

Ongoing investigation at sub-zero temperatures

Research on environmental dynamics at Ogi Dam (Kawauchi Village, Fukushima Prefecture)

■ Study of lake bed

Ogi Dam is positioned among quiet mountains upstream of the Tomioka River, which is located in Kawauchi Village in the eastern part of Fukushima Prefecture. It also lies about 14 kilometers southeastward of Tokyo Electric Power Company (TEPCO)'s Fukushima Daiichi Nuclear Power Station. Various investigations have been conducted here since the end of 2012 to determine the behavior of radioactive materials, as the forests upstream of the dam were contaminated by the radioactive materials due to the accident at the nuclear power station.

On January 17, 2013, even though the site had been deeply covered with snow from the cold snap that hit the area several days earlier and delay in the schedule had been anticipated, the place was cleared enough for vehicles to pass through thanks to the effort of the staff who shoveled snow day after day.

A raft was being assembled to take sediment samples from the bed of the dam lake (**Photo 1**). The plan was to construct a tower on the raft and lower a cylindrical sampler vertically to take samples of the lake bed. The hands of the staff became numb in the cold with snow falling, and therefore the work did not proceed as had

been anticipated. That day all they could do was to assemble the tower. Collection of the samples of the soil of the lake bed had to be postponed and was conducted on March 19 and 20.

Another thing that had to be done before taking the samples was to remove the thick ice covering the lake. Staff on another boat were cracking the ice with hammers so they could move the raft to the sampling point (**Photo 2**).

■ Study of forest floor soil

When I looked toward the forest, I saw staff on the slope. After walking uphill slowly on the snow, I got to the place where the staff took soil samples using scraper plates, the devices to investigate the types and distribution of the soil (**Photo 3**). They made utmost attempt to protect themselves from the cold by holding several pocket body warmers and lining the bottom of their boots with warm sheets.





■ Study by scraping lichens

Lichens on the forest paths along the lake were also investigated. Cesium accumulates in lichens, which grow on tree bark and rocks, and therefore it is expected that new information about the amount of radiocesium and its migration will be obtained by continuous comparison of the samples taken from different places and at different times. On this day, certain lichens were carefully scraped off tree bark a little at a time at several places, and recorded along with the radiation dose rates (**Photo 4**).

The Fukushima-TRACE Project (long-term assessment of Transport of Radioactive Contaminant in the Environment of Fukushima) being conducted in these freezing temperatures has just begun. I am looking forward to the day when these persistent efforts will bear fruit.

Ogi Dam study items

(1) Study of the amount of the sediment

Study of the 3-dimensional shape of the lake bed and the sedimentary facies of the underground of the lake bed in order to get a good understanding of the amount of the sediment accumulating on the bottom of the lake and the speed it accumulates.

(2) Study of the dose rate

Periodic measurement of the plane expanse of dose rate distribution over the shore and on the bottom of the lake to find out how it changes.

(3) Study of the dam lake water and the sediment

Periodic measurement of the dam lake water, sediment and river water flowing in/out of the dam to study water flow, the migration and deposition of soil, and the state of contamination.

- Periodic measurement of flow rates, turbidity, etc. by water-level gauges, turbidity meters, etc. (near places where water flows in/out).
- Sampling of the water/sediment in the depth direction
- Measurement of the radioactive material concentration, mineral composition, particle size distribution, etc. of the samples.

Study of the forests near Ogi Dam

For the research of migration behavior of the radioactive materials in the forests surrounding Ogi Dam, vegetation, terrain and the distribution of soil are investigated, precipitation and volume of the water flowing over the ground surface (surface flow volume) and the degree of turbidity of water (turbidity) of the observation zone are steadily monitored, and the soil and water samples are analyzed.

(1) Study of the stumpage and forest floor

(2) Measurement of the terrain by GPS survey, minor leveling and 3-dimensional laser scanner

(3) Soil sampling by soil samplers and scraper plates

(4) Study of lichens

(5) Periodic measurement of air dose rates

(6) Periodic monitoring of surface flow in the forests of the observation zone (observation plot) and weather