

### Pollution after Japan's Tsunami

The aftermath of pollution due to the tsunami would mostly affect the coastal water, where everything has been washed out from the land. Unfortunately, in this case, a nuclear contamination would also another source of pollution.

#### 1) Water pollution:

##### a) Soil contaminants and physical contaminants in ocean water:

The Tsunami has washed over farm land and many living area. In our everyday lives, we use contaminants such as pesticides, detergents, and herbicides. Sewage, if not treated and flood out can also act as water contaminants. Those pollutants reaches the sediment, then absorbed by the organisms which then proceed up the food chain, and finally ending in our stomach.

A little upside from this wash out of the land is the nitrogen-rich fertilizers in the oceans would increase the growth of phytoplankton, commonly known as algae. In addition, some fertilizers may even increase dramatically the growth of the algae, which will in turn affect the aquatic life beneath its covered area. Note that the algae feed on oxygen of the water. Due to this, aquatic life would have a very hard time to survive in those zones (oxygen cycle of marine ecosystem is broken, leading to a dissipation of the fishes. However, some of these algae can be consumed and they are high in minerals. We all know that Japanese have a high diet for seaweed, and there's also a good market for it too. Although the increase of algae wouldn't be much significant, but it would be an observable fact. But all this would depend on the after measurement of the pollution of Japan's coastal water, as it may create toxic algae as well.

As for the physical contaminants, such as plastic bags and other items, when thrown into water would mostly be mistaken by the animals as food (either fishes or birds). Accumulations of those items have been located in high concentrations in the northern pacific and recently in the Atlantic as well.

##### b) Oil spills:

The only contradiction to the consumption of the over bloomed algae would be the oil spills happening near the coasts. Although, the algae don't necessarily absorb the oil, it would be hard to remove the oil from its surface.

Oils are classified as light oil and heavy oil. The light oil is highly flammable and highly toxic, but it evaporates quite quickly. It can cause explosion if ignited and its fume is highly toxic for living creatures. As for heavy oil, it is much less toxic than the light oil but it has a longer life span. It can suffocate not only the aquatic animals when they come in contact but also the birds that feed on fishes. Oil is not perceived by the animals, in the case of the bird, it can die of hypothermia as the oil prevents the mats down the feathers. Note that when the heavy oil is washed ashore, it hardens on the rocks and the plants.

## 2) Nuclear pollution:

### a) Explanation of nuclear by products:

#### i) Iodine 129 and iodine 131

As some of you may know, thyroid constantly absorbs iodine. However, it cannot distinguish between radioactive and non-radioactive iodine. A suggestion of prevention would be saturating the level of iodine of our body by consuming stable iodine such as iodide salt (it is not iodized salt) and potassium iodide. Because the Japanese government considers that the level of radioactive iodine is still acceptable for the population, no tablets have been given out yet.

Notice that iodized table salt is not an alternative of the stable iodine. Iodized salt is suggested that is good to maintain health when consumed in a decent amount whereas excess or deficiency would lead to thyroid diseases.

#### ii) Cesium 137

In opposite of the radioactive iodine, we are constantly exposed to a small amount of cesium (either in contact with soil, water or air). It cannot be avoided! Atmosphere wise we surely cannot avoid it as breathing is part of our living, however consumption of highly Cesium-137 charged water (and milk) could be avoided. Note that if highly exposed to Cesium 137, cells will die and the risk of cancer would then increase. When cesium is consumed, it spreads uniformly in the human body. But it is found that

there's a higher concentration in the muscles than in the bones and fat. Since cesium has a short decay time (30.17 years), it has not been a big matter of attention.

b) Nuclear pollution:

i) Contamination through air transportation:

If the radioactive particles are pushed strong enough to reach the jet stream, then it could be widely spread over the globe. However, it is not the case for this event.

As explained above, iodine 131 and cesium 137 is dangerous for the human body in excess. As of now, the Japanese government has reported that there's a higher concentrations of those byproducts than acceptable level in some of the aliments in the nearby area of Fukushima.

When humans are highly exposed to those byproducts, their health is without doubt in danger, but also whom ever that has a close contact with them will also be affected.