagnify manmade radiation, and radiation once biomagnified is one of the few things that can damage Chitin (an important biological structure). chitin, BTW is used by ALL of the hardest hit species in the recent mass die offs, OR critter that consume critters that use Chitin are also on the death list.

Evidence is here:

http://nukeprofessional.blo...

^ | v • Reply • Share ›

Michael Mann ➚ Frank Energy
• 7 months ago

NukePro alias "Frank Energy" is one of many fake names this person uses to try and lure people

person uses to try and lure people to his personal website for his own benefit. Compare that to a real person working as a technician, who posts his opinions under his real name and is not told nor paid to post check out the comment history and decide who is a "troll" Don't fall for his anti-science Fear, Uncertainty and Doubt (FUD) campaign.

7 ▲ | ▼ • Reply • Share ›

X-45 • 3 years ago

"Even within 300 km of Fukushima, the additional radiation that was introduced by the Cesium-137 fallout is still well below the background radiation levels from naturally occurring radioisotopes." <<<<<<<<<< This is completely insane. Kim Martini, Ph.D you are seriously endangering lives.

2 ▲ | ▼ • Reply • Share ›

liltimmy ↗ X-45 • 3 years ago

you would think that someone with a Ph.D would not be saying stuff like radiation levels are harmless ,anyone with a Ph.D should be telling you there is NO SAFE level of radiation

2 ▲ | ▼ • Reply • Share ›

Aaron Oakley ↗ liltimmy • 5 months ago

Radiation is everywhere all the time. All living things naturally contain Carbon-14 (half life 5730 years) and Posassium-40 (half life 1.25 billion years), among others.

The "No safe level" thing is a regulatory assumption, not science.

7 ▲ | ▼ • Reply • Share ›

Mike O'Brien ↗ liltimmy • 2 years ago

So then no place on Earth is safe, we are all DOOMED. DOOMED I TELL YOU!!!!

2 ▲ | ▼ • Reply • Share ›

Michael ↗ liltimmy • 3 years ago

so you don't use a cell phone then?

2 ^ | v • Reply • Share ›

SimbaLover • 3 years ago

If the radiation is harmless then why are so many US Navy personnel sick from their rescue efforts?

1 ^ | v • Reply • Share ›

Michael Mann ↗ SimbaLover • 2 years ago

Actually the only ones who seem to be sick are those frightened and stressed out by radiophobia and lack of knowledge, exacerbated by unscrupulous lawyers looking for a big payday.

9 ^ | v • Reply • Share ›

Mike O'Brien ↗ SimbaLover • 2 years ago

Because most of them aren't sick from the rescue efforts.

8 ^ | v • Reply • Share ›

Mark Duffett ↗ SimbaLover • 5 months ago

It's more likely their illnesses are due to toxic emissions from the simultaneous, far more damaging yet far less well known Chiba refinery fire: http://www.alamy.com/stock-... (note thick black smoke plume)

http://www.timothymaloney.n...

though Michael Mann probably has the right of it.

2 ^ | v • Reply • Share ›

tedskam55 • 9 days ago

"a sprinkling"? Tepco isn't very forthcoming"!?!?!?!?
Nice try, professor.
Just the collection of propaganda bullshit "news" stories scattered on this page tells everyone all they need to know.
EVERYTHING written in this "article" is misleading, at best.
3 reactors in 100% meltdown for 6 years. One reactor

3 reactors in 100% meltdown for 6 years.....One reactor (#2) which blew sky high, released 4 million pounds of Spent MOX fuel rods, into the atmosphere and water around Fukushima. Tepco finally, 6 years later, admits that 2 other reactors have completely melted down and THROUGH the containment vessels (WHICH, automatically makes it exponentially WORSE than Chernobyl)...and oh yeah, Tepco has "no idea where the spent fuel is, from 2 reactors.
Tepco also admits to "300 tonnes a day of highly radioactive water running into (you know, "leaking" like said in this article) the Pacific, every day for the past 6 years. Problem with that number is, it takes 40,000 tons a day, for EACH reactor to keep the fuel cool. 300 tons just doesn't add up, even using Tepco math.
This article is misleading, misguided, and most certainly industry sponsored.
"there is no measurable radiation reaching north America".
Then I suppose you believe the EPA shut down over 90% of its RADNET stations after Fukushima, because of "cell phone tower interference" like they stated, huh? Funny how the towers were running just fine prior to Fukushima, then after, why all those pesky cell towers just gummed up the whole process so we just shut em down.
When Leukemia rates or thyroid cancer rates increase in the next few decades, I'm sure articles like this will say its because of .....well...use your imagination. Maybe cell phone towers will be the reason given.
It worked one other time.

Michael Mann ↗ tedskam55 • 9 days ago

You are funny! It really punctuates how ridiculous these fear mongering memes are! No one could seriously believe this stuff

Arrow Durfee • a month ago

Below is a map of the radiation flow out of Fukushima. Find the video at the top of the article. This is why I will not longer eat seafood from the Pacific Ocean. This is a map at 2.5 years after Fukushima. We are now in year 5

map at 2.5 years after Fukushima. We are now in year 5. Wonder how it will look 2.5 years from now. I offer the video in this link as evidence. Instead of their rhetoric consider this as you watch the film. The reactors have been leaking now for 5 years, the core is now submerged in the ocean. The core is hotter than its ever been. This is a surface water analysis..What about the deep sea? What about the oceanic plant life? What the film in this article shows us it that things are definitely dispersing and spreading through the ocean. This is scheduled to continue for the next 20,000 years if they can't find a way to remove these cores from the ocean. So far, 5 years an no luck with that.
http://iopscience.iop.org/a...

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Michael Mann ➚ Arrow Durfee • a month ago

Where do you get this BS? None of the cores are "hotter than they've ever been" There are no "cores in the ocean" you have so many misconceptions it's hard to know where to start. The tiny amount of contamination in the ocean is not going to have any effect on people, plants, or fish. Do you know any math? What is .000000000000000000000001 times 2.5 ? Try not to be so frightened.

5 Reply • Share ›

Arrow Durfee • a month ago

so now we have a bunch of rods sitting in the ocean. Nuclear physicists have said its so hot it will start turning into plutonium.. I think your site is pure BS. Are you Mr. Smith? think Matrix

Reply • Share ›

Michael Mann ➚ Arrow Durfee • a month ago

Funny, there are no rods sitting in the ocean, and no nuclear physicist has said anything about "it's so hot it will turn into plutonium" because heat doesn't do that in this dimension, the laws of physics do not change because you have a misconception. I think your post is pure BS... think dishonest and fear mongering propaganda.

5 Reply • Share ›

lyradd • 3 years ago

Can you comment on this:
David Suzuki has issued a scary warning about Japan's Fukushima nuclear plant,
saying that if it falls in a future earthquake, it's "bye bye Japan"
and the entire west coast of North America should be evacuated.

Reply • Share ›

KumachanTokyo ↗ lyradd • 3 years ago

Just ask yourself: if with the meltdown of 3 reactors we had ZERO deaths by radiation and 20 thousand by tsunami and the release of most of the inventory of the 3 reactors, what could happen that would make an even much much much much much much greater release of radiation?
Besides, I`m curious, did this "person" give the numbers of how much Bq/m3 would arrive in the USA to require an evacuation? And then, did IT went backward to give the numbers of how much needs to be released from Fukushima1 to reach that level in the USA?

Not to mention that the only building that would have been slightly at risk [reactor 4] saw a huge increase of steel pillars and concrete since april 2011 and it`s now being emptied.

see more

6 • Reply • Share ›

Chew ↗ KumachanTokyo • 3 years ago

"and the release of most of the inventory of the 3 reactors,"

Only about 4% of the Cs-137 inventory and less than 0.2% of the Sr-90 inventory of the cores has escaped. But your premise is correct. Just because another earthquake and/or tsunami were to hit

Fukushima it doesn't mean the cores will somehow magically release the remainder of their contents and propel it directly at north America.

Search for "276 PBq" here:
http://www.worldnuclearrepo...

1 ▲ | ▼ • Reply • Share ›

KumachanTokyo ➚ Chew
• 3 years ago

I knew the NISA numbers of 770PBq [but I didn`t look for the separated components] so I thought it was higher, also because what was releaseable released itself. The rest was mixed in the coria with steel, zircalloy and concrete or attached to any available surface.

But if by your document I see that [276PBq] 40% is in the water filtered by SARRY and KURION, I can only be happy.

But again, how could we reproduce even the previous leves of release with a super earthquake after 3 years of exponential decreasing of thermal power with the reactors at 18C, 28C and 25C?

▲ | ▼ • Reply • Share ›

Chew ➚ KumachanTokyo
• 3 years ago

The majority of the NISA estimation was mostly iodine-131.

The cesium and strontium in the basements isn't dissolved in the water. It is sitting in the basements as lumps and streamers of corium. The secondary containments were cracked by the earthquake and

explosions. Groundwater is leaking into the basements, picking up the cesium that is leeching out of the corium (cesium has a melting point of 28 C), and then making its way to the Pacific. When all the corium cools below 28 C most, if not all, of the radiation will stop escaping.

There is no way to reproduce the previous levels of release. Corium is a melted mixture of fuel, fuel assembly cladding, and control rods. It can't go critical.

Lisa Greene ➚ KumachanTokyo
• 3 years ago

http://en.wikipedia.org/wik...
(What I pasted previously didn't post...)

'did IT went backward'????

Guest ➚ KumachanTokyo • 3 years ago
This is "this person", as you called them:

KumachanTokyo ➚ Guest
• 3 years ago

Exactly, you wrote nothing after ":" because you think It is nothing, but IT is worse than nothing, the "IT" is a special category of Kaiju!! I also called "this person" IT as you might have noticed.
And I call IT all the "persons" like Busby that came to Japan to tell us that we were going to die of radiation but if we bought ITs magic pectine pills we would have had no cancer at all.
Then there are the Gundersen and the Caldicott kaiju, the former IT

the Caldicott kaiju: the former !! that said [check ITs own videos please] that reactor 3 had a nuclear explosion that vaporized pool3 [note: the pool 3 is OF

see more

4 • Reply • Share ›

Frank Energy
KumachanTokyo • 5 months ago

LIttle Bear, you have refutations and accusations, but no facts. Indeed a nuclear reactor can blow up in a TYPE of nuclear explosion, a runaway fission event. Study it here:

http://nukeprofessional.blo...

• Reply • Share ›

Michael Mann Frank Energy
• 5 months ago

Your comment is to a post over 3 years old, you are hoping no-one will notice, so ou can post your propaganda without being challenged, I believe the term is "capping" so that people who stumble across this article will see your comment first and not take the time to read further...

7 • Reply • Share ›

KumachanTokyo Michael Mann • 5 months ago

I guess this time it didn`t go well :)

I didn`t know "capping".

• Reply • Share ›

Michael Mann
KumachanTokyo • 5 months ago

I learned about "capping" from an anti-nuclear person who accused me of doing it when I responded

me of doing it when I responded to one of their posts, it makes sense, many people who look at the comments on the "newest" setting and do not scroll to see more comments, if the first page is all anti-nuclear, the casual reader will have the impression that all the comments are anti-nuclear.

6 ▲ | ▼ • Reply • Share ›

Michael Mann ➚ Frank Energy
• 5 months ago

Frank Energy is an alias of Nukpro he is just trying to generate traffic on his own webpage...There ia no possible way for a commercial nuclear reactor to have a nuclear explosion, the concentration of fissionable material isn't high enough period. To state it is possible is to deny physics, please talk to a nuclear engineer, knowledge is better than irrational fear!

7 ▲ | ▼ • Reply • Share ›

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