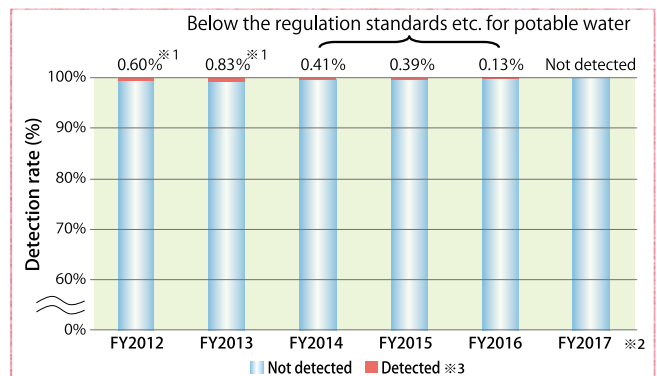


Impact of Radioactive Substances on Mountain Stream Water and Potable Stream Water

In 2012, during the thawing season, the Forestry and Forest Products Research Institute conducted a monitoring survey by measuring the radioactive cesium concentrations at the daily fixed time, at six locations in Fukushima Prefecture, in mountain streams originating in forests. Results indicated that almost no radioactive cesium was detected in mountain stream water flowing out of forests (the lower limit of detection was 1 Bq/L), but it was detected in some samples on days with rainfall. At the times of detection, the water was muddied with particles of fine soil. After filtration, no cesium was detected in the filtered water. From that, it can be inferred that the main source of radioactive cesium in mountain stream water is particles of fine soil etc.

Since December 2012, the Ministry of the Environment has monitored portable stream water etc., in municipalities which have requests in Fukushima Prefecture. According to survey data gathered over five years to date, no cesium was detected in 8,963 of all 9,020 samples (99.4%) in nine municipalities (Iitate Village, Okuma Town, Katsurao Village, Kawauchi Village, Kawamata Town, Tamura City, Namie Town, Naraha Town, and Hirono Town). After filtration, no cesium was detected in the filtered water from any location.

In FY2017, when stream water etc. was sampled at 142 locations and measured for radioactive cesium concentration, no cesium was detected in any sample (detection limit: 1 Bq/L) (Figure).



[Figure] Trend of Detection Rates of Radioactive Cesium in Monitoring of Potable Stream Water

※1 In FY2012 and FY2013, only three samples surpassed the regulatory standard for potable water.

※2 Measurement period: December 2012 - February 2018

※3 Lower limit of detection: 1 Bq/L



[Photo] Example of a Sampling Location (Iitate Village)

[Reference]

- Standards for Foods and Additives, Based on the Food Sanitation Law (potable water) (Ministry of Health, Labour and Welfare Recommendation No.130, March 15, 2012) Radioactive cesium (total of Cs-134 and Cs-137): 10 Bq/L
- Target value for radioactive substances in mains water (Management target value for mains water facilities) (Ministry of Health, Labour and Welfare, Pharmaceutical Safety and Environmental Health Bureau, Water Supply Division manager's notification 0305-1, dated March 5, 2012) Radioactive cesium (total of Cs-134 and Cs-137): 10 Bq/L

Reference : Ministry of the Environment "Measurement Results of Monitoring of Stream Water etc. in Decontamination Special Areas" (Summary of results for the past five years and of samples collected in February 2018)"

Column Main Findings Obtained from the Chernobyl Nuclear Power Plant Accident

How have forests, forestry, and timber-related industries been impacted since the Chernobyl nuclear power plant accident, which happened in 1986 in what was then the Soviet Union? This column examines the main points, with reference to recent bibliography, such as published documents from the Science Council of Japan and the International Atomic Energy Authority.

(Movement of Radioactive Cesium in Forests)

Radioactive cesium which fell on forests after the reactor accident first adhered to the forest canopy and to bark. After that, part of it was absorbed through plant surfaces, and the other part of it settled into bark for the long term, but within a few years, most of the cesium had moved to the forest floor. With the decomposition of organic matter on the forest floor, cesium moved to the soil surface layer, and adsorbed strongly to clay minerals, tending to stay in that surface layer for the long term. Even 10 years and more after the Chernobyl accident, there has been almost no movement of the peak radioactive cesium concentration in soil to lower layers, and movement to deep layers appears to be progressing slowly.

On the other hand, part of fallout radioactive cesium into forests has been moving dynamically, together with the circulation of substances in the forest ecosystem. That is attributed to the fact that radioactive cesium is an alkaline

element, like potassium, a major nutrient salt, and has similar properties. Also, within the circulation that makes efficient use of nutrient salts, radioactive cesium stays in a form that is relatively easy for organisms to incorporate. As a result, radioactive cesium remains in relatively high concentrations in living organisms in forest.

(Impact on Mushrooms etc.)

In Belarus, in Easterns Europe, there is long-standing contamination of mushrooms, raspberries, and wild animal meat. Average radioactivity levels in wild animal meat depend on the species, but are high in boar and deer.

(Radioactive Cesium in Timber)

In Belarus, there is said to be a correlation between radioactive cesium concentration in timber and the amount of cesium deposition in soil.

These findings obtained from the Chernobyl nuclear power plant accident is valuable for predicting the future for forests etc. impacted by the Fukushima accident in 2011. However, Japan and Chernobyl differ in climate, topography, geology, flora, and other aspects, and the utilizing manners of forest products are also different. Therefore, it is important to verify the differences based on resources such as results obtained.

Reference: Science Council of Japan "Radioactive Contamination from the Fukushima Reactor Accident and the Impacts on Forests, Forestry, and Timber-related Industries - Current Status and Problems", September 1, 2014;
IAEA (2006) "Report of the International Atomic Energy Authority Chernobyl Forum Expert Group "Environment", Environmental Consequences of the Chernobyl Accident and their Remediation: Twenty Years of Experience", (translated by the Science Council of Japan)