FY2016 Results of the Radioactive Material Monitoring in the Water Environment

> March 2018 Ministry of the Environment

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Note: ND stands for "Not detectable" in this report.

Outline

Following is an outline of the results of monitoring for radioactive material carried out in FY2016 based on the Water Pollution Control Act. Monitoring locations are as shown in Figure 1 and Figure 2.

1. National Radioactive Material Monitoring in the Water Environment in the Whole of Japan (FY2016)

- Monitoring commenced in FY2014 at 110 public water areas and groundwater locations in 47 prefectures in Japan for the purpose of clarifying the distribution of radioactive materials in those areas nationwide (hereinafter referred to as "Nationwide Monitoring").
- The total β radioactivity and the detected γ-ray emitting nuclides were within past measurement trends¹. Detection limits differ by nuclide and sampling location, but overall were around 0.001 to 0.1 Bq/L in water and around 1 to 100 Bq/kg in sediments². ("Bq/kg" of sediment indicates "dried sediment" in this report, and the same shall apply to Radioactive Material Monitoring performed in Fukushima prefecture and the surrounding areas, and other national radioactive material monitorings performed.).
- \circ There were locations where the value of K-40 and total β radioactivity were elevated in both public water areas and groundwater, but these levels were thought to have been influenced by seawater or soil / rocks.
- As for other naturally occurring radionuclides, Pb-212 was detected in higher concentrations at some locations for groundwater than in past results. Pb-212 is in the thorium series, and generally occurs naturally in soil / rocks.
- At some public water area monitoring locations, the artificial radionuclides Cs-134 and Cs-137 were detected exceeding their detection limits, but their values were within the past measurement trends.
- It is appropriate to continue this monitoring the following fiscal year onward in order to clarify the distribution of radioactive materials in the water environment.

2. Radioactive Material Monitoring in the Water Environment in and around Fukushima Prefecture (FY2016)

- In response to the accident at the Tokyo Electric Power Company's Fukushima Daiichi NPS (hereinafter referred to as the "Fukushima NPS Accident"), monitoring has been conducted continuously since August 2011 at around 600 locations for public water areas and around 400 locations for groundwater in and around Fukushima prefecture for the purpose of clarifying the distribution of the accident-derived radioactive materials in the water environment (hereinafter referred to as "Post-Earthquake Monitoring").
- A summary of the radioactive cesium measurement results after the commencement of the FY2016 monitoring is as follows.

¹ "Within the past measurement trends" means that the results of the latest monitoring survey are evaluated from a technical perspective as not displaying extreme deviation from the results of past similar monitoring surveys.

² See Table 3.1-1, Table 3.1-2, and Table 3.1-3 in Part 1 of this report for the details of the detection limits.

<Public water areas>

- 1) Water (detection limit: 1 Bq/L for both Cs-134 and Cs-137)
 - At most locations, radioactive cesium was not detectable, although several locations showed a positive result for these radionuclide.
- 2) Sediments (detection limit: 10 Bq/kg for both Cs-134 and Cs-137)

[Rivers]

Overall, the levels of both Cs-134 and Cs-137 were 200 Bq/kg or less at most locations, though they
were detected in relatively higher levels at some limited locations, such as those within 20 km of Tokyo
Electric Power's Fukushima Daiichi Nuclear Power Plant. Changes in activity concentrations were
observed as a decreasing trend at most locations.

[Lakes]

Overall, the levels of both Cs-134 and Cs-137 were 3,000 Bq/kg or less at most locations, though they
were detected in relatively high levels at some limited locations, such as those within 20 km of the power
plant. Activity concentrations were observed to be decreasing or unchanged, except for some locations
which showed fluctuations.

[Coastal areas]

- Overall, the levels of both Cs-134 and Cs-137 were 200 Bq/kg or less at most locations. Changes in activity concentrations were observed generally as decreasing or unchanged at most locations except for several locations that showed fluctuations.
- < Groundwater >
 - Radioactive cesium was not detected in groundwater at any surveyed locations in FY2016 (detection limit: 1 Bq/L for both Cs-134 and Cs-137).
- The results concerning radionuclides other than radioactive cesium were as follows.

•Sr-89: Was not detected at any surveyed groundwater locations.

- •Sr-90: Was detected in collected sediments at several public water area locations, but basically remained at relatively low levels; was not detectable at any surveyed groundwater locations.
- Measured activity concentrations have fluctuated at some locations. There is a possibility that this is due to the effects of the Fukushima nuclear accident, but the fluctuations could also be due slight differences in sampling locations and the properties of individual samples. Therefore, it is appropriate to continue this monitoring on an ongoing basis over the following fiscal years.

3. Other Radioactive Material Monitoring Conducted Nationwide (FY2016)

 The results of the Monitoring of Environmental Radioactivity Levels (hereinafter referred to as "Monitoring of Levels"), which has been conducted by the Nuclear Regulation Authority for the purpose of clarifying the existence or nonexistence of the influence of nuclear facilities, etc. nationwide, were almost all within the past measurement trends.



Figure 1 Locations for monitoring radioactive materials (public water areas)



Figure 2 Locations for monitoring radioactive materials (groundwater)

Part 1: National Radioactive Material Monitoring in the Water Environment in the Whole of Japan (FY2016)

1 Objective and Details

1.1 Objective

In response to the Fukushima NPS Accident, during which radioactive materials were discharged causing environmental pollution, the Water Pollution Control Act was amended. It was decided that the Minister of the Environment should monitor pollution caused by radioactive materials in public water areas and groundwater and release the results from the perspective of preserving the health and living environment of the people.

Based on the above, this monitoring aims to clarify the distribution of radioactive materials in public water areas and groundwater nationwide.

1.2 Details

(1) Monitoring locations

- Public water areas: 110 locations (rivers: 107 locations; lakes: 3 locations)
- Groundwater: 110 locations

Monitoring locations were selected based on the following policy with a view to ensuring balanced nationwide monitoring (specific locations are as shown in Tables 1.2-2 and 1.2-3 and Figures 1.2-1 and 1.2-2).

(i) Public water areas

- At least one sampling location was selected in each prefecture, and additional locations were added according the area and population of each prefecture.
- · Locations within each prefecture were selected based on the following policy:
 - a) Select representative rivers (including lakes) within each prefecture in the same numbers listed above, taking into account the area and population in their basins.
 - b) Regarding rivers selected as explained in a), select locations from among those monitored for hazardous materials, etc. conducted under the Water Pollution Control Act, selected with consideration of water utilization points. Within a single river, give priority to a location in the lower reaches (including lakes located downstream).
 - c) As this monitoring does not aim to clarify the influence of specific sources, exclude locations close to those subject to Environmental Monitoring around Nuclear Facilities, etc. (Radiation Monitoring Grants) in principle.
- (ii) Groundwater
 - Two sampling locations were chosen in each prefecture, and one more location was added for each prefecture in which the amount of groundwater utilized had been large over the past several years.
 - Sampling locations for continuous monitoring of environmental standard items were selected based on the following policy:
 - a) Select regional representative wells (such as wells built for monitoring or major wells with an especially large amount of water yield) taking into consideration the amount of utilization of groundwater from

each groundwater basin and water vein (hereinafter referred to as "groundwater basins, etc.").

- b) Prioritize wells owned or managed by local governments, etc. in consideration of the convenience of coordination in case any additional survey is required.
- c) Select one location for continuous fixed point monitoring from among the locations selected in the manner above, taking into account that location's level of utilization and the representativeness of that groundwater basin in the wider area. Perform rolling monitoring at the remaining locations (for 5 years in principle).
- d) As this monitoring does not aim to clarify the influence of specific sources, exclude locations close to those subject to Environmental Monitoring around Nuclear Facilities, etc. (Radiation Monitoring Grants), in principle.

(2) Targets

- Public water areas: Water and sediments (for lakes, survey water both at the surface layer and bottom layers) (Additionally, as a reference, radioactive concentrations in soil and ambient dose rates in the environment (river beds, etc.) surrounding the sampling locations are to be measured.)
- · Groundwater: Water

(Additionally, as a reference, ambient dose rates near the sampling locations are to be measured.)

(3) Frequencies and periods

• Public water areas : Once a year

However, monitoring was conducted four times a year at two locations (one location in eastern and western Japan, respectively) in order to check any annual variation.

• Groundwater : Fixed point monitoring was conducted once a year, and rolling monitoring was conducted once every five years for each location in principle.

FY2016 monitoring periods are as shown in Table 1.2-4.

(4) Conducted analyses

The following analyses were conducted for collected samples:

- Measurement of total β radioactivity concentrations.
- γ-ray spectrometry measurement using a germanium semiconductor detector (In principal, all detectable radionuclides, including artificial radionuclides and major naturally occurring radionuclides, were analyzed).

(5) Comparison with the past measurement trends

Obtained values were compared with the past measurement trends, and if any deviation was suspected, the validity of the measured values was rechecked (potential number transcription errors, incorrect calibration of equipment, etc.).

Because this monitoring has just commenced, there are no accumulated data for some locations. Therefore,

results from similar environmental monitoring surveys conducted so far will be used for comparison for the time being. Specifically, results from the Monitoring of Environmental Radioactivity Levels and Monitoring of the Surrounding Environment conducted by the Nuclear Regulation Authority, as well as the results from the Radioactive Material Monitoring in the Water Environment in and around Fukushima Prefecture conducted by the Ministry of the Environment were utilized. When making comparisons, due consideration was given to the possibility that the values of Cs-137 and other accident-derived radionuclides would have increased after the Fukushima NPS Accident.

Essentially, nationwide data for the past two decades were used for comparison. Considering the influence of the Fukushima NPS Accident and informed by actual measurements, "two years after the accident" was assumed to be a steady state, and therefore, data from between March 11, 2011 to March 10, 2013 were excluded.

(6) Measures to be taken when a value deviating from the past measurement trends was detected

The following measures were taken when a value deviating from the past measurement trends was detected (see Figure 1.2-3).

(6)-1 Release of preliminary values

Any value that is suspected to deviate from the past measurement trends should be immediately evaluated professionally by the chair and the deputy chair, and if it is judged highly urgent (when it has been confirmed that the value is highly likely to deviate from the past measurement trends, and additional detailed analyses are considered to be necessary), a preliminary report should be released as promptly as possible.

In such a case, the following related data should be compiled as basic data for professional evaluation. Members of the Evaluation Committee other than the chair and the deputy chair should be informed of the relevant information together with the professional evaluation by the chair and the deputy chair (see Table 1.2-1 for the chair and other committee members).

- (i) Results of the measurement concerning water and sediments (γ -ray spectrometry and total β radioactivity concentrations), and ambient dose rates
- (ii) Sampling dates, sampling locations (maps, water depth, river width, etc.), sampling methods, and sampling circumstances (photos)
- (iii) Weather data for about one week close to the measurement date (the amount of precipitation, in particular)
- (iv) Ambient dose rates measured for the last month or so at neighboring points
- (v) Changes in detected values of a relevant radionuclide compared to the past

(6)-2 Detailed analyses and release of the results

For data for which the preliminary report was released as explained in (6)-1 above, the following detailed analyses are to be conducted and the results are to be released.

- Specific analyses to identify radionuclides (including measurement of individual radionuclides through radiochemical analyses)
- · Additional measurements in the surrounding areas of the relevant surveyed location

(7) Disclosure of measurement results

The measurement results data are made publicly available on the following Ministry of the Environment website:

http://www.env.go.jp/en/water/rmms/surveys.html

Table 1.2-1 List of members of the Evaluation Committee on Radioactive Material Monitoring in the Water Environment

IIMOTO Takeshi (Deputy chair)	Professor, Division for Environment, Health and Safety, the University of Tokyo
ISHII Nobuyoshi	Principal Researcher, Environmental Transfer Parameter Research Team, The Fukushima Project Headquarters, National Institute of Radiological Sciences, National Institutes for Quantum and Radiological Science and Technology
TOKUNAGA Tomochika	Professor, Department of Environment Systems, Graduate School of Frontier Sciences, the University of Tokyo
HAYASHI Seiji	Research Group Manager & Head of Environmental Assessment Section, Fukushima Branch, National Institute for Environmental Studies
FUKUSHIMA Takehiko (Chair)	Director of the Center, Ibaraki Kasumigaura Environmental Science Center

N	DC	D (Sampling location						
NO.	Prefecture	Property	Water area	Location	Municipality				
1		River	Ishikari River	Domestic water intake at Ishikari River in	Asahikawa City				
2		River	Ishikari River	Intake at the Shirakawa water purification plant	Sapporo City				
	-			in Sapporo City	T T T T T				
3		River	Teshio River	Nakashibetsu Bridge (Intake at the Higashiyama water purification plant in	Shibetsu City				
				Shibetsu City)	,				
4	Haldraida	River	Tokoro River	Tadashi Bridge	Kitami City				
5	Profecture	Divor	Kuchiro Divor	Intake at the Aikoku water purification plant in	Kushiro City				
5	Trefecture	Kivei	Rushilo River	Kushiro City	Kushilo City				
6	-	River	Tokachi River	Nantai Bridge	Obihiro City				
7	-	River	Sarugawa River	Sarugawa Bridge (Tomigawa)	Hidaka Town				
8		River	Matsukura River	Mitsumori Bridge (Before the confluence with Torasawa River)	Hakodate City				
			Shiribeshi-	Intake at the Kitahiyama simple water plant in					
9		River	toshibetsu	Kitahiyama Town	Setana Town				
10		D.	River	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	N. 1. 1				
10	Aomori	River	Iwaki River	Tsugaru-ohashi Bridge	Nakadomari Town				
11	Prefecture	River	Mabechi River	Shiriuchi Bridge	Hachinohe City				
12	Iwate	Biyor	Haigawa Biyar	Miyaka Bridge	Minoho City				
13	Prefecture	River	Kitakami River	Chitose Bridge	Ichinoseki City				
15	Miyagi	River	A bukuma River	Iwanuma (Abukuma Bridge)	Iwanuma City				
16	Prefecture	River	Natori River	Yuriage-ohashi Bridge	Natori City				
17	Akita	River	Yoneshiro River	Noshiro Bridge	Noshiro City				
18	Prefecture	River	Omono River	Kurose Bridge	Akita City				
19	Yamagata	River	Mogami River	Ryou Bridge	Sakata City				
20	Prefecture	River	Akagawa River	Shinkawa Bridge	Sakata City				
21	Ender al large	River	Agano River	Shingo Dam	Kitakata City				
22	Prefecture	River	Abukuma River	Taisho Bridge (Fushiguro)	Date City				
23	Trefecture	River	Kujigawa River	Takachihara Bridge	Yamatsuri Town				
24	Ibaraki	Lake	Lake Kasumigaura	Center of the lake	Miho Village				
25	Prefecture	River	Kokai River	Fumimaki Bridge	Toride City				
26	Tochigi	River	Nakagawa River	Shinnaka Bridge	Nakagawa Town				
27	Prefecture	River	Kinugawa River	Kinugawa Bridge (Hoshakuji Temple)	Utsunomiya City				
28	Gunma Prefecture	River	Tonegawa River	Toneozeki Weir	(Saitama Prefecture)				
29	Thereetare	River	Watarase River	Watarase-ohashi Bridge	Tatebayashi City				
30		River	Arakawa River	Kuge Bridge	Kumagaya City				
31	Saitama	River	Arakawa River	Akigase Intake Weir	Saitama City/ Shiki City				
32	Prefecture	River	Edogawa River	Nagareyama Bridge	Nagareyama City (Chiba Prefecture) / Misato City				
33	Chiba	River	Tonegawa River	Kakozeki Weir	Tonosho Town				
34	Prefecture	River	Ichinomiya River	Nakano Bridge	Ichinomiya Town				
35		Lake	Lake Inbanuma	Lower area of water supply intake	Sakura City				
27	Tobyo	River Divor	Tamagawa River	Hajiima raw water ayonky point	Akishima City				
38	Metoropolis	River	Sumida River	Ryogoku Bridge	Chuo City / Sumida City				
39		River	Arakawa River	Kasai Bridge	Koto City / Edogawa City				
40		River	Tsurumi River	Rinko Tsurumigawa Bridge	Yokohama City				
41	Kanagawa	River	Sagami River	Banyu Bridge	Hiratsuka City				
42	Prefecture	River	Sakawa River	Sakawa Bridge	Odawara City				
43	Niigata	River	Shinano River	Heisei-ohashi Bridge	Niigata City				
44	Prefecture	River	Agano River	Oun Bridge	Niigata City				
45	Toyama Prefecture	River	Jinzu River	Hagiura Bridge	Toyama City				
46	Ishikawa	River	Saigawa River	Okuwa Bridge	Kanazawa City				
47	Prefecture	River	Tedori River	Hakusangoguchi Dike	Hakusan City				
48	Fukui	River	Kuzuryu River	Fuseda Bridge	Fukui City				
49	Prefecture	River	Kitagawa River	Takatsuka Bridge	Obama City				
50	Yamanashi Drofe et	River	Sagami River	Katsuragawa Bridge	Uenohara City				
52	Prefecture	River	Fujikawa River	Nanbu Bridge	Ivanbu Town				
52	Nagano	River	Saigawa Piyor	Kojchi Bridge	Nagano City				
54	Prefecture	River	Tenrvu River	Tsutsuii Bridge	lida City				
				· · · · · · · · · · · · · · · · · · ·					

Table 1.2-2 List of locations for the FY2016 Nationwide Monitoring (public water areas) (No. 1)

N.	Desfeat	Durant	Sampling location						
No.	Prefecture	Property	Water area	Location	Municipality				
55	Gifu	River	Kisogawa River	Tokai-ohashi Bridge (Naruto)	Kaizu City				
56	Prefecture	River	Nagara River	Tokai-ohashi Bridge	Kaizu City				
57	Shimolro	River	Kanogawa River	Kurose Bridge	Numazu City				
58	Drafactura	River	Ooi River	Fujimi Bridge	Yaizu City / Yoshida Town				
59	Prelecture	River	Tenryu River	Kaketsuka Bridge	Iwata City / Hamamatsu City				
60	Aichi	River	Shonai River	Mizuwake Bridge	Nagoya City				
61	Drafactura	River	Yahagi River	Iwazutenjin Bridge	Okazaki City / Toyota City				
62	Trefecture	River	Toyogawa River	Eshima Bridge	Toyokawa City				
63	Mie	River	Suzuka River	Ogura Bridge	Yokkaichi City				
64	Prefecture	River	Miyakawa River	Watarai Bridge	Ise City				
65	Shiga	River	Adogawa River	Joan Bridge	Takashima City				
66	Prefecture	Lake	Lake Biwako	Karasakioki-Chuo					
67	Kvoto	River	Yuragawa River	Yuragawa Bridge	Maizuru City				
68	Prefecture	River	Katsura River	Before the confluence of three tributaries of Katsura River	Oyamazaki Town				
69	Osaka	River	Inagawa River	Gunko Bridge	Itami City (Hyogo prefecture)				
70	Drefecture	River	Yodogawa River	Sugaharashirokita-ohashi Bridge	Osaka City				
71	Trefecture	River	Ishikawa River	Takahashi	Tondabayashi City				
72	Hyogo	River	Kakogawa River	Kakogawa Bridge	Kakogawa City				
73	Prefecture	River	Mukogawa River	Hyakkenbi	Takarazuka City				
74	Trefecture	River	Maruyama River	Kaminogo Bridge	Toyooka City				
75	Nara	River	Yamato River	Fujii	Oji Town				
76	Prefecture	River	Kinokawa River	Okura Bridge	Gojo City				
77	Wakayama	River	Kinokawa River	Shinrokkaizeki Weir	Wakayama City				
78	Prefecture	River	Kumano River	Kumano-ohashi Bridge	Shingu City				
79	Tottori Prefecture	River	Sendai River	Gyotoku	Tottori City				
80	Shimane	River	Hiikawa River	Kandatsu Bridge	Izumo City				
81	Prefecture	River	Gonokawa River	Sakurae-ohashi Bridge	Gotsu City				
82	Okayama	River	Asahikawa River	Otoite Weir	Okayama City				
83	Prefecture	River	Takahashi River	Kasumi Bridg	Kurashiki City				
84	Hiroshima	River	Ota River	Water supply intake in Hesaka	Hiroshima City				
85	Prefecture	River	Ashida River	Kominomi Bridge	Fukuyama City				
86	Yamaguchi	River	Nishiki River	Domestic water intake for the city	Iwakuni City				
87	Prefecture	River	Koto River	Suenobu Bridge	Ube City				
88	Tokushima	River	Yoshino River	Takase Bridge	Ishu Town				
89	Prefecture	River	Nakagawa River	Nakagawa Bridge	Anan City				
90	Prefecture	River	Dokigawa River	Marugame Bridge	Marugame City				
91	Ehime	River	Shigenobu River	Deai Bridge	Matsuyama City				
92	Pretecture	River	Hijikawa River	Hıjıkawa Bridge	Ozu City				
93	Kochi	River	Kagami River	Kachuzeki Weir	Kochi City				
94	Prefecture	River	Niyodo River	Hatazeki Weir (1) Center of flow	lino fown				
95	Fukuoka	River	Nolva garra Direct	Hinode Bridge	INOGATA City				
90	Prefecture	Divor	Chilarge Diver	Sniodara Bridge					
97	Saga	River	Kasegawa River	Kase Bridge	Saga City				
00	Nagasaki	River	Honmyo River	In front of Tenma Park	Isahaya City				
100	Prefecture	River	Uragami River	Ohashizeki Weir	Nagasaki City				
101	Kumamoto	River	Kikuchi River	Shiroishi	Nagomi Town				
102	Prefecture	River	Midori River	Uesuoizeki Weir	Kumamoto City				
102	Oita	River	Oita River	Funaichi-ohashi Bridge	Oita City				
103	Prefecture	River	Oono River	Shirataki Bridge	Oita City				
105	Miyazaki	River	Gokase River	Miwa	Nobeoka City				
106	Prefecture	River	Ovodo River	Shinajoj Bridge	Miyazaki City				
107	Kagoshima	River	Kotsuki River	Iwasaki Bridge	Kagoshima City				
108	Prefecture	River	Kimotsuki River	Matase Bridge	Kanova City				
109	Okinawa	River	Genka River	Water intake	Nago City				
110	Prefecture	River	Miyara River	Omoto water intake	Ishigaki City				

Table 1.2-2 List of locations for the FY2016 Nationwide Monitoring (public water areas) (No. 2)

No.	o. Prefecture Property Municipality		Municipality	District	Monitoring method
1		Groundwater	Sapporo City	Kitasanjonishi, Chuo Ward	Fixed point monitoring
2	Hokkaido Prefecture	Groundwater	Asahikawa City	Nagayama	Rolling monitoring
3		Groundwater	Aomori City	Shinmachi	Fixed point monitoring
4	Aomori Prefecture	Groundwater	Hirosaki City	Kamisukimachi	Rolling monitoring
5		Groundwater	Morioka City	Motomiya	Fixed point monitoring
6	Iwate Prefecture	Groundwater	Kamaishi City	Shinmachi	Rolling monitoring
7		Groundwater	Sendai City	Honcho, Aoba Ward	Fixed point monitoring
8	Miyagi Prefecture	Groundwater	Shichikashuku Town	Seki	Rolling monitoring
9		Groundwater	Daisen City	Nijvaji	Fixed point monitoring
10	Akita Prefecture	Groundwater	Kitaakita City	Wakigami	Rolling monitoring
11		Groundwater	Yamagata City	Hatagomachi	Fixed point monitoring
12	Yamagata Prefecture	Groundwater	Shinio City	Torigoe	Rolling monitoring
13		Groundwater	Koriyama City	Asahi	Fixed point monitoring
14	Fukushima Prefecture	Groundwater	Aizuwakamatsu City	Kozashimachi	Rolling monitoring
15		Groundwater	Teukuba City	Kenkurgehien	Fixed point monitoring
16	Ibaraki Prefecture	Groundwater	Ishioka City	Higashiohashi	Rolling monitoring
10	Ibaraki i felectule	Groundwater	A mi Town	Hanawa	Rolling monitoring
17		Groundwater	Shimotsuke City	Machida	Fixed point monitoring
10	Tochigi Profecture	Groundwater	Obtawara City	Honobo	Polling monitoring
20	Toenigi Fielectule	Groundwater	Nagi Taum	Тоторите	Rolling monitoring
20		Groundwater	Maabaabi City	Shilrishimeaha	Fired noint monitoring
21	Cunmo Profestura	Groundwater	Ota City	Heseweeke	Pixed point monitoring
22	Gunna Prefecture	Groundwater	Nalionalia Taum	Hosoyacilo	Rolling monitoring
23		Groundwater	Nakanojo Town	Isemachi	Rolling monitoring
24		Groundwater	Talama City	Mikura, Minuma ward	Fixed point monitoring
25	Saitama Prefecture	Groundwater	Tokorozawa City	Miyamotocho	Rolling monitoring
26		Groundwater	Kazo City	Hanasakikita	Rolling monitoring
27		Groundwater	Kashiwa City	Funato	Fixed point monitoring
28	Chiba Prefecture	Groundwater	Chosel Village	Kaneda	Rolling monitoring
29		Groundwater	Ichihara City	Higashikuniyoshi	Rolling monitoring
30	Tokyo Metoropolis	Groundwater	Koganei City	Kajinocho	Fixed point monitoring
31		Groundwater	Higashiyamato City	Nakahara	Rolling monitoring
32	Kanagawa Prefecture	Groundwater	Hadano City	Imaizumi	Fixed point monitoring
33	-	Groundwater	Zama City	Sagamigaoka	Rolling monitoring
34		Groundwater	Niigata City	Nagata, Chuo Ward	Fixed point monitoring
35	Niigata Prefecture	Groundwater	Gosen City	Muramatsu Ko	Rolling monitoring
36		Groundwater	Tsubame City	Akibacho	Rolling monitoring
37	Toyama Prefecture	Groundwater	Toyama City	Funahashikitamachi	Fixed point monitoring
38		Groundwater	Tonami City	Saiwaicho	Rolling monitoring
39	Ishikawa Prefecture	Groundwater	Hakusan City	Kuramitsu	Fixed point monitoring
40		Groundwater	Hakui City	Asahimachi A	Rolling monitoring
41	Fukui Prefecture	Groundwater	Fukui City	Ote	Fixed point monitoring
42		Groundwater	Echizen City	Hachiman	Rolling monitoring
43	Yamanashi Prefecture	Groundwater	Showa Town	Saıjyoshinden	Fixed point monitoring
44		Groundwater	Yamanashi City	Ono	Rolling monitoring
45		Groundwater	Nagano City	Tsurugamidoricho	Fixed point monitoring
46	Nagano Prefecture	Groundwater	Omachi City	Omachi	Rolling monitoring
47		Groundwater	Ina City	Nishiharuchika	Rolling monitoring
48		Groundwater	Gifu City	Kanoshimizucho	Fixed point monitoring
49	Gifu Prefecture	Groundwater	Kagamihara City	Nakasakuramachi	Rolling monitoring
50		Groundwater	Hida City	Kawaicho	Rolling monitoring
51		Groundwater	Numazu City	Hara	Fixed point monitoring
52	Shizuoka Prefecture	Groundwater	Fuji City	Iwamoto	Rolling monitoring
53		Groundwater	Shizuoka City	Kurihara, Suruga Ward	Rolling monitoring
54		Groundwater	Nagoya City	Kawaharatori, Showa Ward	Fixed point monitoring
55	Aichi Prefectur	Groundwater	Ichinomiya City	Okucho	Rolling monitoring
56		Groundwater	Toyokawa City	Hiraocho	Rolling monitoring

Table 1.2-3 List of locations for the FY2016 Nationwide Monitoring (groundwater) (No. 1)

				tationing (ground	
No.	Prefecture	Property	Municipality	District	Monitoring method
57		Groundwater	Suzuka City	Inoucho	Fixed point monitoring
58	Mie Prefecture	Groundwater	Matsusaka City	Toyoharacho	Rolling monitoring
59		Groundwater	Ise City	Nakazucho	Rolling monitoring
60		Groundwater	Moriyama City	Miyakecho	Fixed point monitoring
61	Shiga Prefecture	Groundwater	Maibara City	Shiori	Rolling monitoring
62		Groundwater	Taga Town	Nakagawara	Rolling monitoring
63	Vyoto Profesture	Groundwater	Kyoto City	Kamihonnojimaecho, Nakagyo Ward	Fixed point monitoring
64	Kyoto Flelectule	Groundwater	Yawata City	Tozudoden	Rolling monitoring
65	Ocalca Profestura	Groundwater	Sakai City	Daisennakamachi, Sakai Ward	Fixed point monitoring
66	Osaka Prefecture	Groundwater	Neyagawa City	Koyamotomachi	Rolling monitoring
67		Groundwater	Itami City	Kuchisakai	Fixed point monitoring
68	Hyogo Prefecture	Groundwater	Toyooka City	Saiwaicho	Fixed point monitoring
69		Groundwater	Tatsuno City	Ibocho	Rolling monitoring
70	New Drofesture	Groundwater	Nara City	Sakyo	Fixed point monitoring
71	Nara Prefecture	Groundwater	Ikoma City	Arisatocho	Rolling monitoring
72	Walana Dafata	Groundwater	Kinokawa City	Takano	Fixed point monitoring
73	wakayama Prefecture	Groundwater	Nachikatsuura Town	Ichiya	Rolling monitoring
74	Tattari Drafaatura	Groundwater	Tottori City	Saiwaicho	Fixed point monitoring
75	Totton Prefecture	Groundwater	Hoki Town	Kobayashi	Rolling monitoring
76	Shimon a Drufe store	Groundwater	Matsue City	Nishikawatsucho	Fixed point monitoring
77	Snimane Prefecture	Groundwater	Izumo City	Himebara(2)	Rolling monitoring
78		Groundwater	Kurashiki City	Fukui	Fixed point monitoring
79	Okayama Prefecture	Groundwater	Ibara City	Sasakacho	Rolling monitoring
80	Illing him Durfordam	Groundwater	Hiroshima City	Kamisenocho, Aki Ward	Fixed point monitoring
81	Hirosnima Prefecture	Groundwater	Takehara City	Shimonocho	Rolling monitoring
82	V	Groundwater	Yamaguchi City	Ouchimihori	Fixed point monitoring
83	ramagueni Prefecture	Groundwater	Iwakuni City	Shutomachi Shimokubara	Rolling monitoring
84	Talmahima Drafa sturr	Groundwater	Tokushima City	Fudohoncho	Fixed point monitoring
85	Tokushina Flelectule	Groundwater	Yoshinogawa City	Kamojimacho Jogejima	Rolling monitoring
86	Vagarua Profactura	Groundwater	Takamatsu City	Bancho	Fixed point monitoring
87	Kagawa Flelectule	Groundwater	Marugame City	Kanakuracho	Rolling monitoring
88		Groundwater	Matsuyama City	Hiraimachi	Fixed point monitoring
89	Ehime Prefecture	Groundwater	Masaki Town	Nishikoizumi	Rolling monitoring
90		Groundwater	Niihama City	Kubotacho	Rolling monitoring
91	Kochi Profesture	Groundwater	Kochi City	Kerako	Fixed point monitoring
92	Koelli Flelectule	Groundwater	Ino Town	Hakawa	Rolling monitoring
93	Fukuoka Profestura	Groundwater	Kurume City	Tanushimarumachi Akinari	Fixed point monitoring
94	T ukuoka T lefeetule	Groundwater	Miyama City	Setakamachi Shimonosho	Rolling monitoring
95	Saga Profecture	Groundwater	Saga City	Yamatochoniiji	Fixed point monitoring
96	Saga Pielectule	Groundwater	Karatsu City	Kyuragimachi Amagawa	Rolling monitoring
97	Nagasaki Profecure	Groundwater	Isahaya City	Eidamachi	Fixed point monitoring
98	Nagasaki Flelecule	Groundwater	Tsushima City	Mitsushimamachi	Rolling monitoring
99		Groundwater	Kumamoto City	Suizenji, Chuo Ward	Fixed point monitoring
100	Kumamoto Prefecture	Groundwater	Tamana City	Hanegi	Rolling monitoring
101		Groundwater	Yamaga City	Koga	Rolling monitoring
102	Oita Professure	Groundwater	Saiki City	Kamioka	Fixed point monitoring
103		Groundwater	Taketa City	Tamarai	Rolling monitoring
104		Groundwater	Miyakonojo City	Minamiyokoichicho	Fixed point monitoring
105	Miyazaki Prefecture	Groundwater	Kobayashi City	Minaminishikata	Fixed point monitoring
106		Groundwater	Miyazaki City	Yamasakicho Hamayama	Rolling monitoring
107	Kagoshima Profesture	Groundwater	Kagoshima City	Tamazatocho	Fixed point monitoring
108	ragosnina rielectule	Groundwater	Kirishima City	Kokubukawahara	Rolling monitoring
109	Okinawa Profacture	Groundwater	Miyakojima City	Hirarahigashinakasonezoe	Fixed point monitoring
110	Okinawa Fielecture	Groundwater	Motobu Town	Namizato	Rolling monitoring

Table 1.2-3 List of locations for the FY2016 Nationwide Monitoring (groundwater) (No. 2)



Figure 1.2-1 Map showing locations for FY2016 Nationwide Monitoring (public water areas)



Figure 1.2-2 Map showing locations for FY2016 Nationwide Monitoring (groundwater)

		Public v	vater areas	Groundwater		
Blocks	Prefectures	Number of Locations (*1)	Period	Number of locations	Period	
Hokkaido block	Hokkaido	9	Aug. 23 to Nov. 7	2	Aug. 22	
Tohoku block	Aomori, Iwate, Miyagi, Akita, Yamagata and Fukushima	14	Sep. 2 to Oct. 4	12	Sep 2 to Sep.29	
Kanto block	Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Yamanashi and Shizuoka	26 (2)	Aug. 24 to Oct 21	27	Aug. 23 to Sep 16	
Chubu block	Toyama, Ishikawa, Fukui, Nagano, Gifu, Aichi and Mie	15	Aug 29 to Oct. 14	18	Aug. 29 to Sep. 16	
Kinki block	Shiga, Kyoto, Osaka, Hyogo, Nara and Wakayama	14 (1)	Aug. 31 to Oct. 4	14	Aug. 29 to Sep. 9	
Chugoku-Shikoku block	Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime and Kochi	16	Aug. 22 to Oct. 13	19	Aug. 22 to Oct. 13, Feb. 14 (*2)	
Kyushu and Okinawa block	Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima and Okinawa	16	Aug. 22 to Sep. 16	18	Aug. 23 to Sep. 16	
Survey to check annual variation	Gunma and Okayama	2	May 24 to Jan. 27	-	-	

Table 1.2-4 Monitoring points and period by block (FY2016)

(*1) Numbers in parentheses designate monitoring locations for lakes; plain numbers are for rivers.

(*2) The groundwater at No. 77 was collected on February 14, and collection from other locations finished by October 13.



Figure 1.2-3 Procedures for professional evaluation of the results of the Nationwide Monitoring

2 Survey Methods and Analysis Methods

2.1 Survey methods

Samples were collected based on the following guidelines in principle, as outlined below.

- Water Quality Survey Method (September 30, 1971; Notice Kansuikan No. 30 issued by the Director General of the Water Quality Preservation Bureau, Ministry of the Environment)
- Sediment Survey Method (August 8, 2012; Notice Kansuitaisuihatsu No. 120725002 issued by the Director General of the Environmental Management Bureau, Ministry of the Environment)
- Groundwater Quality Survey Method (September 14, 1989; Notice Kansuikan No. 189 issued by the Director General of the Water Quality Preservation Bureau, Ministry of the Environment)
- Environmental Sample Collection Method (1983, Ministry of Education, Culture, Sports Science and Technology (hereinafter referred to as "MEXT")'s Radioactivity Measurement Method Series)
- Sample Pretreatment for Instrumental Analysis Using Germanium Semiconductor Detectors (1982, MEXT's Radioactivity Measurement Method Series)

(1) Public water areas

• Water:

Water samples of around 160 L (hydrochloric acid added) and around 2 L (nitric acid added) were collected at the predetermined points. From the 160 L sample (hydrochloric acid added), 80 L was used for γ -ray spectrometry analyses and the remaining 80 L was preserved for possible detailed analyses. From the 2 L sample (nitric acid added), 1 L was used to measure total β radioactivity concentrations.

Additionally, the transparency (or Secchi disk depth) was measured when collecting water samples, and in the case that transparency was thought to have been affected by rainwater based on comparison to prior measurements, or if there was no past data to compare to, the measured transparency was 50 cm or less and it was suspected that rainwater may have influenced transparency, the water was not used as samples.

• Sediments:

Bottom sediment samples of around 6 L were collected at the predetermined points at a depth of around 10 cm from the surface layer by using an Ekman-Birge grab sampler etc., and 3 L out of the 6 L was used for γ -ray spectrometry analyses.

• Soil:

Soil samples (around 5 cm in diameter) were collected at a depth of around 5 cm at five points within a 3 to 5 meter square (four vertexes and the diagonal intersection point), or, when it was difficult to find an appropriate square to determine five such sampling locations, soil from five points in 3 to 5 meter intervals along a river were collected and were brought back separately. Samples thus collected at the five points were mixed in equal amounts respectively and were used for analyses.

• Ambient dose rates (soil sampling locations):

Ambient dose rates were measured by installing NaI (Tl) scintillation survey meters at a height of 1 m from the ground surface on both banks of a river (or in the case of a lake, installing a NaI (Tl) scintillation survey meter at one point on lake side) so that the meters would face the sampling location of river water (or lake

water).

(2) Groundwater

• Water:

Groundwater samples of around 160 L (hydrochloric acid added) and 2 L (nitric acid added) were collected at the predetermined wells, etc. 80 L of the 160 L sample (hydrochloric acid added) was used for γ -ray spectrometry analyses and the remaining 80 L was preserved for possible detailed analyses. 1 L of the 2 L sample (nitric acid added) was used for to measure total β radioactivity concentrations.

When collecting water samples, it was confirmed that water temperature, transparency, pH, and electrical conductivity remained constant by letting the water pass for several minutes, and changes in the transparency, etc. thereafter were recorded as notes.

• Ambient dose rates:

Ambient dose rates were measured by installing NaI (Tl) scintillation survey meters at a height of 1 m from the ground surface near the relevant wells, etc. so that they would face the sampling location of groundwater (or the groundwater layer).

2.2 Analysis methods

For public water areas (water, sediments and soil) and groundwater (water), total β radioactivity concentrations and γ -ray spectrometry with a germanium semiconductor detector were conducted using the methods below. As a general rule, the γ -ray spectrometry measurement covered all detectable radionuclides (including artificial radionuclides and naturally occurring radionuclides). Measurements were described to two significant digits, and the unit of measures were "Bq/L" for water samples from public water areas and groundwater samples, and "Bq/kg" in for sediment samples from public water areas, respectively.

The adopted analysis methods were essentially in line with the MEXT's Radioactivity Measurement Method Series, and detection limits were set around 0.001 to 0.01 Bq/L for water samples and around 1 to 30 Bq/kg for sediment samples. (However, these detection limits did not apply to radionuclides with short half-lives or those with extremely low γ -ray emission rates.)

- Measurement of total β radioactivity concentrations: The samples were concentrated and dried, and then measurements were taken using a low-background gas-flow proportional counter.
- γ -ray spectrometry measurement: After proper pretreatment, the samples were placed in a U-8 container or a 2L Marinelli beaker and measured using a germanium semiconductor detector. The following 62 types of γ -ray emitting radionuclides (18 naturally occurring radionuclides and 44 artificial radionuclides) were surveyed. The measured results of γ -ray emitting radionuclides were corrected for attenuation, and figures were reported as activity concentration after sampling.

Naturally radion (18 radio	occurring uclides onuclides)	Artificial radionuclides (44 radionuclides)							
Ac-228	Ra-224	Ag-108m	Co-58	I-131	Np-239	Te-129m			
Be-7	Ra-226	Ag-110m	Co-60	I-132	Ru-103	Te-132			
Bi-212	Th-227	Am-241	Cr-51	La-140	Ru-106	Y-91			
Bi-214	Th-228	As-74	Cs-134	Mn-54	Sb-124	Y-93			
K-40	Th-231	Ba-140	Cs-136	Mn-56	Sb-125	Zn-63			
Pa-234m	Th-234	Bi-207	Cs-137	Mo-99	Sb-127	Zn-65			
Pb-210	T1-206	Ce-141	Fe-59	Nb-95	Sr-91	Zr-95			
Pb-212	T1-208	Ce-143	Ga-74	Nb-97	Tc-99m	Zr-97			
Pb-214	U-235	Ce-144	Ge-75	Nd-147	Te-129				

Table 2.2-1 Surveyed γ-ray emitting radionuclides

3 Results

The outline of detectable radioactive materials at each monitoring location is as follows.

3.1 Detection of total β radioactivity and γ-ray emitting radionuclides

(1) Public water areas

1) Water

The results of the measurements of total β radioactivity and γ -ray emitting radionuclides in water samples from public water areas are as shown in Table 3.1-1 and Figure 3.1-1.

a) Total β radioactivity

The detection rate for total radioactivity was 92.0 % with detected values ranging from not detectable to 2.6 Bq/L: all of which were within the past measurement trends.

b) γ-ray emitting radionuclides

As shown in Table 3.1-1 and Figure 3.1-1, six types of γ -ray emitting radionuclides (four naturally occurring radionuclides and two artificial radionuclides) were detected, while other types of γ -ray emitting radionuclides were not detectable at any of the locations surveyed.

The detection rates of naturally occurring radionuclides were 10 % or less, except for K-40, for which the detection rate was 91.2 %. All of the measured values of naturally occurring radionuclides were within the past measurement trends.

Regarding artificial radionuclides, the detection rate for Cs-134 was 6.2 % and for Cs-137 it was 18.6 %, while the nuclide concentration of Cs-134 was 0.0055 Bq/L or less, Cs-137 was 0.031 Bq/L or less: all of which were within the past measurement trends.

								Measured	l values [B	Maximum records [Bq/L]			
Radionuclides		Number of samples	Detection times	Detection rate (%)	Range			Detection limits			Nationwide Monitoring in FY2014, FY2015	Monitoring of Levels (*1)	
Total β radioactivity			113	104	92.0	ND	-	2.6	0.023	-	0.36	4.1	0.25
ides	occurring	Ag-110m	113	103	91.2	ND	-	2.5	0.016	-	0.092	4.1	2.3
onucl		Ba-140	113	6	5.3	ND	-	0.043	0.0077	-	0.087	0.057	0.18
g radi	turally	Be-7	113	1	0.9	ND	-	0.0034	0.0020	-	0.011	0.0037	0.0048
mittin	Nat	Bi-214	113	2	1.8	ND	-	0.0054	0.0016	-	0.010	0.0076	No data
γ-ray eı	ficial	Ce-141	113	7	6.2	ND	-	0.0055	0.00078	-	0.0042	0.022	0.034
	Artii	Ce-144	113	21	18.6	ND	-	0.031	0.00074	-	0.0043	0.065	0.058

Table 3.1-1 Detection of total β radioactivity and γ -ray emitting radionuclides in water samples from public water areas

(*1) Results of the Monitoring of Environmental Radioactivity Levels and the Monitoring of the Surrounding Environment conducted in Japan nationwide from FY1997 to FY2016 (excluding data from March 11, 2011 to March 10, 2013)



(*) The vertical axis is logarithmically scaled because the magnitude of detected values varies widely depending on the type of radionuclide.

Figure 3.1-1 Detection of total β radioactivity and γ -ray emitting radionuclides in water samples from

public water areas

2) Sediments

The results for total β radioactivity and γ -ray emitting radionuclides in sediment samples from public water areas are as shown in Table 3.1-2 and Figure 3.1-2.

a) Total β radioactivity

Total β radioactivity was detected at all locations surveyed, with detected values ranging from 170 to 1,300 Bq/kg: all of which were within the past measurement trends.

b) γ-ray emitting radionuclides

As shown in Table 3.1-2 and Figure 3.1-2, 11 types of γ -ray emitting radionuclides (nine naturally occurring radionuclides and two artificial radionuclides) were detected, while no other types of γ -ray emitting radionuclides were detectable.

The detection rates of the six naturally occurring radionuclides other than Be-7, Bi-212, and Ra-226 exceeded 95%. All of the detected naturally occurring radionuclides were within the past measurement trends.

As for artificial radionuclides, the detection rates of Cs-134 and Cs-137 were 20.0% and 35.5% respectively, while detected values were 91 Bq/kg or less for Cs-134 and 510 Bq/kg or less for Cs-137: all of which were within the past measurement trends.

							М	easured va	ulues [Bq/k	[g]		Maximum reco	ords [Bq/kg]
Radionuclides		onuclides	of samples	Detection times	Detection rate (%)	Range			Detection limits			Nationwide Monitoring in FY2014, FY2015	Monitoring of Levels (*1)
To	talβ1	radioactivity	110	110	100.0	170	-	1,300	15	-	26	1,300	1,300
		K-40	110	110	100.0	140	-	1100	12	-	38	1,100	800
		Ac-228	110	107	97.3	ND	-	120	3.2	-	10	170	No data
clides	50	Be-7	110	7	6.4	ND	-	82	11	-	160	180	42
	currin	Bi-212	110	59	53.6	ND	-	130	11	-	44	200	No data
dionu	lly oc	Bi-214	110	110	100.0	2.7	-	40	1.9	-	9.5	87	ND
ing ra	atura	Pb-212	110	110	100.0	4.5	-	120	1.4	-	6.1	200	No data
emitt	Z	Pb-214	110	110	100.0	5.1	-	46	1.5	-	9.5	96	No data
γ-ray		Ra-226	110	16	14.5	ND	-	98	14	-	73	190	122
		T1-208	110	110	100.0	3.2	-	98	2.2	-	12	170	No data
	ficial	Cs-134	110	22	20.0	ND	-	91	0.80	-	4.3	260	30
	Arti	Cs-137	110	39	35.5	ND	-	510	0.82	-	3.5	780	110

Table 3.1-2 Detection of total β radioactivity and γ -ray emitting radionuclides in sediment samples from public water areas

(*1) Results of the Monitoring of Environmental Radioactivity Levels and the Monitoring of the Surrounding Environment studies conducted in Japan nationwide from FY1997 to FY2016 (excluding data from March 11, 2011 to March 10, 2013)



 (*) Details of the detection of Cs-134 and Cs-137 are explained later.
 (*) The vertical axis is logarithmically scaled because the magnitude of detected values varies widely with the type of radionuclide.

Figure 3.1-2 Detection of total β radioactivity and γ-ray emitting radionuclides in sediment samples

from public water areas

(2) Groundwater

The measurement results for total β radioactivity and γ -ray emitting radionuclides in groundwater samples are as shown in Table 3.1-3 and Figure 3.1-3.

a) Total β radioactivity

The detection rate of total β radioactivity was 88.2%, with detected values ranging from not detectable to 0.54 Bq/L. Detected values exceeded the range of past measurement records at one location, but they were attributed to K-40, and was considered to be within the past measurement trends.

b) γ-ray emitting radionuclides

Five types of γ -ray emitting radionuclides (all naturally occurring radionuclides), as shown in Table 3.1-3 and Figure 3.1-3, were detected, while no other types of γ -ray emitting radionuclides were detected. For naturally occurring radionuclides, the detection rate was less than 3% except for the detection rate of K-40 which was 84.5%. At one location, K-40 slightly exceeded the range of past measurement records, but it is usually contained in natural soil rocks etc (described below). In addition, Pb-212 slightly exceeded the range of past measurement records at one point, but it is a natural species of the thorium series and is usually contained in natural soil rocks etc. Considering that the past detected cases are based on survey results from only a few areas (Shiga prefecture, Niigata prefecture, Nara prefecture; not surveyed in the Monitoring of Environmental Radioactivity Levels), Pb-212 was assumed to be within the past measurement trends.

					tion Detection s rate (%)		М	easured v	Maximum records [Bq/L]				
Radionuclides		Number of samples	Detection times	Range			Detection limits			Nationwide Monitoring in FY2014, FY2015	Monitoring of Levels (*1)		
То	Total β radioactivity		110	97	88.2	ND	-	0.54	0.024	-	0.038	0.44	0.33
lides		K-40	110	93	84.5	ND	-	0.56	0.017	-	0.054	0.54	0.41
dionuc	curring	Ac-228	110	1	0.9	ND	-	0.015	0.0038	-	0.0096	0.038	No data
ting rae	ally oce	Bi-214	110	3	2.7	ND	-	0.0069	0.0022	-	0.0059	0.022	No data
γ-ray emitt	Natura	Pb-212	110	2	1.8	ND	-	0.0048	0.0013	-	0.0040	0.0030	No data
		Pb-214	110	2	1.8	ND	-	0.0057	0.0019	-	0.0050	0.026	No data

Table 3.1-3 Detection of total β radioactivity and γ -ray emitting radionuclides in groundwater samples

(*1) Results of the Monitoring of Environmental Radioactivity Levels and the Monitoring of the Surrounding Environment conducted in Japan nationwide from FY1997 to FY2016 (excluding data from March 11, 2011 to March 10, 2013)



(*) The vertical axis is logarithmically scaled because the magnitude of detected values varies widely with the type of radionuclide.

Figure 3.1-3 Detection of total β radioactivity and γ-ray emitting radionuclides in groundwater samples

3.2 Discussion regarding detected radionuclides

- (1) Detection of naturally occurring radionuclides
- 1) Correlation between activity concentrations of K-40 and seawater

As explained in 3.1 above, activity concentrations of K-40 were all within the past measurement trend in water samples collected in public water areas. All the locations where relatively high concentrations of K-40 were detected were located in the tide zone and the electrical conductivity (EC) was high (1,330 mS/m at the maximum). Therefore, a comparison was made using all available data to clarify the correlation between activity concentrations of K-40 and EC (see Figure 3.2-1).

As shown in Figure 3.2-1, a positive correlation was found between them.



Figure 3.2-1 Correlation between K-40 concentrations and electrical conductivity(EC) in water samples from public water areas

On the other hand, according to the results of the Monitoring of Levels, conducted for 20 years from FY1997 to FY2016 (monitoring of 744 samples collected from 19 prefectures), the average concentration (average) of K-40 was approximately 9.6 Bq/L and the maximum concentration was 15 Bq/L (see Table 3.2-1).

Table 3.2-1 Results of the Monitoring of Levels, etc., concerning K-40 in seawater (*1)

Number of surveys	Detection times	Detection rate (%)	Average (Bq/L)	Maximum (Bq/L)	
744	717	96.4	9.6	15	

(*1) Results of the Monitoring of Environmental Radioactivity Levels and the Monitoring of the Surrounding Environment conducted in Japan nationwide from FY1997 to FY2016

EC of seawater is generally around 4,500 mS/m, and the estimated activity concentrations of K-40 with possible influence of seawater were obtained by using the following formula based on the measurement results of EC for the relevant river water.

$$\begin{array}{l} \text{(Activity}\\ \text{concentration of K-}\\ 40 \text{ in river water)} \end{array} = \begin{array}{l} \text{(Average activity}\\ \text{concentration of K-40}\\ \text{in seawater)} \end{array} \times \begin{array}{l} \text{(Measured EC in the river water)}\\ \text{(Ordinary values of EC in seawater)} \end{array}$$

The estimated activity concentrations of K-40 in the river water are indicated with a dotted line (.....) in Figure 3.2-1, and the estimated values agree very well with the measured activity concentrations of K-40. Therefore, the relatively high activity levels of K-40 obtained in the latest measurements are considered to have been caused by the intrusion of seawater.

In the same manner, the correlation between K-40 concentration and EC was also investigated with regard to groundwater samples (see Figure 3.2-2, scales of the vertical and horizontal axes differ from those for Figure 3.2-1). However, no clear correlation was found from the groundwater samples. The concentrations of K-40 in groundwater samples from Site No. 77 (Himebara, Izumo City, Shimane Pref.: 0.56 Bq/L) slightly exceeded the range of past measured values (maximum value: 0.54 Bq/L). This result is considered to reflect the geological charagteristics of the monitoring area, which exhibits relatively high potassium concentrations in the soil (Figure 3.2-3). Accordingly, the K-40 concentration for groundwater samples in the latest monitoring is considered to fall within the past measurement trends.



Figure 3.2-2 Correlation between the K-40 concentration and electrical conductivity (EC) in groundwater sample



Reference: Website of the Geological Survey of Japan, AIST https://gbank.gsj.jp/geochemmap/setumei/radiation/setumei-radiation.htm



2) Uranium and thorium series radionuclides

As explained in 3.1 above, uranium and thorium series radionuclides were detected at relatively high concentration levels in sediment samples from public water areas. The detection status is shown in Table 3.2-2.

These naturally occurring radionuclides exist widely within the earth's crust and belong to the same decay series, which implies the existence of some correlations among detected values.

Radionuclides		Number of samples	Detection times	Detection rate (%)	Measured value [Bq/kg]						
						Range		Det	ection 1	limit	
γ -ray emitting radionuclides	Uranium series	Ra-226	110	16	14.5	ND	-	98	14	-	73
		Pb-214	110	110	100.0	5.1	-	46	1.5	-	9.5
		Bi-214	110	110	100.0	2.7	-	40	1.9	-	9.5
	Thorium Series	Ac-228	110	107	97.3	ND	-	120	3.2	-	10
		Pb-212	110	110	100.0	4.5	-	120	1.4	-	6.1
		Bi-212	110	59	53.6	ND	-	130	11	-	44
		T1-208	110	110	100.0	3.2	-	98	2.2	-	12

Table 3.2-2 Detection of uranium and thorium series naturally occurring radionuclides

Figure 3.2-4 and Figure 3.2-5 show the correlation among uranium series radionuclides and among thorium series radionuclides, respectively, based on the radionuclides with high detection rate (with instances of non-detection excluded). Figure 3.2-4 and Figure 3.2-5 reveals high correlations among uranium series or among thorium series radionuclides. From this information it can be inferred that the radionuclides of the two series reflected the geology of the locations at which they had been detected.

Note that it is generally accepted that granite contains larger amounts of naturally occurring radionuclides than other kinds of rocks and that natural radiation doses correlate to some extent with uranium and thorium series radionuclides (both according to the Geological Society of Japan³). For reference, Figure 3.2-6 shows the distribution map of granite in Japan, while Figure 3.2-7 shows the distribution map of natural radiation doses in Japan.

³ http://www.geosociety.jp/hazard/content0058.html



Figure 3.2-4 Correlations among uranium series radionuclides



Figure 3.2-5 Correlations among thorium series radionuclides



(*) Reference: Seamless Digital Geological Map of Japan (1:200,000) ® ; AIST website⁴ Figure 3.2-6 Distribution of granite in Japan (parts highlighted in pink in the Figure are locations where granite exists)





 ⁴ https://gbank.gsj.jp/seamless/
 ⁵ http://www.geosociety.jp/hazard/content0058.html
- (2) Detection of artificial radionuclides
- 1) Cs-134 and Cs-137 in sediments

Radioactive cesium was detected in sediment samples from public water areas in Hokkaido, Tohoku, Kanto, Chubu, Kinki, and Kyushu blocks (39 locations in total; both Cs-134 and Cs-137 were detected at 22 locations (all in Tohoku and Kanto Blocks); only Cs-137 was detected at 17 locations).

To better clarify the concentration levels of the detected radioactive cesium species, the following comparisons were made:

- (i) Wherever Post-Earthquake Monitoring is carried out at the same locations, a direct comparison between data was carried out.
- (ii) For locations that do not fall under the category of (i) above but are within the Tokyo Metropolitan Area or other prefectures where Post-Earthquake Monitoring is conducted, collected data was compared with that from other locations in the same prefecture.
- (iii) For locations that do not fall under the categories of (i) and (ii) above, collected data was compared to data from nearby locations obtained via Post-Earthquake Monitoring.
- (iv) For locations where measured values did not exceed the range of past measurement records, collected data was compared with data obtained through the Monitoring of Levels and other reports.
- (i) Comparison with the past Post-Earthquake Monitoring results for the same locations

Regarding locations where Post-Earthquake Monitoring was also conducted, the measured values in the latest monitoring were compared with the past measurement records for the same locations (see Figure 3.2-8).

All the results of the latest monitoring were found to be within the past measurement trends.



<Legend>

- •: FY2016 Nationwide Monitoring results
- •: FY2014-FY2015 Nationwide Monitoring results
- : Post-Earthquake Monitoring results
- O : Post-Earthquake Monitoring results (measurement results from March 11, 2011 to March 10, 2013 which were excluded from the past measured values used as reference data)

Figure 3.2-8 (1) (i) Comparison with past Post-Earthquake Monitoring results for the same locations [Cs-

134]



<Legend>

- FY2016 Nationwide Monitoring results
- •: FY2014-FY2015 Nationwide Monitoring results
- : Post-Earthquake Monitoring results
- O : Post-Earthquake Monitoring results (measurement results from March 11, 2011 to March 10, 2013, which were excluded from the past measured values used as reference data)

Figure 3.2-8 (2) (i) Comparison with the past Post-Earthquake Monitoring results for the same locations [Cs-137]

(ii) Comparison with the past Post-Earthquake Monitoring results in the same prefectures

For locations that have not been surveyed by Post-Earthquake Monitoring, the measured values obtained in the latest monitoring were compared with the past Post-Earthquake Monitoring results for locations in the same prefectures (see Figure 3.2-9).

The measured values from the latest monitoring were all found to be within the past measurement trends.



• Post-Earthquake Monitoring results (measurement results from March 11, 2011 to March 10, 2013 which were excluded from the past measured values used as reference data)

Figure 3.2-9 (1) (ii) Comparison with past Post-Earthquake Monitoring results in the same prefectures [Cs-134]



• : Post-Earthquake Monitoring results

• : Post-Earthquake Monitoring results (measurement results from March 11, 2011 to March 10, 2013 which were excluded from the past measured values used as reference data)

Figure 3.2-9 (2) (ii) Comparison with past Post-Earthquake Monitoring results in the same prefectures [Cs-137]

(iii) Comparison with past Post-Earthquake Monitoring results for nearby locations

Regarding Location No. 40 (Rinko Tsurumigawa Bridge, Tsurumi River, Yokohama City, Kanagawa Prefecture), it was considered reasonable to make a comparison with the past data for nearby locations although Post-Earthquake Monitoring had not been conducted in Kanagawa Prefecture. Therefore, a comparison was made with the past data for Location No. 38 (Ryogoku Bridge, Sumida River, Chuo City/Sumida City, Tokyo Metropolis) and Location No. 39 (Kasai Bridge, Arakawa River, Koto City/Edogawa City, Tokyo Metropolis), both of which are located at the mouths of the Sumida River and the Arakawa River to Tokyo Bay (see Figure 3.2-10). As a result, it was found that the measured values for Location No. 40 were within the past measurement trends.



(*) Small white diamonds and triangles show the measurement results from March 11, 2011 to March 10, 2013, which were excluded from the past measured values used as reference.



(iv) Comparison with the data obtained from the Monitoring of Levels, etc.

For locations where measured values did not exceed the range of past measurement records, the measured values obtained during the latest monitoring were compared with the data obtained through the Monitoring of Environmental Radioactivity Levels, etc. to validate the concentration levels (see Figure 3.2-11).

Cs-134 and Cs-137 were detected at Location No. 19 (Ryou Bridge, Mogami River, Sakata City, Yamagata Prefecture), Location No. 41 (Banyu Bridge, Sagami River, Hiratsuka City, Kanagawa Prefecture), and Site No.44 (Oun Bridge, Agano River, Niigata City, Niigata Prefecture). At other locations , only Cs-137 was detected and the measured values all fell within the past measurement trends.



(*) Upper: Cs-134, Lower: Cs-137

(*) A dotted line shows the day the Great East Japan Earthquake occured (March 11, 2011). White small circles show the measurement results from March 11, 2011 to March 10, 2013, which excluded from the past measured values used as reference.

Figure 3.2-11 (iv) Comparison with the data obtained through the Monitoring of Environmental Radioactivity Levels, etc.

As a reference, a good correlation was confirmed in the activity concentration ratios of Cs-137 and Cs-134 in locations where both Cs-134 and Cs-137 were detected (all in the Tohoku and Kanto blocks). The calculated activity concentration ratio was approximately 5.6 (Cs-137/Cs-134). Assuming that detected Cs-134 and Cs-137 are those discharged due to the Fukushima NPS Accident, this ratio should be approximately equal to the theoretical ratio (approx. 5.6) as of September 2016 after the discharge in March 2011 (see Figure 3.2-12). This suggests that Cs-134 and Cs-137 detected in sediment samples collected in the Tohoku and Kanto blocks were indeed derived from the Fukushima NPS Accident.



Figure 3.2-12 Concentration ratio (Cs-137/Cs-134) [Sediments (public water areas)]

(Reference: Changes in concentration ratios (Cs-137/Cs-134) over time, accounting for half-life periods)

Radionuclide	Half-life (years)	2011/3	2012/3	2013/3	2014/3	2015/3	2015/11	2016/9
Cs-134	2.0648	1	0.71	0.51	0.36	0.26	0.21	0.16
Cs-137	30.1671	1	0.98	0.96	0.93	0.91	0.90	0.88
Cs137/	Cs134	1	1.37	1.87	2.56	3.50	4.28	5.62

(*) The concentration ratio at the time of the latest monitoring (around September 2016) is estimated to be approximately 5.6 (highlighted in yellow in the table above).

Given these facts, Cs-134 and Cs-137 detected in sediment samples from public water areas were mostly derived from the Fukushima NPS Accident, except for some locations for which causal relations were unclear, but the detected values were all within the past measurement trends.

2) Cs-134 and Cs-137 in water

Cs-134 or Cs-137 were detected at 21 out of the 110 locations where water samples from public water areas were collected (a total of 21 locations: both Cs-134 and Cs-137 were detected at seven locations (all in the Tohoku and Kanto blocks) and only Cs-137 was detected at 14 locations). The maximum values were 0.0055 Bq/L for Cs-134 and 0.031 Bq/L for Cs-137. Moreover, these values fell within the range of past measured values from the Monitoring of Environmental Radioactivity Levels (max. 0.034 Bq/L for Cs-134, and max 0.058 Bq/L for Cs-137).

At the seven locations (all in the Tohoku and Kanto blocks) where both Cs-134 and Cs-137 were detected, the concentration ratio (Cs-137/Cs-134) was calculated in the same manner as with the sediment samples and also showed a good correlation. The obtained concentration ratio was approximately 5.6. Assuming that detected Cs-134 and Cs-137 were those discharged due to the Fukushima NPS Accident, this ratio should be close to the theoretical ratio (approx. 5.6) as of September 2016 after the discharge in March 2011 (see Figure 3.2-13). This suggests that Cs-134 and Cs-137 detected in water samples collected in the Tohoku and Kanto blocks were indeed derived from the Fukushima NPS Accident.



Figure 3.2-13 Concentration ratio (Cs-137/Cs-134) [Water (public water areas)]

3) Cs-134 and Cs-137 in groundwater

Cs-134 and Cs-137 were not detected in groundwater samples collected at any of the 110 locations (detection limit: approx. 0.001 to 0.002 Bq/L).

3.3 Survey to check annual variation

At two locations⁶ (both in rivers), namely, Location No. 28 (Toneozeki Weir, Tonegawa River, Chiyoda Town, Gunma Prefecture) and Location No. 83 (Kasumi Bridge, Takahashi River, Kurashiki City, Okayama Prefecture), surveys were conducted four times during the period from May 24, 2016 to January 27, 2017. These two locations had been previously surveyed four times each in FY2014 and in FY2015, and the current analysis includes the results from those prior years.

Radionuclides were detected as shown in Table 3.3-1 and Table 3.3-2. Figure 3.3-1 and 3.3-2 show the changes in radionuclides detected in and after FY2014. Table 3.3-1 and Table 3.3-2 also show the coefficients of variation⁷ (= sample standard deviation /average) indicating for the variations in detected values.

The coefficients of variation in water samples ranged from 15% to 26% for total β radioactivity and K-40, and stood at 36% for Cs-137, respectively⁸.

The coefficients of variation in sediment samples ranged from 5.2% to 27% for total β radioactivity and naturally occurring radionuclides (Ac-228, Bi-212, Bi-214, Pb-212, Pb-214, Tl-208, and K-40), and from 47 to 51% for radioactive cesium.

For reference, sediment grain size distribution and CS-137 concentration change for Location No. 28 are shown in Figure 3.3-3, and sediment grain size distribution for Location No. 83 is shown in Figure 3.3-4.

⁶ It was decided that one location each would be selected in eastern and western Japan. To make the selection, all 110 locations were first divided into two areas for convenience (Locations No. 1 to No. 55 were classified as eastern Japan and Locations No. 56 to No. 110 were classified as western Japan) and the middle number in each area was selected.

⁷ In this report: coefficient of variation = sample standard deviation divided by the average; hereinafter the same shall apply. ⁸ Fluctuations in measured radioactivity were reported when sites were sampled multiple times. For instance, the FY2012 survey shows 12 to 16 % fluctuations in the amount of radioactive cesium contained in riverbed sediments (nine samples collected during the same period). At River Site No. 28, radioactive cesium was detected in sediment, and a drop in water transparency probably due to sludge disturbance caused by pleasure boats or winds in the vicinity was observed. This changed the water and bottom sampling locations slightly, and changes in the distribution of sediment grain size was observed. Because the changes in sediment grain size distribution might have affected the concentration of radioactive cesium, the changes in sediment grain size distribution and Cs-137 concentration at River Site No. 28 are graphically summarized in Figure 3.3-3. This revealed that sediment samples with high clay and silt contents tend to have higher Cs-137 concentrations. Accordingly, it was inferred that the fluctuations in the amount of radioactive cesium in samples from River Site No. 28 had occurred due to the changes in the grain size distribution in the sediment samples.

	De l'enselider		FY:	2014			FY2	2015			FY2	2016		Coefficient
	Radionucides	Aug 25	Oct 27	Dec 15	Jan 26	Oct 13	Nov 24	Dec 25	Jan 22	May 24	Sep 15	Nov 14	Jan 20	of variation [%]
	Total β radioactivity	0.068	0.12	0.12	0.11	0.090	0.099	0.071	0.10	0.062	0.061	0.13	0.084	26
Water	K-40	0.097	0.11	0.078	0.094	0.12	0.11	0.096	0.11	0.059	0.078	0.095	0.083	18
[Bq/L]	Cs-134	0.0015	0.0020	< 0.0010	0.0018	< 0.0022	< 0.0014	< 0.0014	< 0.0014	< 0.0014	< 0.0014	< 0.0017	< 0.0013	-
	Cs-137	0.0074	0.0072	0.0048	0.0049	0.0029	0.0035	0.0043	0.0052	0.0030	0.0061	0.0035	0.0025	36
	Total β radioactivity	410	350	350	380	720	460	490	430	410	460	400	450	22
	K-40	290	330	280	280	290	370	320	320	280	300	250	260	11
	Ac-228	15	9.8	12	15	23	18	22	20	15	21	18	12	26
	Be-7	<24	<36	<38	<25	<76	<68	<44	<28	<54	59	<66	<29	-
	Bi-212	<32	<17	<28	<23	<46	<30	<21	<23	37	29	<30	<30	-
Sediment [Ba/kg]	Bi-214	<12	11	13	13	14	15	16	12	12	13	16	18	15
C 1 65	Pb-212	18	16	21	16	28	18	16	18	17	21	19	19	18
	Pb-214	11	11	16	11	14	15	17	13	19	17	18	13	19
	Tl-208	16	12	13	14	18	11	15	17	14	21	14	13	19
	Cs-134	19	13	21	17	51	25	26	21	15	26	19	11	47
	Cs-137	60	44	76	61	230	110	110	96	74	140	96	72	51

Table 3.3-1 Detection trends for radioactive materials at the same location [River No. 28]

(*) The coefficients of variation are shown only for radionuclides detected five times or more.



Water (River No. 28)

Figure 3.3-1 Changes in detection trends for radioactive materials at the same location [River No. 28]

\smallsetminus	De diama lida a		FY2	2014			FY2	2015			FY2	016		Coefficient
	Radionucides	Aug 30	Oct 28	Dec 15	Jan 26	Oct 16	Nov 30	Dec 22	Jan 25	May 30	Aug 23	Nov 15	Jan 27	of variation [%]
	Total β radioactivity	0.046	0.064	0.037	0.038	0.048	0.047	0.041	0.035	0.039	0.045	0.030	0.041	20
Water	K-40	0.034	0.045	< 0.028	0.034	0.045	0.042	0.038	0.031	0.050	0.043	0.046	0.036	15
[Bq/L]	Be-7	<0.024	0.012	<0.0073	<0.0073	<0.024	<0.018	<0.013	<0.0085	<0.011	<0.040	<0.022	<0.0078	-
	Pb-212	< 0.0019	< 0.0021	<0.0019	0.0013	<0.0019	< 0.0015	<0.0015	<0.0014	<0.0017	< 0.0015	<0.0015	< 0.0014	-
	Total β radioactivity	1000	980	890	920	1000	1000	950	940	930	1100	940	990	5.6
	K-40	870	830	910	770	920	920	840	840	840	900	840	840	5.2
	Ac-228	13	25	12	19	25	21	29	25	17	18	24	15	27
	Bi-212	42	34	23	28	28	<33	37	<34	<35	34	<28	<29	20
Sediment	Bi-214	15	21	17	17	16	19	16	19	19	14	18	14	13
[Bq/kg]	Pb-212	28	28	24	27	28	26	26	27	24	21	22	23	9.7
	Pb-214	21	23	19	15	21	20	22	18	24	16	17	17	15
	Ra-226	50	<42	36	<39	<37	<46	<44	<41	<42	<38	<42	<39	-
	Th-234	<30	<41	30	42	<31	<47	<45	<47	<160	<140	<150	<140	-
	TI-208	25	20	21	25	23	24	15	19	23	21	21	17	15

Table 3.3-2 Detection trends for radioactive materials at the same location [River No. 83]

(*) The coefficients of variation are shown only for radionuclides detected five times or more.



Figure 3.3-2 Changes in detection trends for radioactive materials at the same location [River No. 83]



Figure 3.3-3 Changes in sediment grain size distribution and Cs-137 concentration [River No. 28]



Figure 3.3-4 Changes in sediment grain size distribution [River No. 83]

Part 2: Radioactive Material Monitoring in the Water Environment in and around Fukushima Prefecture (FY2016)

1 Objective and Details

1.1 Objective

This monitoring was conducted in response to the Fukushima NPS Accident for the purpose of clarifying the distribution of the accident-derived radioactive materials in the water environment.

1.2 Details

(1) Locations

The survey was conducted mainly in the Tohoku and Kanto districts at around 600 locations for public water areas and at around 400 locations for groundwater. Specific locations are shown in Figure 1.2-1.

(2) Targets

For public water areas (rivers, lakes, and coastal areas), water and sediments were surveyed. Additionally, radioactivity in soil in the surrounding environment (river beds, etc.) near the sampling locations was also surveyed as reference.

Radioactivity in groundwater was also measured.

(3) Frequencies and periods

The monitoring for public water areas was conducted 2 to 10 times a year (varying by location). The monitoring for groundwater was conducted 1 to 4 times a year (varying by location).

(4) Conducted analyses

Primarily, analyses of Cs-134 and Cs-137 were conducted for the subject samples.

Additionally, analyses on Sr-89, Sr-90 and other artificial radionuclides were also conducted for some of the samples.

(5) Compilation and evaluation of results

The results of the measurement are compiled and released sequentially as preliminary reports on the Ministry of the Environment website.

This report is the compilation of the overall monitoring results, and the details of individual monitoring surveys are available on the following website.

Public water area: http://www.env.go.jp/en/water/rmms/surveys.html



Figure 1.2-1 Map showing locations for the Post-Earthquake Monitoring

2 Survey Methods and Analysis Methods

2.1 Survey methods

Samples were collected at predetermined locations (for public water areas and groundwater) and the following analyses of radioactive materials were conducted.

Samples were collected based on the following guidelines in principle, as outlined below.

- Water Quality Survey Method (September 30, 1971; Notice Kansuikan No. 30 issued by the Director General of the Water Quality Preservation Bureau, Ministry of the Environment)
- Sediment Survey Method (August 8, 2012; Notice Kansuitaisuihatsu No. 120725002 issued by the Director General of the Environmental Management Bureau, Ministry of the Environment)
- Groundwater Quality Survey Method (September 14, 1989; Notice Kansuikan No. 189 issued by the Director General of the Water Quality Preservation Bureau, Ministry of the Environment)
- Environmental Sample Collection Method (1983, MEXT's Radioactivity Measurement Method Series)
- Sample Pretreatment for Instrumental Analysis Using Germanium Semiconductor Detectors (1982, MEXT's Radioactivity Measurement Method Series)

2.2 Analysis methods

 γ -ray spectrometry measurements using a germanium semiconductor detector were conducted for water samples and sediment samples collected from public water areas and for groundwater samples, primarily targeting Cs-134 and Cs-137.

Additionally, analyses on Sr-89, Sr-90 and other artificial radionuclides were also conducted for some of the collected samples. Detected values were indicated with two significant digits in the unit of "Bq/L" in the case of water samples from public water areas and groundwater samples, and in the unit of "Bq/kg" in the case of sediment samples from public water areas. The measurement results were corrected for attenuation, and results were reported as activity concentrations at the time sampling was completed.

Adopted analysis methods were basically in line with the MEXT's Radioactivity Measurement Method Series. Detection limits are as shown in the table below.

Radionucl	ide	Public water areas (water)	Public water areas (sediments)	Groundwater
Radioactive c (Cs-134 and C	cesium Cs-137)	Approx. 1 Bq/L	Approx. 10 Bq/kg	Approx. 1 Bq/L
Radioactive	Sr-90	Approx. 1 Bq/L	Approx. 1 Bq/kg (0.16 to 2.9 Bq/kg)	Approx. 1 Bq/L
strontium	Sr-89	-	-	Approx. 1 Bq/L
Other artifi radionuclide	icial s (*1)	-	Ag-110m: 7 to 180 Bq/kg Sb-125: 130 to 330 Bq/kg	-

Table 2.2-1	Target values o	f detection limits	s for radionuclides	in Post-Eartho	guake Monitoring

*1: Varies by type of radionuclides; the above table shows detection limit targets for Ag-110m and Sb-125, which were detected during monitoring (see Chapter 5.2 of the main text).

3 Outlines of the Results

The results of the Post-Earthquake Monitoring conducted in Tokyo Metropolis and nine other prefectures in FY2016 are as outlined below.

3.1 Detection of radioactive cesium

Radioactive cesium (the total of Cs-134 and Cs-137) was detected as follows.

(1) Public water areas (water)

In FY2016, radioactive cesium activity concentrations ranged from not detectable to 1.7 Bq/L and had a detection rate of less than 0.1% in river water samples; from not detectable to 27 Bq/L and with a detection rate of 2.1% in lake water samples; and were not detectable in any coastal area water samples.

Since FY2011, all prefectures have shown decreasing trends in the detection rate for river water samples (11,000 or more total samples) and lake water samples (6,800 or more total samples). In prefectures other than Fukushima Prefecture, radioactive cesium has not been detected since FY2013 (see Figure 4.1-1 and Figure 4.1-2). In addition, no survey detected radioactive cesium in coastal area water samples (2,800 or more total samples).

(2) Groundwater

Radioactive cesium was not detected in any of the groundwater samples in FY2016.

Looking at the trend from FY2011 onward, radioactive cesium was detected in two samples from Fukushima Prefecture in FY2011 (detected values were 2 Bq/L and 1 Bq/L), and has not been detected in groundwater samples (5,600 or more total samples) since FY2012.

(3) Public water areas (sediments)

1) Overall trends

In FY2016, radioactive cesium activity concentrations ranged from not detectable to 8,600 Bq/kg and were detected with a detection rate of 86.3% in river sediment samples, from not detectable to 528,000 Bq/kg and with a detection rate of 99.3% in lake sediment samples, and from not detectable to 780 Bq/kg and at a detection rate of 78.7% in coastal area sediment samples.

2) Status by location

Because radioactive cesium was detected at many locations, its statuses in respective locations were compared. The status in respective locations were compared and detected concentration levels and their changes were statistically compiled as shown in "4.3 Detection of radioactive materials in sediments by location."

Detected concentration levels were compiled as shown in Table 3.1-1.

Locations of Categories A and B (top 10 percentile of the whole) were observed in Hamadori District, Fukushima Prefecture as well as in Nakadori and Aizu District, Fukushima Prefecture and in Ibaraki, Gunma, Chiba, and Miyagi Prefectures.

Table 3.1-1 Categorization of detected concentration levels for sediment samples from public waterareas (FY2016) (rivers, lakes, and coastal areas)

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		Range						1	Number of	locations					
Category	(see Figure 4 3-1)	[coastal area sediments]	Invoto	Minogi		Fukushima		Iboroki	Toohigi	Gumma	Chibo	Saitama	Tolaro	Total	
	(see Figure 4.5 T)	[Bq/kg (dry)]	Iwate	wnyagi	Hamadori	Nakadori	Aizu	прагакі	Tochigi	Guinna	Chiba	Saltama	Токуо	Number of location	Percentage
А	Upper 5 percentile	839 or more	0	0	11	0	0	2	0	0	6	0	0	19	4.8
В	Upper 5 to 10 percentile	436 - 839	0	0	7	2	1	1	0	1	8	0	0	20	5.1
С	Upper 10 to 25 percentile	159 - 436	0	5	14	9	1	13	1	0	17	0	1	61	15.4
D	D Upper 25 to 50 percentile 51 - 159			17	11	14	4	19	10	7	12	0	1	98	24.7
Е	Lower 50 percentile	19	21	10	19	20	18	45	40	4	2	0	198	50.0	
	Tota	1	22	43	53	44	26	53	56	48	47	2	2	396	100.0

<Lakes>

		Range					Numb	er of locat	tions			
Category	(see Figure 4.3-1)	[Lake sediments]	Miyagi		Fukushima	L	Ibaraki	Tochigi	Gunma	Chiba	Total	
	(see Figure 4.5 T)	[Bq/kg (dry)]	wiiyagi	Hamadori	Nakadori	Aizu	IUalaki	Tochigi	Guinna	Ciliba	Number of locations	Percentage
A	Upper 5 percentile	20,516 or more	0	8	0	0	0	0	0	0	8	4.9
В	Upper 5 to 10 percentile	9,265 ~ 20,516	0	8	0	0	0	0	0	0	8	4.9
С	Upper 10 to 25 percentile	2,085 ~ 9,265	1	11	4	7	1	0	0	1	25	15.2
D	$\begin{array}{c c} & & \\ \hline \\ \hline$		3	9	5	2	5	3	13	1	41	25.0
Е	Lower 50 percentile 530 or less			5	3	22	13	5	11	6	82	50.0
	Total		21	41	12	31	19	8	24	8	164	100.0

<Coastal areas>

	р1	Range				Number	of locations			
Category	(see Figure 4 3-1)	[coastal area sediments]	Iwate	Miyagi	Fukushima	Ibaraki	Chiba	Tokyo	Total	
	(see Figure 4.5 T)	[Bq/kg (dry)]	Iwate	wiiyagi	Tukushiina	IUalaki	Chiba	Токуо	Number of location	Percentage
А	Upper 5 percentile	420 or more	0	1	1	0	0	0	2	4.8
В	Upper 5 to 10 percentile	347 ~ 420	0	1	1	0	0	0	2	4.8
С	Upper 10 to 25 percentile	197 ~ 347	0	2	3	0	0	1	6	14.3
D	Upper 25 to 50 percentile	36 ~ 197	0	3	5	0	1	2	11	26.2
Е	Lower 50 percentile	36 or less	2	5	5	5	4	0	21	50.0
	Tota	1	2	12	15	5	5	3	42	100.0

Changes in detected concentration levels were compiled as shown in Figure 3.1-1, which shows Table 4.3-45 (described later) graphically.

At most monitoring locations for rivers, a decreasing trend was observed. For lakes, a decreasing or unchanged trend was generally observed with some locations showing fluctuations. For coastal areas, a decreasing or unchanged trend was observed at most locations with some locations showing fluctuations.







Figure 3.1-1 Changes in detected concentration levels of radioactive materials in sediment samples from public water areas (rivers, lakes, and coastal areas)

3.2 Detection of radionuclides other than radioactive cesium

(1) Sr-89 and Sr-90

Sr-90 was surveyed from FY2011 to FY2016 for sediment samples (approximately 640 samples in total) from public water areas (rivers, lakes, and coastal areas) and for groundwater samples (approximately 290 samples in total) (see Figure 5.1-1). Additionally, in FY2016, water samples (45 samples mainly targeting lakes) were also surveyed at those locations where relatively high concentrations were detected in sediment.

The results of the FY2016 survey were as follows: for public water area sediment samples, Sr-90 concentrations ranged from not detectable to 0.69 Bq/kg and had a detection rate of 52.2% in river sediments; from not detectable to 100 Bq/kg with a detection rate of 98.5% in lake sediments, and from not detectable to 0.38 with a detection rate of 6.3% in coastal area sediments. As for water samples, Sr-90 was not detected in any public water areas or ground water locations.

Sr-89 was not detectable in any of the monitoring surveys conducted for sediment samples from public water areas (a total of 22 samples collected from rivers and lakes in FY2011) or for groundwater samples (a total of approx. 290 samples surveyed from FY2011 to FY2016) (detection limit: 1 Bq/L for water and approximate 2 Bq/kg for sediments).

(2) Other artificial radionuclides

None have been detected since FY 2013.

4 Results (Radioactive cesium)

4.1 Water

- (1) Public water areas
- 1) Rivers

Detection of radioactive cesium in river water samples is as shown in Table 4.1-1 and Figure 4.1-1.

According to the results, most prefectures have shown decreasing trends in the detection rate since FY2011. In FY2016, radioactive cesium was not detected in any locations other than Hamadori District, Fukushima Prefecture.

Detected values (the total of Cs-134 and Cs-137) have also shown decreasing trends since FY2011. The measured values in FY2016 ranged from not detectable to 1.7 Bq/L (detection limit: 1 Bq/L for both Cs-134 and Cs-137).

2) Lakes

Detection of radioactive cesium in lake water samples is as shown in Table 4.1-2 and Figure 4.1-2.

According to the results most prefectures have shown decreasing trends in the detection rate since FY2012. Radioactive cesium has not been detected in any locations other than Hamadori District, Fukushima Prefecture since FY2013.

Detected values (the total of Cs-134 and Cs-137) have shown decreasing trends since FY2012. The measured values in FY2016 ranged from not detectable to 27 Bq/L (detection limit: 1 Bq/L for both Cs-134 and Cs-137).

3) Coastal areas

Detection of radioactive cesium (Cs-134 and Cs-137) in coastal area water samples is as shown in Table 4.1-3. According to the results, including the past fiscal years, radioactive cesium has not been detected in any locations (detection limit: 1 Bq/L for both Cs-134 and Cs-137).

(2) Groundwater

Detection of radioactive cesium in groundwater smples is as shown in Table 4.1-4.

According to the results, radioactive cesium has not been detected in any locations since FY2012 including FY2016.

<Reference>

 Specification and Standards for Food, Food Additives, etc. in Accordance with the Food Sanitation Act (Drinking Water) (Ministry of Health, Labor and Welfare Public Notice No.130, March 15, 2012)

Radioactive cesium (the total of Cs-134 and Cs-137): 10 Bq/kg $\,$

Target Values for Radioactive Materials in Tap Water (Management Target for Water Supply Facilities) (March 5, 2012; 0305 Notice No.1 from the Director of the Water Supply Division, Health Service Bureau, Ministry of Health, Labor and Welfare)

Radioactive cesium (the total of Cs-134 and Cs-137): 10 Bq/kg

			Η	FY2011					FY2012						FY2013			
Prefe	ecture	Number of samples	Detection times	Detection rate (%)	Range of values	measured (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range valu	of mea ies (Bq	sured /L)	Number of samples	Detection times	Detection rate (%)	Range valı	of mea ies (Bo	asured J/L)
Iw	ate	18	0	0.0	N	D	64	0	0.0		ND		80	0	0.0		ND	
Yam	agata	10	0	0.0	N	D	0	0	-		-		0	0	-		-	
Mi	yagi	114	0	0.0	N	D	204	3	1.5	ND	-	6.3	193	0	0.0		ND	
Fuku	shima	452	28	6.2	ND	- 20	854	18	2.1	ND	-	4.6	801	7	0.9	ND	-	5.5
	Hamadori	192	23	12.0	ND	- 20	342	12	3.5	ND	-	4.6	325	7	2.2	ND	-	5.5
	Nakadori	176	5	2.8	ND	- 8.0	355	6	1.7	ND	-	1.9	322	0	0.0		ND	
	Aizu	84	0	0.0	N	D	157	0	0.0		ND		154	0	0.0		ND	
Iba	raki	128	0	0.0	N	D	214	0	0.0		ND		212	0	0.0		ND	
To	chigi	161	1	0.6	ND	· 1.0	277	0	0.0		ND		276	0	0.0		ND	
Gu	nma	90	0	0.0	N	D	216	0	0.0		ND		214	0	0.0		ND	
Sai	ama	2	0	0.0	N	D	8	0	0.0		ND		8	0	0.0		ND	
Cl	niba	82	0	0.0	N	D	202	2	1.0	ND	-	1.3	200	0	0.0		ND	
То	kyo	3	0	0.0	N	D	12	0	0.0		ND		8	0	0.0		ND	
Te	otal	1,060	29	2.7	ND	- 20	2,051	23	1.1	ND	-	6.3	1,992	7	0.4	ND	-	5.5

Table 4.1-1(1) Detection of radioactive cesium in river water samples (from FY2011 to FY2013)

				FY2014					FY2015						FY2016					Total			
Prefe	ecture	Number of samples	Detection times	Detection rate (%)	Range of me values (B	asured q/L)	Number of samples	Detection times	Detection rate (%)	Range o value	of mea es (Bq/	sured L)	Number of samples	Detection times	Detection rate (%)	Range val	e of mea ues (Bq	sured /L)	Number of samples	Detection times	R meas	ange o ured v (Bq/L)	f alues
Iw	ate	80	0	0.0	ND		80	0	0.0		ND		80	0	0.0		ND		402	0		ND	
Yam	agata	0	0	-	-		0	0	-		-		0	0	-		-		10	0		ND	
Mi	yagi	196	0	0.0	ND		196	0	0.0		ND		196	0	0.0		ND		1099	3	ND	-	6.3
Fuku	shima	770	3	0.4	ND -	1.6	819	2	0.2	ND	-	1.3	809	1	0.1	ND	-	1.7	4,505	59	ND	-	20
	Hamadori	326	3	0.9	ND -	1.6	330	1	0.3	ND	-	1.3	326	1	0.3	ND	-	1.7	1,841	47	ND	-	20
	Nakadori	324	0	0.0	ND		324	1	0.3	ND	-	1.1	324	0	0.0		ND		1,825	12	ND	-	8.0
	Aizu	120	0	0.0	ND		165	0	0.0		ND		159	0	0.0		ND		839	0		ND	
Iba	raki	212	0	0.0	ND		212	0	0.0		ND		212	0	0.0		ND		1190	0		ND	
То	chigi	274	0	0.0	ND		278	0	0.0		ND		278	0	0.0		ND		1,544	1	ND	-	1.0
Gu	nma	210	0	0.0	ND		214	0	0.0		ND		213	0	0.0		ND		1157	0		ND	
Sai	ama	8	0	0.0	ND		8	0	0.0		ND		8	0	0.0	1	ND		42	0		ND	
Cl	niba	200	0	0.0	ND		200	0	0.0		ND		200	0	0.0		ND		1084	2	ND	-	1.3
То	kyo	8	0	0.0	ND		8	0	0.0		ND		8	0	0.0		ND		47	0		ND	
Te	otal	1,958	3	0.2	ND -	1.6	2,015	2	0.1	ND	-	1.3	2,004	1	0.0	ND	-	1.7	11,080	65	ND	-	20



Figure 4.1-1 Detection rates of radioactive cesium in river water samples (top) and changes in detected values (middle and bottom)

			Ι	FY2011						FY2012						FY2013			
Prefe	ecture	Number of samples	Detection times	Detection rate (%)	Range valu	of mea les (Bq	asured /L)	Number of samples	Detection times	Detection rate (%)	Range valı	of me ues (Bo	asured /L)	Number of samples	Detection times	Detection rate (%)	Range valı	of mea 1es (Bq	isured /L)
Yam	agata	4	0	0.0		ND		0	0	-		-		0	0	-		-	
Mi	yagi	34	1	2.9	ND	-	3.0	90	0	0.0		ND		118	0	0.0		ND	
Fuku	shima	211	11	5.2	ND	-	27	581	72	12.4	ND	-	100	761	36	4.7	ND	-	47
	Hamadori	76	9	11.8	ND	-	27	272	65	23.9	ND	-	100	321	36	11.2	ND	-	47
	Nakadori	56	2	3.6	ND	-	5.0	83	3	3.6	ND	-	1.2	109	0	0.0		ND	
	Aizu	79	0	0.0		ND		226	4	1.8	ND	-	5.1	331	0	0.0		ND	
Iba	raki	48	0	0.0		ND		93	0	0.0		ND		152	0	0.0		ND	
То	chigi	24	0	0.0		ND		54	0	0.0		ND		62	0	0.0		ND	
Gu	nma	51	0	0.0		ND		144	1	0.7	ND	-	1.0	188	0	0.0		ND	
Cł	niba	32	0	0.0		ND		50	0	0.0		ND		53	0	0.0		ND	
Te	otal	404	12	3.0	ND	-	27	1,012	73	7.2	ND	-	100	1,334	36	2.7	ND	-	47

Table 4.1-2(1) Detection of radioactive cesium in lake water samples (from FY2011 to FY2013)

Table 4.1-2(2)	Detection of	radioactive	cesium in I	ake water sam	ples (fi	rom FY20	14 to FY2	016)
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				FY2014						FY2015						FY2016				Tota	1		
Prefe	cture	Number of samples	Detection times	Detection rate (%)	Range val	of mea ues (Bq	sured L)	Number of samples	Detection times	Detection rate (%)	Range valı	of mea ues (Bq	sured /L)	Number of samples	Detection times	Detection rate (%)	Range valı	of measured ues (Bq/L)	Number of samples	Detection times	Range valu	of mea 1es (Bq	isured /L)
Yam	agata	0	0	-		-		0	0	-		-		0	0	-		-	4	0		ND	
Mi	yagi	114	0	0.0		ND		118	0	0.0		ND		117	0	0.0		ND	591	1	ND	-	3.0
Fuku	shima	799	29	3.6	ND	-	34	807	29	3.6	ND	-	52	797	28	3.5	ND	- 27	3,956	205	ND	-	100
	Hamadori	342	29	8.5	ND	-	34	350	29	8.3	ND	-	52	357	28	7.8	ND	- 27	1,718	196	ND	-	100
	Nakadori	113	0	0.0		ND		115	0	0.0		ND		105	0	0.0		ND	581	5	ND	-	5.0
	Aizu	344	0	0.0		ND		342	0	0.0		ND		335	0	0.0		ND	1,657	4	ND	-	5.1
Iba	raki	152	0	0.0		ND		149	0	0.0		ND		147	0	0.0		ND	741	0		ND	
Toc	higi	64	0	0.0		ND		64	0	0.0		ND		64	0	0.0		ND	332	0		ND	
Gui	ıma	187	0	0.0		ND		192	0	0.0		ND		190	0	0.0		ND	952	1	ND	-	1.0
Ch	iba	50	0	0.0		ND		37	0	0.0		ND		37	0	0.0		ND	259	0	00000000000	ND	
То	otal	1,366	29	2.1	ND	-	34	1,367	29	2.1	ND	-	52	1,352	28	2.1	ND	- 27	6,835	207	ND	-	100



Figure 4.1-2 Detection rates of radioactive cesium in lake water samples (top) and changes in detected values (middle and bottom)

		F	Y2011			F	Y2012			F	Y2013	
Prefecture	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)
Iwate	5	0	0.0	ND	8	0	0.0	ND	8	0	0.0	ND
Miyagi	94	0	0.0	ND	96	0	0.0	ND	102	0	0.0	ND
Fukushima	116	0	0.0	ND	189	0	0.0	ND	300	0	0.0	ND
Ibaraki	45	0	0.0	ND	62	0	0.0	ND	40	0	0.0	ND
Chiba	0	0	-	-	62	0	0.0	ND	46	0	0.0	ND
Tokyo	0	0	-	-	38	0	0.0	ND	36	0	0.0	ND
Total	260	0	0.0	ND	455	0	0.0	ND	532	0	0.0	ND

Table 4.1-3(1) Detection of radioactive cesium in coastal area water samples (from FY2011 to FY2013)

Table 4.1-3(2) Detection of radioactive cesium in coastal area water samples (from FY2014 to FY2016)

		H	FY2014			F	FY2015			Η	FY2016	· · · · · · · · · · · · · · · · · · ·		Total	
Prefecture	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Range of measured values (Bq/L)
Iwate	8	0	0.0	ND	8	0	0.0	ND	8	0	0.0	ND	45	0	ND
Miyagi	104	0	0.0	ND	104	0	0.0	ND	104	0	0.0	ND	604	0	ND
Fukushima	300	0	0.0	ND	300	0	0.0	ND	300	0	0.0	ND	1,505	0	ND
Ibaraki	40	0	0.0	ND	40	0	0.0	ND	40	0	0.0	ND	267	0	ND
Chiba	46	0	0.0	ND	46	0	0.0	ND	46	0	0.0	ND	246	0	ND
Tokyo	36	0	0.0	ND	36	0	0.0	ND	36	0	0.0	ND	182	0	ND
Total	534	0	0.0	ND	534	0	0.0	ND	534	0	0.0	ND	2,849	0	ND

		Η	FY2011				FY2012				FY2013	
Prefecture	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)
Iwate	42	0	0.0	ND	44	0	0.0	ND	44	0	0.0	ND
Miyagi	79	0	0.0	ND	44	0	0.0	ND	48	0	0.0	ND
Yamagata	79	0	0.0	ND	0	0	-	-	0	0	-	-
Fukushima	540	2	0.4	ND - 2.0	543	0	0.0	ND	766	0	0.0	ND
Ibaraki	89	0	0.0	ND	54	0	0.0	ND	54	0	0.0	ND
Tochigi	76	0	0.0	ND	54	0	0.0	ND	54	0	0.0	ND
Gunma	40	0	0.0	ND	40	0	0.0	ND	42	0	0.0	ND
Chiba	54	0	0.0	ND	46	0	0.0	ND	46	0	0.0	ND
Total	999	2	0.2	ND - 2.0	825	0	0.0	ND	1,054	0	0.0	ND

Table 4.1-4(1) Detection of radioactive cesium in groundwater samples (from FY2011 to FY2013)

Table 4.1-4(2) Detection of radioactive cesium in groundwater samples (from FY2014 to FY2016)

			FY2014				FY2015	· · ·			FY2016			Tota	1
Prefecture	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L)	Number of samples	Detection times	Range of measured values (Bq/L)
Iwate	22	0	0.0	ND	22	0	0.0	ND	22	0	0.0	ND	196	0	ND
Miyagi	24	0	0.0	ND	24	0	0.0	ND	24	0	0.0	ND	243	0	ND
Yamagata	0	0	-	-	0	0	-	-	0	0	-	-	79	0	ND
Fukushima	771	0	0.0	ND	775	0	0.0	ND	773	0	0.0	ND	4,168	2	ND - 2.0
Ibaraki	27	0	0.0	ND	27	0	0.0	ND	27	0	0.0	ND	278	0	ND
Tochigi	27	0	0.0	ND	27	0	0.0	ND	27	0	0.0	ND	265	0	ND
Gunma	21	0	0.0	ND	21	0	0.0	ND	21	0	0.0	ND	185	0	ND
Chiba	23	0	0.0	ND	23	0	0.0	ND	23	0	0.0	ND	215	0	ND
Total	915	0	0.0	ND	919	0	0.0	ND	917	0	0.0	ND	5,629	2	ND - 2.0

(*) Detected in FY2011. Both Cs-134 and Cs-137 were detected at one site, and only Cs-137 was detected at another site, at a level of 1 Bq/L (detection limit: 1 Bq/L) (see the main text).

4.2 Sediments

Detection of radioactive cesium in sediment samples from public water areas (rivers, lakes, and coastal areas) is as outlined below.

(1) Public water areas (rivers)

Radioactive cesium detected in river sediment samples is as shown in Table 4.2-1 and Figure 4.2-1.

According to the results, including the past fiscal years, the detection rate has ranged between 50 and 100% and has been slightly decreasing over time in many prefectures.

On the other hand, as for detected values (the total of Cs-134 and Cs-137) shown in Figure 4.2-1, the number of locations with high concentration levels has decreased while number of locations with low concentration levels has increased.

(2) Public water areas (lakes)

Detection of radioactive cesium in lake sediment samples is as shown in Table 4.2-2 and Figure 4.2-2.

According to the results, including the past fiscal years, the detection rate has ranged between 83 and 100%. In FY2016, detection rates of 90% or more were observed in all prefectures.

Detected values (the total of Cs-134 and Cs-137) have generally decreased or unchanged with some locations showing fluctuations. In Hamadori District, Fukushima Prefecture, however, radioactive cesium was still detected at concentrations of 100,000 Bq/kg or more in FY2016.

(3) Public water areas (coastal areas)

Detection of radioactive cesium in coastal area sediment samples is as shown in Table

4.2-3 and Figure 4.2-3.

According to the results, including the past fiscal years, the detection rate ranged between 30 and 100% and slightly decreased in FY2016, except for a small number of samples from Iwate Prefecture.

Coastal area locations showed lower detected values (the total of Cs-134 and Cs-137) than those in rivers or lakes. Radioactive cesium was not detected with a value of 1,000 Bq/kg or more in any prefectures in FY2016.

		F	Y2011			F	Y2012			F	Y2013	
	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)
Iwate	18	18	100.0	62 - 990	64	63	98.4	ND - 1,040	80	71	88.8	ND - 340
Yamagata	10	6	60.0	ND - 132	0	0	-	-	0	0	-	-
Miyagi	113	111	98.2	ND - 11,100	199	191	96.0	ND - 3,700	192	182	94.8	ND - 2,450
Fukushima	441	421	95.5	ND - 92,000	847	808	95.4	ND - 165,000	795	750	94.3	ND - 45,000
Hamadori	192	191	99.5	ND - 92,000	336	329	97.9	ND - 165,000	325	321	98.8	ND - 45,000
Nakadori	176	174	98.9	ND - 30,000	354	353	99.7	ND - 20,000	316	316	100.0	10 - 8,300
Aizu	73	56	76.7	ND - 25,000	157	126	80.3	ND - 2,590	154	113	73.4	ND - 1,410
Ibaraki	128	125	97.7	ND - 5,800	214	208	97.2	ND - 4,800	212	209	98.6	ND - 4,200
Tochigi	159	150	94.3	ND - 4,900	275	267	97.1	ND - 1,780	276	245	88.8	ND - 1,540
Gunma	88	74	84.1	ND - 410	211	184	87.2	ND - 1,560	214	179	83.6	ND - 1,560
Saitama	2	2	100.0	35 - 530	8	8	100.0	12 - 540	8	8	100.0	10 - 67
Chiba	83	83	100.0	50 - 9,700	199	199	100.0	17 - 20,200	200	199	99.5	ND - 7,900
Tokyo	2	2	100.0	580 - 700	12	12	100.0	131 - 670	8	8	100.0	75 - 460
Total	1,044	992	95.0	ND - 92,000	2,029	1,940	95.6	ND - 165,000	1,985	1,851	93.2	ND - 45,000

Table 4.2-1(1) Detection of radioactive cesium in river sediment samples (from FY2011 to FY2013)

Table 4.2-1(2) Detection of radioactive cesium in river sediment samples (from FY2014 to FY2016)

		FY2014				F	Y2015			F	Y2016			Total	
	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Range of measured values (Bq/kg)
Iwate	80	68	85.0	ND - 301	80	60	75	ND - 121	80	67	83.8	ND - 161	402	347	ND - 1,040
Yamagata	0	0	-	-	0	0	-	-	0	0	-	-	10	6	ND - 132
Miyagi	196	187	95.4	ND - 1,620	196	176	90	ND - 1,860	196	172	87.8	ND - 1,070	1,092	1,019	ND - 11,100
Fukushima	770	724	94.0	ND - 24,700	845	776	92	ND - 20,100	805	741	92.0	ND - 8,600	4,503	4,220	ND - 165,000
Hamadori	326	318	97.5	ND - 24,700	358	354	99	ND - 20,100	326	319	97.9	ND - 8,600	1,863	1,832	ND - 165,000
Nakadori	324	317	97.8	ND - 3,060	324	316	98	ND - 3,270	324	318	98.1	ND - 1,510	1,818	1,794	ND - 30,000
Aizu	120	89	74.2	ND - 720	163	106	65	ND - 810	155	104	67.1	ND - 810	822	594	ND - 25,000
Ibaraki	212	208	98.1	ND - 1,640	212	203	96	ND - 2,160	212	202	95.3	ND - 1,900	1,190	1,155	ND - 5,800
Tochigi	274	231	84.3	ND - 820	278	212	76	ND - 1,010	278	192	69.1	ND - 245	1,540	1,297	ND - 4,900
Gunma	210	177	84.3	ND - 2,160	214	161	75	ND - 1,510	213	142	66.7	ND - 1,100	1,150	917	ND - 2,160
Saitama	8	7	87.5	ND - 68	8	4	50	ND - 291	8	4	50.0	ND - 43	42	33	ND - 540
Chiba	200	200	100.0	11 - 5,200	200	199	100	ND - 4,100	200	198	99.0	ND - 4,130	1,082	1,078	ND - 20,200
Tokyo	8	8	100.0	96 - 430	8	8	100	86 - 404	8	8	100.0	27 - 253	46	46	27 - 700
Total	1,958	1,810	92.4	ND - 24,700	2,041	1,799	88.1	ND - 20,100	2,000	1,726	86.3	ND - 8,600	11,057	10,118	ND - 165,000



Prefectures where only a small number of samples were collected are omitted.

Figure 4.2-1 Detection of radioactive cesium in river sediment samples (changes)

			FY2011					FY2012						FY2013			
Prefecture	Number of samples	Detection times	Detection rate (%)	Range valu	of measured les (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range valu	of me ues (Bo	easured q/kg)	Number of samples	Detection times	Detection rate (%)	Rang va	ge of m lues (E	easured 8q/kg)
Yamagata	2	2	100.0	34	- 470	0	0	-		-		0	0	-		-	
Miyagi	24	24	100.0	31	- 3,000	58	57	98.3	ND	-	9,700	76	76	100.0	18	-	4,200
Fukushima	147	141	95.9	ND	- 260,000	389	386	99.2	ND	-	780,000	501	499	99.6	ND	-	460,000
Hamadori	62	62	100.0	45	- 260,000	201	201	100.0	42	-	780,000	239	239	100.0	68	-	460,000
Nakadori	42	41	97.6	ND	- 35,000	58	58	100.0	63	-	24,900	77	77	100.0	68	-	11,100
Aizu	43	38	88.4	ND	- 2,020	130	127	97.7	ND	-	10,200	185	183	98.9	ND	-	13,400
Ibaraki	24	24	100.0	37	- 1,840	48	48	100.0	93	-	1,300	76	75	98.7	ND	-	5,400
Tochigi	12	10	83.3	ND	- 6,700	27	27	100.0	11	-	4,100	31	31	100.0	106	-	5,100
Gunma	26	22	84.6	ND	- 4,600	72	72	100.0	16	-	4,100	95	95	100.0	21	-	4,300
Chiba	16	16	100.0	440	- 7,400	32	32	100.0	460	-	8,200	32	32	100.0	151	-	5,700
Total	251	239	95.2	ND	- 260,000	626	622	99.4	ND	-	780,000	811	808	99.6	ND	-	460,000

Table 4.2-2(1) Detection of radioactive cesium in lake sediment samples (from FY2011 to FY2013)

Table 4.2-2(2) Detection of radioactive cesium in lake sediment samples (from FY2014 to FY2016)

				FY2014						FY2015						FY2016					Tot	al		
Pı	efecture	Number of samples	Detection times	Detection rate (%)	Range valu	of m ies (B	easured q/kg)	Number of samples	Detection times	Detection rate (%)	Range valu	of m ies (E	neasured 3q/kg)	Number of samples	Detection times	Detection rate (%)	Rang va	e of m lues (B	easured q/kg)	Number of samples	Detection times	Range valu	of m es (B	easured q/kg)
Y	amagata	0	0	-		-		0	0	-		-		0	0	-		-		2	2	34	-	470
	Miyagi	75	74	98.7	ND	-	2,220	76	74	97.4	ND	-	4,490	76	76	100.0	12	-	3,680	385	381	ND	-	9,700
Fu	ıkushima	501	496	99.0	ND	-	297,000	541	535	98.9	ND	-	920,000	509	503	98.8	ND	-	528,000	2,588	2,560	ND	-	920,000
	Hamadori	243	243	100.0	18	-	297,000	278	278	100.0	16	-	920,000	252	251	99.6	ND	-	528,000	1,275	1,274	16	-	920,000
	Nakadori	76	74	97.4	ND	-	10,900	78	78	100.0	44	-	6,200	71	71	100.0	23	-	7,700	402	399	ND	-	35,000
	Aizu	182	179	98.4	ND	-	7,800	185	179	96.8	ND	-	12,300	186	181	97.3	ND	-	15,400	911	887	ND	-	15,400
	Ibaraki	76	75	98.7	ND	-	3,170	73	73	100.0	61	-	3,070	76	76	100.0	23	-	2,750	373	371	ND	-	5,400
	Гochigi	32	32	100.0	134	-	8,700	32	32	100.0	103	-	1,760	32	32	100.0	44	-	1,790	166	164	ND	-	8,700
(Gunma	94	94	100.0	38	-	5,100	96	96	100.0	47	-	4,570	96	96	100.0	26	-	2,510	479	475	ND	-	5,100
	Chiba	32	32	100.0	121	-	5,700	32	32	100.0	187	-	4,240	32	32	100.0	66	-	2,520	176	176	121	-	8,200
	Total	810	803	99.1	ND	-	297,000	850	842	99.1	ND	-	920,000	821	815	99.3	ND	-	528,000	4,169	4,129	ND	-	920,000



Figure 4.2-2 Detection of radioactive cesium in lake sediment samples (changes)

		H	FY2011				FY2012			F	Y2013		
Prefecture	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range measured (Bq/kg	of values g)
Iwate	3	0	0.0	ND	4	2	50.0	ND - 39	4	2	50.0	ND -	46
Miyagi	52	34	65.4	ND - 830	48	38	79.2	ND - 1,530	51	47	92.2	ND -	2,040
Fukushima	80	77	96.3	ND - 1,240	97	93	95.9	ND - 1,110	150	145	96.7	ND -	1,600
Ibaraki	28	27	96.4	ND - 230	31	17	54.8	ND - 69	20	11	55.0	ND -	67
Chiba	0	0	-	-	31	20	64.5	ND - 134	23	14	60.9	ND -	54
Tokyo	0	0	-	-	19	17	89.5	ND - 780	18	18	100.0	12 -	780
Total	163	138	84.7	ND - 1,240	230	187	81.3	ND - 1,530	266	237	89.1	ND -	2,040

Table 4.2-3(1) Detection of radioactive cesium in coastal area sediment samples (from FY2011 to FY2013)

Table 4.2-3(2) Detection of radioactive cesium in coastal area sediment samples (from FY2014 to FY2016)

		H	FY2014]	FY2015			F	Y2016			Total	
Prefecture	Number of samples	Detection times	Detection rate (%)	Ran meas values	ge of sured (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/kg)	Number of samples	Detection times	Range of measured values (Bq/kg)
Iwate	4	2	50.0	ND -	16	4	1	25.0	ND - 10	4	1	25.0	ND - 12	23	8	ND - 46
Miyagi	52	42	80.8	ND -	1,090	52	41	78.8	ND - 910	52	38	73.1	ND - 710	307	240	ND - 2,040
Fukushima	150	139	92.7	ND -	830	150	140	93.3	ND - 2,950	150	136	90.7	ND - 780	777	730	ND - 2,950
Ibaraki	20	11	55.0	ND -	67	20	8	40.0	ND - 178	20	6	30.0	ND - 49	139	80	ND - 230
Chiba	23	14	60.9	ND -	21	23	11	47.8	ND - 315	23	11	47.8	ND - 71	123	70	ND - 315
Tokyo	18	17	94.4	ND -	630	18	18	100.0	83 - 410	18	18	100.0	81 - 304	91	88	ND - 780
Total	267	225	84.3	ND -	1,090	267	219	82.0	ND - 2,950	267	210	78.7	ND - 780	1,460	1,216	ND - 2,950



Figure 4.2-3 Detection of radioactive cesium in coastal area sediment samples (Changes)

4.3 Detection of radioactive materials in sediments by location

(1) Evaluation policy

Circumstances where radioactive materials were detected were compiled in further detail by sampling location, while separately considering the property such as rivers, lakes and coastal areas.

Circumstances for each location were statistically analyzed from the following two perspectives by using all available data for each location. Locations where the survey was completed in a single fiscal year and Yamagata Prefecture, where the survey has not been conducted since 2012, were excluded from the evaluation.

1) Relative detected concentration levels

- i. Obtain the average value for each location in FY2016 by using all survey results concerning concentrations of radioactive cesium (the total of Cs-134 and Cs-137) (arithmetic average calculated by assuming ND (not detectable) to be zero; hereinafter referred to as the "average for each location").
- ii. Arrange all such averages for each location (separately for samples from rivers, lakes, and coastal areas) in descending order and set the following five categories depending on upper percentile ranges (see Figure 4.3-1).
 - Category A: Upper 5 percentile of the entirety
 - · Category B: Upper 5 to 10 percentile of the entirety
 - · Category C: Upper 10 to 25 percentile of the entirety
 - Category D: Upper 25 to 50 percentile of the entirety
 - Category E: Upper 50 to 100 percentile of the entirety (lower 50 percentile)

(Incidentally, a comparison between the average and the maximum value for each location for FY2016 revealed a good correlation (see right below of Figure 4.3-1). Therefore, considering that the evaluation of the average for each location covers that of large detected values (maximum values) that emerge occasionally, the evaluation was conducted by using only the average for each location.)

2) Changes in detected values

- i. Changes in detected values were categorized based on the following policy in order to evaluate their changes over the years.
 - (i) Based on graphs showing changes in detected values of each location over the years, those negatively sloped are set as "decreasing" and those positively sloped are set as "increasing" respectively by eye measurement.
 - (ii) When eye measurement is difficult, a regression analysis is conducted to check the trend. Specifically, when the lower and upper 95% of the slope are both negative, it is judged as "decreasing," and when the lower and upper 95% of the slope are both positive, it is judged as "increasing."
 - (iii) When increasing or decreasing tendencies are unclear (either the lower or upper limit of 95% of the slope is negative or the other is positive), a coefficient of variation of 0.5 was used as a reference. When the coefficient of variation is less than 0.5, it is judged as "unchanged," and when the coefficient of variation is 0.5 or higher, it is judged as "fluctuations."

ii. However, data may show fluctuations, depending on minor differences in sampling locations or properties of the samples, and it is considered to be too early to make judgments on changes in detected values at this point in time. Even if a certain location is categorized as an "increasing trend" based on the abovementioned policy, whether or not the trend is increasing in a particular location requires further continuous collection of data in order to make an informed judgment.


Figure 4.3-1 Categories based on the average for each location (left: picture showing means of categorization; upper right: results of categorization⁹; lower right: correlation between average and maximum value for each location)

*1: locations where the maximum value on the horizontal axis is exceeded are not shown.

⁹Method of setting categorization boundary value: The boundary value of adjacent categories is the average value of the minimum value of the upper categorization and the maximum value of the lower categorization.

(2) Concentration levels in sediment samples from rivers, lakes, and coastal areas and their changes

by prefecture

(2)-1 Rivers

1) Iwate Prefecture

In Iwate Prefecture, surveys were conducted 11 to 21 times from December 2011 to February 2017 for river sediment samples collected at 22 locations (this analysis excludes the survey results from one location where the survey was conducted only in 2011).

Regarding the concentration levels of detected values, three locations were categorized into Category D and 19 locations were categorized into Category E (see Table 4.3-1 and Table 4.3-2).

Concentration levels were generally decreasing at 19 locations and were fluctuating at three locations.

Table 4.3-1 Categorization of detected values at respective locations (lwate Prefecture: river sediments)

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	0	(None)
D	Upper 25 to 50 percentile	3	No. 4, No. 16, No. 22
Е	Lower than upper 25 to 50 percentile (lower 50%)	19	No. 1, No. 2, No. 3, No. 5, No. 6, No. 7, No. 8, No. 9, No. 10, No. 11, No. 12, No. 13, No. 14, No. 15, No. 17, No. 18, No. 19, No. 20, No. 21



Figure 4.3-2 Changes in concentration levels over the years at respective locations (Iwate Prefecture: river sediments)

			Location					Rive	er sedi	ments	/Radio	oactive	e Cesiu	ım (Cs	-134+	Cs-1	37)/Co	ncentr	ation(Bq/kg)	(*1)							
No		Water area	Location	Municipality	-		_	FY2	011									FY	2012		r		-					
		Sakari River			8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	_			
1		Lower Reaches	Sano Bridge	Ofunato City					98						176						0				_			
2		Kesen River	Aneha Bridge	Rikuzentakada City					143						18						15				_			
3		Okawa River	with Miyagi	Ichinoseki City					990						300			152			87		281					
4		Tsuyagawa River	Chiyogahara Bridge	Ichinoseki City					520						116						158							
5		Kurosawa River	Kawarada Bridge	Kanegasaki Town											97			76			54		99					
6			Oago Bridge	Oshu City																								
7		Isawa River	Saijin Bridge	Oshu City																								
8		Kitakami River	Fuji Bridge	Oshu City					210						77			40			50		80					
9		Shiratori River	Shiratori Bridge	Oshu City					215						134			111	1		90		171		-			
10	_	V Diver	Varanna anna Bridaa	Uminumi Toum					570						260			156			107		190		-			
10	<u>'</u>	Koromo River	Koroniogawa Biluge						570						500			150			107		105		-			
11		Ota River	Hitosuji Bridge	Hiraizumi Town					97						770						410				_			
12	2 Sitaka	Middle Reaches	Kamino Bridge	Ichinoseki City					370						195			141			87		93		_			
13	B Ri	Iwai River Lower Reaches	Kozenji Bridge	Ichinoseki City																								
14	4 Ver S	Kitakami River	Chitose Bridge(Kozenji)	Ichinoseki City					170						158			54			106		19					
15	ystem	Sokei River	Unada Bridge	Ichinoseki City					420						151			150			640		150	1				
16	5	Sarusawa River	Kannon Bridge	Ichinoseki City			1	1	330		1	1	1		230		1	310			1,040		530					
17	,		Oide Bridge	Ichinoseki City							1								1			-	1		1			
18	2	Satetsu River	Kanzaki Bridge	Ichinoseki City					330						137			147			189		116		-			
10	-	Senmaya River	Miyata Bridan	Ichinocal: City		-	-	+	200	-		-	-	-	200	-	1	340	-	-	202		201		-			
19	<u></u>	Upper Reaches	Miyata Bridge	Ichinoseki City					290						380			300			205		201		-			
20)	Kitakami River	Kitakamigawa Bridge	Ichinoseki City					73						51			65			85		28		_			
21	L	Kinomi River	Higuchi Bridge	Ichinoseki City					310						270			138			980		123					
22	2	Kinryu River	Tenjin Bridge	Ichinoseki City					320						214			400			169		370	1				
					Total of sa	number mples	401	Dete tir	ection nes	346																		
					*1: Blar	nk cells	are loc:	ations w	here sa	mples v	were no	ot colled	cted. Th	e result	"Not d	letectal	ole" is i	ndicated	1 as "0.	"								
			Location							Rive	r sedi	ments/	Radio	active	Cesiu	n (Cs-	-134+	Cs-13	7)/Coi	ncentra	tion(B	q/kg)((*1)					
No		Water area	Location	Municipality						Rive FY20	r sedi)13	ments/	Radio	active	Cesiu	n (Cs	-134+	Cs-13	7)/Coi	ncentra	tion(B	q/kg)(FY2	(* 1) 014					
No).	Water area	Location	Municipality	4	5	6	7	8	River FY20 9	r sedi)13 10	ments/	Radio:	active	Cesiu 2	n (Cs	- 134+ 4	Cs-13	7)/Cor 6	rcentra	tion(B	q/kg)(FY2) 9	(*1) 014 10	11	12	1	2	3
No 1).	Water area Sakari River Lower Reaches	Location Location Sano Bridge	Municipality Ofunato City	4	5 51	6	7	8	River FY20 9	r sedi)13 10	ments/ 11 63	Radio:	1	Cesiun 2	m (Cs	- 134 +	Cs-13 5 19	7)/Cor 6	rcentra 7	tion(B 8	q/kg) FY2 9	(*1) 014 10	11 0	12	1	2	3
No 1 2		Water area Sakari River Lower Reaches Kesen River	Location Location Sano Bridge Aneha Bridge	Municipality Ofunato City Rikuzentakada City	4	5 51 11	6	7	8	River FY20 9	r sedi)13 10	11 63 20	Radio:	1	Cesiun 2	m (Cs-	- 134+ 4	Cs-13 5 19 24	7)/Coi 6	7	s	q/kg)(FY2) 9	(*1) 014 10	11 0 15	12	1	2	3
No 1 2 3		Water area Sakari River Lower Reaches Kesen River Okawa River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi	Municipality Ofunato City Rikuzentakada City Ichinoseki City	4	5 51 11 340	6	7	8	River FY20 9	r sedi 013 10	11 63 20 80	12	1	2 117	n (Cs	4	Cs-13 5 19 24 120	7)/Coi	7	8 133	q/kg)(FY2) 9	(*1) 014 10	11 0 15 83	12	1	2	3
No 1 2 3 4		Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City	4	5 51 11 340 122	6	7	8	River FY20 9	r sedi	11 63 20 80 85	/Radio:	1	2 117	m (Cs	4	Cs-13 5 19 24 120 105	7)/Con 6	7 7	8 133	q/kg)(FY20 9	(*1) 014 10	11 0 15 83 100	12	1	2	3
No 1 2 3 4 5		Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge Kawarada Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town	4	5 51 11 340 122 54	6	7	8	River FY20 9	r sedii)13 10	11 63 20 80 85 53	Radio:	1	2 117	m (Cs	4	Cs-13 5 19 24 120 105 55	7)/Cor 6	7 7	8 133	q/kg)(FY2) 9	(*1) 014 10	11 0 15 83 100 35	12	1	2 55	3
No 1 2 3 4 5 6		Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River	Location Location Sano Bridge Aneha Bridge Prefectural border with Myagi Chiyogahara Bridge Kawarada Bridge Ougo Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City	4	5 51 11 340 122 54 11	6	7	8 101 0	Rive : FY20 9	r sedii	11 63 20 80 85 53 27	12	1	2 1117 0	n (Cs-	4	Cs-13 5 19 24 120 105 55 11	7)/Con	7 7	133 0	q/kg)(FY2 9	(*1) 014 10	11 0 15 83 100 35 0	12	1	2 55 0	3
Noo 1 2 3 4 5 6 7		Water area Sakari River Lower Reaches Kesen River Okawa River Kurosawa River Isawa River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge Kawarada Bridge Oago Bridge Saijin Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City	4	5 51 11 340 122 54 11 0	6	7	8 101 0 0	Rive FY20 9	r sedii 013 10	11 63 20 80 85 53 27 0	12	1	2 1117 0 0	3	4	Cs-13 5 19 24 120 105 55 11 14	7)/Con	7	tion(B 8 133 0 0	9 9	(*1) 014 10	11 0 15 83 100 35 0 0	12		2 55 0	3
No 1 2 3 4 5 6 7 8		Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Isawa River Kitakami Piver	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogaham Bridge Kawarada Bridge Qago Bridge Saijin Bridge Fuji Bridge	Municipality Ofunato Cáty Rikuzentakada Cíty Ichinoseki Cíty Ichinoseki Cíty Kanegasaki Town Oshu Cíty Oshu Cíty Oshu Cíty	4	5 51 11 340 122 54 11 0	6	7	8 101 0 0 12	Rive FY20 9	r sedii 10 10	11 63 20 80 85 53 27 0 0 0	Radio:	1	2 1117 0 0 13	3	4	Cs-13 5 19 24 120 105 55 11 14 75	6 6	7 7	tion(B 8 133 0 0 0	q/kg)(FY20 9	(*1) 014 10	11 0 15 83 100 35 0 0 0 21	12		2 555 0 0	3
Noo 1 2 3 4 5 6 7 8 8		Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Kitakami River Shiratori Dama	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge Kawanda Bridge Oago Bridge Saijin Bridge Fuji Bridge Shipuon Préfere	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Ichinoseki City Oshu City Oshu City Oshu City Oshu City Oshu City	4	5 51 11 340 122 54 11 0	6	7	8 101 0 0 12 61	Rive: FY20 9	r sedii 013 10	11 63 20 80 85 53 27 0 0 59	12		2 1117 0 0 13 56	3	4	Cs-13 5 19 24 120 105 55 11 14 75 138	6 6	7	tion(B 8 133 0 0 0 0 46	q/kg)(FY2/ 9	(*1) 014 10	11 0 15 83 100 35 0 0 21 45	12		2 555 0 0 13	3
No 1 2 3 4 5 6 7 8 9 10		Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Isawa River Kitakami River Shiratori River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogaham Bridge Kawarada Bridge Gago Bridge Saijin Bridge Fuji Bridge	Municipality Ofunato Cáty Rikuzentakada Cíty Ichinoseki Cíty Ichinoseki Cíty Ichinoseki Cíty Kanegasaki Town Oshu Cíty Oshu Cíty Oshu Cíty Oshu Cíty	4	5 51 11 340 122 54 11 0	6 18 98	7	8 101 0 0 12 61	River FY2C 9	r sedii 013 10	11 63 20 80 85 53 27 0 0 59	12		2 1117 0 0 113 66	3	4	Cs-13 5 19 24 120 105 55 11 14 75 138	6	7	tion(B 8 133 0 0 0 0 46	q/kg)(FY2 ¹ 9	(*1) 014 10	11 0 15 83 100 35 0 0 21 45 70	12		2 555 0 0 13 46	3
Noo 1 2 3 4 5 6 7 8 9 9 10		Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Isawa River Kitakami River Shiratori River Koromo River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogaham Bridge Kawarada Bridge Gago Bridge Saijin Bridge Fuji Bridge Shinatori Bridge	Municipality Ofunato Cáty Rikuzentakada Cíty Ichinoseki Cíty Ichinoseki Cíty Ichinoseki Cíty Kanegasaki Town Oshu Cíty Oshu Cíty Oshu Cíty Oshu Cíty Hiraizumi Town	4	5 51 11 340 122 54 11 0 0	6 18 98	7	8 101 0 0 12 61 79	River FY2C 9	r sedii)13 10	11 63 20 80 85 53 27 0 0 59 66 66	12 12		2 1117 0 0 13 66 57	m (Cs	4	Cs-13 5 19 24 120 105 55 11 14 75 138 83	6 6	7 7	tion(B 8 133 0 0 0 0 0 46 78	q/kg)(FY2 9	(*1) 014 10	11 0 15 83 100 35 0 0 21 45 79			2 555 0 0 13 46 70	3
Noo 1 2 3 4 5 6 7 8 9 100 111		Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Kitakami River Shiratori River Koromo River Ota River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge Kawanda Bridge Gago Bridge Gago Bridge Saijin Bridge Shintori Bridge Koromogawa Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City Oshu City Oshu City Hinaizumi Town Hiraizumi Town		5 51 11 340 122 54 11 0 117 179	6 18 98	7	8 101 0 0 12 61 79 76	River FY2C 9	r sedii 10 10	11 63 20 80 85 53 27 0 0 59 66 46	12 12		2 1117 0 0 13 66 57 107	3	4	Cs-13 5 19 24 120 105 55 11 14 75 138 83 93	6 6	7 7	tion(B 8 1 133 1 0 0 0 0 0 0 78 57	9/kg)(h)	(*1) 014 10	11 0 15 83 100 35 0 0 21 45 79 48			2 555 0 0 13 46 70 36	3
Noo 1 2 3 4 5 6 7 8 9 10 111 122	Xiinki	Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Isawa River Kitakami River Shiratori River Koromo River Ota River Iwai River Middle Reaches	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge Kawarada Bridge Gago Bridge Gago Bridge Saijin Bridge Shinatori Bridge Koromogawa Bridge Hitosuji Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City Oshu City Oshu City Hiraizumi Town Hiraizumi Town Ichinoseki City		5 51 11 340 122 54 11 0 117 1177 75	6 18 98	7	8 101 0 0 0 12 61 79 76 67	River FY20 9	r sedii 10 10	ments/ 11 63 20 80 85 53 27 0 59 66 46	12 12	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 1117 0 0 13 66 57 107 55	3	4	Cs-13 5 19 24 120 105 55 11 14 75 138 83 93 48	6 6		8 8 8 133 1133 0 0 0 0 0 0 0 78 57 226 2	9 9	(*1) 014 10	11 0 15 83 100 35 0 0 21 45 79 48 27			2 555 0 0 0 13 46 70 36 63	3
Noo 1 2 3 4 5 6 7 8 9 100 111 122 13	Diamonda Kitakami R	Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Isawa River Kitakami River Shiratori River Koromo River Ota River Iwai River Iwai River Iwai River Iwai River Iwai River Lower Reaches	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge Kawarada Bridge Gago Bridge Gago Bridge Saijin Bridge Shintori Bridge Koromogawa Bridge Hitosuji Bridge Kamino Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City Oshu City Oshu City Hinizuni Town Hinizuni Town Ichinoseki City Ichinoseki City		5 51 11 340 122 54 11 0 0 117 179 75 96	6 18 98	7	8 101 0 0 12 61 79 76 67 80	Rive: FY229 9	r sedii 10	ments/ 11 63 20 80 85 53 27 0 59 66 46 63 326	Radio:	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Cesim 2 1117 0 0 0 113 66 57 107 55 122	3	4	Cs-13 5 19 24 120 105 55 11 14 75 138 83 93 48 301	6 6	7 7	8 8 1133 1 0 0 0 0 0 0 0 0 46 778 577 226 445 57	9(kg) FY20 9	(*1) 0014 10	11 0 15 83 100 35 0 0 21 45 79 48 27 48			2 555 0 0 13 46 70 36 63 46	
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No 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Dial Control C	Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Isawa River Kitakami River Shiratori River Koromo River Ota River Iwai River Middle Reaches Iwai River Kitakami River Sokei River Sokei River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge Kawarada Bridge Gago Bridge Gago Bridge Gago Bridge Shintori Bridge Shintori Bridge Koromogawa Bridge Hitosuji Bridge Kamino Bridge Koznji Bridge Chiose Bridge(Kozenji) Unada Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City Oshu City Oshu City Oshu City Hiraizumi Town Hiraizumi Town Ichinoseki City Ichinoseki City Ichinoseki City		5 51 11 340 122 54 11 0 122 54 11 0 117 179 75 96 101	6 18 98 1166	7	8 101 0 0 0 12 61 79 76 67 80 29 32	Rive: FY2C 9	r sedii)13 10 	II 63 20 80 85 53 27 0 0 59 66 46 63 326 294 54	12		Cesium 2 1117 0 0 0 13 66 57 107 55 122 177 52	3	4	Cs-13 5 19 24 120 105 55 11 14 75 138 83 93 48 301 108 35	7)/Con		8 8 133 1 0 0 0 0 0 0 46 78 57 26 45 47 20 20	4/kg) FY2 9	(*1) 014 10	111 0 15 83 100 35 0 0 21 45 79 48 27 48 27 48 93 26			2 555 0 0 0 13 46 70 36 63 46 28 19	
No 1 2 3 4 5 6 7 8 9 10 111 122 133 144 155 166	b. Kitakami River System	Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Isawa River Kitakami River Shiratori River Koromo River Ota River Iwai River Middle Reaches Iwai River Satusami River Sokei River Sokei River Sarusawa River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahara Bridge Kawarada Bridge Gago Bridge Gago Bridge Gago Bridge Shintori Bridge Shintori Bridge Koromogawa Bridge Hitosuji Bridge Kamino Bridge Koznji Bridge Kanon Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City Oshu City Oshu City Oshu City Oshu City Hiraizuni Town Hiraizuni Town Ichinoseki City Ichinoseki City Ichinoseki City		5 51 11 340 122 54 11 0 122 54 11 0 117 75 96 101 160	6 18 98 166	7	8 101 0 0 12 61 79 76 67 80 29 32 48	Rive: FY20 9	r sedii)13 10 	III 63 20 80 85 53 27 0 0 59 66 46 63 326 294 54	12		Cesium 2 1117 0 0 0 13 66 57 107 55 122 177 52 48	3	4	Cs-13 5 19 24 120 105 55 11 14 75 138 83 93 48 301 108 35 54	6		ition(B 8 1133 1133 0 <	4/kg)(FY2 9	(*1) 014 10	111 0 15 83 1000 35 0 0 21 45 79 48 27 48 27 48 93 26 39			2 555 0 0 13 46 70 36 63 46 28 19 38	
Noo 1 2 3 4 5 6 7 8 9 100 111 122 133 144 155 166 177	b. Kitakami River System	Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Isawa River Isawa River Kitakami River Shiratori River Ota River Middle Reaches Iwai River Middle Reaches Kitakami River Sokei River Sokei River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogaham Bridge Cago Bridge Cago Bridge Saijin Bridge Gago Bridge Shintori Bridge Koromogawa Bridge Hitosuji Bridge Komino Bridge Chirose Bridget(Kozenji) Unada Bridge Canon Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City Oshu City Oshu City Oshu City Oshu City Chinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City		5 51 11 340 122 54 11 0 0 117 179 75 96 101 101 160	6 18 98 166 149	7	8 101 0 0 12 61 79 76 67 80 29 32 48 19	River FY20099	r sedi	II 63 20 80 85 53 27 0 0 59 66 46 63 326 294 54 45 25	12 12		2 2 1117 0 0 0 13 66 57 107 55 122 177 52 48 45	3	4	Cs-13 5 19 24 120 105 55 11 14 75 138 83 93 48 301 108 35 54 19	7)/Con		8 8 8 133 133 1 0 0 0 0 0 0 0 1 <td>4/kg)(FY20 9</td> <td>(*1) 014 10</td> <td>111 0 15 83 100 35 0 0 21 45 79 48 27 48 93 26 39 27</td> <td></td> <td></td> <td>2 555 0 0 13 46 70 36 63 46 28 19 38 16</td> <td></td>	4/kg)(FY20 9	(*1) 014 10	111 0 15 83 100 35 0 0 21 45 79 48 27 48 93 26 39 27			2 555 0 0 13 46 70 36 63 46 28 19 38 16	
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Noo 1 2 3 4 5 6 7 8 9 10 111 122 133 144 155 166 177 188 199 200	State State <th< td=""><td>Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Isawa River Isawa River Shiratori River Koromo River Ota River Ota River Lower Reaches Kitakami River Sokei River Sarusawa River Satetsu River Satetsu River Senmaya River Upper Reaches Kitakami River</td><td>Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahana Bridge Chiyogahana Bridge Cago Bridge Saijin Bridge Gugo Bridge Gugo Bridge Shintori Bridge Koromogawa Bridge Hitosuji Bridge Kozenji Bridge Kozenji Bridge Kozenji Bridge Kozenji Bridge Kozenji Bridge Gulde Bridge Kannon Bridge Kannon Bridge Kanzaki Bridge Kanzaki Bridge</td><td>Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City Oshu City Oshu City Oshu City Oshu City Chinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City</td><td></td><td>5 51 11 340 122 54 11 0 111 0 111 0 111 0 111 0 111 0 111 1</td><td>6 18 98 166 149</td><td>7</td><td>8 101 101 101 0 0 12 61 79 76 67 80 29 32 48 19 0 577 13 13</td><td>River FY2099</td><td>r sedio 10 10</td><td>III Galaxy 11 63 20 80 80 85 53 27 0 0 59 66 46 63 326 294 54 45 255 0 67 59</td><td></td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>2 2 117 1 0 0 117 1 0 0 113 66 57 1 107 55 122 1 177 52 48 45 100 129 12 12</td><td>m (Cs 3</td><td>4</td><td>Cs-13 5 19 24 120 105 55 11 14 75 138 83 93 48 301 108 35 54 19 0 1000 54</td><td>7)/Con</td><td></td><td>Ition(B 8 1 8 1 133 1 133 1 133 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 10 1 10 1 10 1 1112 1 1112 1</td><td>9/kg)(FY20 9</td><td>(*1) 014 10</td><td>11 0 15 83 100 35 0 21 45 79 48 27 48 93 26 39 277 0 87 20</td><td></td><td></td><td>2 555 0 0 13 46 70 36 63 46 28 19 38 16 0 76 16</td><td></td></th<>	Water area Sakari River Lower Reaches Kesen River Okawa River Tsuyagawa River Kurosawa River Isawa River Isawa River Shiratori River Koromo River Ota River Ota River Lower Reaches Kitakami River Sokei River Sarusawa River Satetsu River Satetsu River Senmaya River Upper Reaches Kitakami River	Location Location Sano Bridge Aneha Bridge Prefectural border with Miyagi Chiyogahana Bridge Chiyogahana Bridge Cago Bridge Saijin Bridge Gugo Bridge Gugo Bridge Shintori Bridge Koromogawa Bridge Hitosuji Bridge Kozenji Bridge Kozenji Bridge Kozenji Bridge Kozenji Bridge Kozenji Bridge Gulde Bridge Kannon Bridge Kannon Bridge Kanzaki Bridge Kanzaki Bridge	Municipality Ofunato City Rikuzentakada City Ichinoseki City Ichinoseki City Kanegasaki Town Oshu City Oshu City Oshu City Oshu City Oshu City Oshu City Chinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City Ichinoseki City		5 51 11 340 122 54 11 0 111 0 111 0 111 0 111 0 111 0 111 1	6 18 98 166 149	7	8 101 101 101 0 0 12 61 79 76 67 80 29 32 48 19 0 577 13 13	River FY2099	r sedio 10 10	III Galaxy 11 63 20 80 80 85 53 27 0 0 59 66 46 63 326 294 54 45 255 0 67 59		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 2 117 1 0 0 117 1 0 0 113 66 57 1 107 55 122 1 177 52 48 45 100 129 12 12	m (Cs 3	4	Cs-13 5 19 24 120 105 55 11 14 75 138 83 93 48 301 108 35 54 19 0 1000 54	7)/Con		Ition(B 8 1 8 1 133 1 133 1 133 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 10 1 10 1 10 1 1112 1 1112 1	9/kg)(FY20 9	(*1) 014 10	11 0 15 83 100 35 0 21 45 79 48 27 48 93 26 39 277 0 87 20			2 555 0 0 13 46 70 36 63 46 28 19 38 16 0 76 16	
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Table 4.3-2 Detection of radioactive cesium at respective locations (Iwate Prefecture: river sediments) (1)

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with Miyagi | Ichinoseki City | | 32 | |

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 | 38 | 3 | 1.43 | 1 |
| 'suyagawa River | Chiyogahara Bridge | Ichinoseki City | | 79 | |

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| Kurosawa River | Kawarada Bridge | Kanegasaki
Town | | 23 | |

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| Koromo River | Koromogawa Bridge | Hiraizumi Town | | 48 | |

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| Ota River | Hitosuji Bridge | Hiraizumi Town | | 49 | |

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| wai River
.ower Reaches | Kozenji Bridge | Ichinoseki City | | 37 | |

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| Gitakami River | Chitose
Bridge(Kozenji) | Ichinoseki City | | 19 | |

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| Sarusawa River | Kannon Bridge | Ichinoseki City | | 55 | |

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| Ginomi River | Higuchi Bridge | Ichinoseki City | | 12 | |

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| Ginryu River | Tenjin Bridge | Ichinoseki City | | 50 | |

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Table 4.3-2 Detection of radioactive cesium at respective locations

(Iwate Prefecture: river sediments) (2)

2) Miyagi Prefecture

In Miyagi Prefecture, surveys were conducted 20 to 53 times from October 2011 to February 2017 for river sediment samples collected at 43 locations (this analysis excludes the survey results from 37 locations where the survey was conducted only in 2011).

Regarding the concentration levels of detected values, five locations were categorized into Category C, 17 locations into Category D, and 21 locations into Category E (see Table 4.3-3 and Table 4.3-4).

Concentration levels were generally decreasing at 35 locations and were fluctuating at eight locations.

Table 4.3-3 Categorization of detected values at respective locations (Miyagi Prefecture: river sediments)

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	5	No. 24, No. 32, No. 33, No. 41, No. 43
D	Upper 25 to 50 percentile	17	No. 2, No. 5, No. 6, No. 7, No. 8, No. 14, No. 17, No. 18, No. 20, No. 21, No. 23, No. 27, No. 31, No. 34, No. 36, No. 37, No. 42
Е	Lower than upper 25 to 50 percentile (lower 50%)	21	No. 1, No. 3, No. 4, No. 9, No. 10, No. 11, No. 12, No. 13, No. 15, No. 16, No. 19, No. 22, No. 25, No. 26, No. 28, No. 29, No. 30, No. 35, No. 38, No. 39, No. 40





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-3 Changes in concentration levels over the years at respective locations (Miyagi Prefecture: river sediments)

Table 4.3-4 Detection of radioactive cesium at respective locations (Miyagi Prefecture: river sediments) (No.1)

		Location River sediments/Radioactive Cesium (Cs-134+Cs-137)/Concentration(Bq/kg)(*1)																								
No.		Water	area	Location	Municipality				FY2	011	-	-							FY2	012						
				Viewe Deider		8	9	10	11	12	1	2	3	4	5	6	7	8	9	1	0	11	12	1	2	3
1		Shishio	ri River	Kinzan bilige				1 220				211				100			124			270		363		
2				Namiita Bridge	-			1,220				810				189			105			370		202		
			D.	i ateyama-onasni Bridge	Kesennuma City			750				115				50			91			121		20		
4		Okawa	a River	Kamiyama Bridge				860			1.000	990				59			222			2/1		190		
5				Okawa River Estuary				23			1,660					0			0			0		0		
6		Omose	River	Ozaki Bridge				2,200				2,500				159			400			510		670		
7			Arima River	Unanda Bridge				1,000				800				146			570			420		440		
8			Kinryu River	Obata Bridge				770				530				1,190			380			340		570		
9			Kitakami River	Tome-ohashi Bridge (Tome)				113				98				74			118			199		71		
10	-		Sanhasama River	Doman Bridge (Kurikoma Dam)	Kurihara City			85				137				55			260			24		20		
11	-		Nihasama River	Kajiya Bridge				750				490				480			450			131			\vdash	
12		River Area		Hanayama Dam, inflow area	-			44				60				135			56			0		14		
13	Kitakami River		Hasama River	Wakayanagi				400				670				84			340			104		65		I
14	System			Yamayoshida Bridge	Tome City			1,730				1,340				370			69			530		600		
15	ļ		Eai River	Todoroki Bridge (Todoroki)	1			260				77				470			970			89			66	
16	ļ			Shimizu Komon Lock	Osaki City			141				330				63			104			18		0		
17	ļ	Eai River Area	In Furukawa District,Osaki City	Shinborisaihon, entrance				1,190				2,700				980			800			710		690		
18			Dekigawa River	Kogota Bridge	Misato Town			360				590				470			930			195		233		
19			Eai River	Oikawa Bridge (Tandai)	Wakuya Town /Ishinomaki Town			260				172				79			66			37		73		
20		Кут	1-Kitakami River	Kadonowaki	Ishinomaki City			240				175				36			49			0		10		
21		Naruse	e River	Onobashi Bridge (Ono)	Higashi-Matsushima City			0				74				28			41			65		17		
22		S	hi Dium	Tagajozeki Weir	Trania Cita			1,530				62				1,230			560			650		1,180		
23		Sunaosi	lli Kivei	Nenbutsu Bridge	ragajo City			2,900			129					340			710			960		490		
24		Teizan-un (Kyu-sunao	ga Canal shi River)	Teizan Bridge	Shiogama City/Shichigahama Town/Tagajo City			1,410				95				141			2,280			380		101		
25			N. 15 D.	Nanakita Bridge				109				157				450			350			71			43	
26	Nanakita		Nanakita River	Fukuda-ohashi Bridge				10				60				14			60			17			17	
27	System		Umeda River	Fukuda Bridge	Sendai City			1,350				300				600			53			300			820	
28			Nanakita River	Takasago Bridge				11,100				220				630			0		_	42		450		
29			Natori River	Yuriage-ohashi Bridge	Sendai City /Natori City			610			108					470			14		-					
30	Natori			Yakushi Bridge				56				47				68			220		\neg	73				
31	River System		Masuda River	Koyama Bridge	Natori City			5,200				116				124			202			221		236		
32	İ			Bishamon Bridge	1			1,140				1,390				1,590			3,700		\neg	2,020		2,270		
33				Hadeniwa Bridge	Marumori Town									1,120	690	580	380	430	530	520	330	350	350	370	330	
34	İ		Abukuma River	Marumori Bridge	Marumori Town			220				1,470		570	101	560	610	280	162	3,400	90	1,360	710	580	1,230	
35				Higashine Bridge	Kakuda City																					
36	İ		Shiroishi River	Before the confluence with Kawaragosawa	Shiroishi City			1,730				191				116			123		\neg	190				
37			Saikawa River	Etsubo Bridge	Shiroishi City			430								590			350			270				
38	Abukuma River	Shiroishi River Asree	Matsukawa River	Miya-ohashi Bridge	Zao Town			119								19			47		\neg	54		66		
39	System	River Aarea	Arakawa River	Niragami Bridge	Murata Town/Ogawara Town			33				36				68			38			32		101		
40	t		Shiroishi River	Shirahata Bridge	Shibata Town			32				61				60			32		-	31		68		
41				Tsukinoki-ohashi Bridge	Kakuda City/Shibata Town										2,470 540		88		340	e	j3			154	152	
42	ł		Abukuma River	Abukuma-ohashi Bridge (Iwanuma)	Iwanuma City/Watari Town			91			760			410	380	1,410	136	196	143	730	300	1,410	243	247	500	
43	ł			Abukuma River Estuary (Watariohashi	Iwanuma City/Watari Town										103 249	- 1	104	-	102	g	91		-	187	49	
F	I	I		Bridge)		Total n	umber	1.048	Detec	tion	976		I					I					I			
						of sa ∗1· Rt~	nples	are loc-	tin tiops	ies here so	mples -	vere not	t collect	ed Tha	result "Not dat	ectable"	'is judi-	ated or	0							
																	andk									

Table 4.3-4 Detection of radioactive cesium at respective locations (Miyagi Prefecture: river sediments) (No.2)

				Location River sedime										Radioad	ctive C	esium	(Cs-13	4+Cs	-137)/0	Concer	ıtratio	n(Bq/k	g)(*1)						-
No.		Water	area	Location	Municipality		-	-		-	FY201	3	1	_			_				-	1	FY2	2014		r—			
						4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		Shishio	ri River	Kinzan Bridge			139		_	83			99		96				103			71			93		85		<u> </u>
2				Namiita Bridge			245		_	28			186		268				300			150			231		265		-
3				Tateyama-ohashi Bridge	Kesennuma City		39			43			51		35				33			54			60		61		
4		Okaw:	a River	Kamiyama Bridge			99			65			460		580				269				460		288		76		I
5				Okawa River Estuary			0			0			0		0				0			0			0		0		
6		Omose	River	Ozaki Bridge			730			64			194		63				158			158			185		182		
7			Arima River	Unanda Bridge			420			173			229		210				225			152			145		131		
8			Kinryu River	Obata Bridge			289			165			196		221				271			250			304		184		
9			Kitakami River	Tome-ohashi Bridge (Tome)			115			22			63		133				119			106			158		139		
10			Sanhasama River	Doman Bridge (Kurikoma Dam)	Kurihara City		25			13			38		45				40			33			26		22		1
11			Nihasama River	Kajiya Bridge			153			123			161		167				124			54			98		91		1
12		Hasama River Area		Hanayama Dam, inflow area			17			0			0		0				0			0			0		10		1
13	Kitakami		Hasama River	Wakayanagi			90			71			33		52				62			55			61		72		1
14	River System			Yamayoshida Bridge	Tome City		150			327			68		197				225			258			339		337		
15				Todoroki Bridge (Todoroki)			67			85			66						80			67			49		46		1
16			Eai River	Shimizu Komon Lock	Osaki City		59			37			17		17				16			18			11		0		
17		Eai River	In Furukawa	Shinborisaihon, entrance			1,310			490			450		660				324			398			229		265		1
18		Area	District, Osaki City Dekigawa River	Kogota Bridge	Misato Town		305			510			134		133				153			232			95		101		
19			Fai River	Oikawa Bridge (Tandai)	Wakuwa Town Johinomski Town		56			41			21		79				20			19			13		18		_
20		Ku	-Kitakami River	Kadonowaki	Ichinomski City		0		-	27			18		26				221			171			184		212		
20		Name	Pivor	Onohashi Buidan (Ono)	Haachi Mateuchima Citu		10		-	10			82		44				40			153			53		54		
21			- Kirci	Tagaiozaki Waje	ngasin-maisusinina City		61			215			302		202				122			123			122		156		
22		Sunaos	hi River	Tagajozeki weir	Tagajo City		280		-	215			17		202				122			500			207		07		
25	-	Teizan-un	ga Canal	nenousu bridge	Shiogama City/Shichigahama		360		_	000			17		233				(20			500			307		67		
24		(Kyu-sunac	shi River)	Teizan Bridge	Town/Tagajo City		218		_	980			820		000				020			090			470		570		
25	N 15		Nanakita River	Nanakita Bridge	-		238		-	215			230		220				204			1/3			20		18		
26	River			Fukuda-ohashi Bridge	Sendai City		13		_	12			16		13				18			22			16		0		<u> </u>
27	System		Umeda River	Fukuda Bridge			390			186			233		47				76			71			84		124		I
28			Nanakita River	Takasago Bridge			291		_	610			430		225				114			293			185		124		
29			Natori River	Yuriage-ohashi Bridge	Sendai City /Natori City		0			52			11		47				61			26			23		18		
30	Natori River			Yakushi Bridge			35		23				17		20				28			52			27		43		-
31	System		Masuda River	Koyama Bridge	Natori City		450			1,010			81		168				208			21			112		74		
32				Bishamon Bridge			1,750			1,680			1,190		910				1,170			1,080			630		650		
33				Hadeniwa Bridge	Marumori Town	320		310 50	500	196		203		236	247	259		153	236	312	280	363	272	157		165	251	155	
34			Abukuma River	Marumori Bridge	Marumori Town	530		700 25	390	320		312		660	59	75		380	420	930	520	470	890	262		364	373	318	
35				Higashine Bridge	Kakuda City	283		301		161		96		212	138			122		91		98		46		98	108		
36			Shiroishi River	Before the confluence with Kawaragosawa River (Sunaoshi Bridge)	Shiroishi City	218			302				286		165			212				45			46		71		1
37			Saikawa River	Etsubo Bridge	Shiroishi City	234			360				206		146			225				188			137		153		
38	River	Shiroishi River Aarea	Matsukawa River	Miya-ohashi Bridge	Zao Town	31			58				39		10			39				13			15		14		
39	System		Arakawa River	Niragami Bridge	Murata Town/Ogawara Town		47			222			0		27				178			26			26		14		
40			Shiroishi River	Shirahata Bridge	Shibata Town		52			12			31		12				19			20			16		37		
41			•	Tsukinoki-ohashi Bridge	Kakuda City/Shibata Town	166	1	24		74		88		94	84			123		810		463		137		145	143		
42			Abukuma River	Abukuma-ohashi Bridge (Iwanuma)	Iwanuma City/Watari Town	750	1	231 65	181	490	1	270	1	91	338	318		240	101	1,620	82	197	200	77		123	111	37	
43				Abukuma River Estuary (Watariohashi Bridge)	Iwanuma City/Watari Town	85	1	41	1	2,450		209		45	580			237		60		70		1,440		65	98		
				някус)	1		·	1	_	-																		<u> </u>	
1																													

Table 4.3-4 Detection of radioactive cesium at respective locations (Miyagi Prefecture: river sediments) (No.3)

Locaios River sediments/Radioactive Cesium (Cs-134+Cs-137)Concentration/Reptgy(P1) Averg									Average of																							
No.		Water	r area	Location	Municipality			r		I	Y2015											F	2016					Changes	FY2016 (*2)	No.	of variation	Trends(*3)
						4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8 9	10	11	12	1 3	1	3	(-)		0.10	_
1		Shishio	ori River	Kinzan Bridge	-		61			68	_	_	62		73	_	_	_	36	_		52		41		48	_	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	44	1	0.49	1
2				Namiita Bridge	-		164			178			138		127				132			14	_	112		74		~~~~	108	2	1.02	1
3				Tateyama-ohashi Bridge	Kesennuma City		27			30			22		46				24			29		46		31		L	33	3	1.83	1
4		Okaw	a River	Kamiyama Bridge	-		34			62			38		35				44	_		43		44		45		hm	44	4	1.16	1
5				Okawa River Estuary			0			0			0		0				0			0		255		252		<u> </u>	127	5	3.58	1
6		Omose	2 River	Ozaki Bridge			242			273			266		111				178			127		44		179		han	132	6	1.48	1
7			Arima River	Unanda Bridge			156			146			149		45				103			139		134		125		V~	125	7	0.88	1
8			Kinryu River	Obata Bridge			188			119			125		103				129			87		114		103		han	108	8	0.88	/
9			Kitakami River	Tome-ohashi Bridge (Tome)			60			27			31		33				52			31		28		30		www	35	9	0.61	\sim
10			Sanhasama River	Doman Bridge (Kurikoma Dam)	Kurihara City		20			27			19		22				16			16		19		13		1_	16	10	1.26	1
11			Nihasama River	Kajiya Bridge			71			44			38		26				29			61		18		43		~~~~	38	11	1.15	1
12		Hasama River Area		Hanayama Dam, inflow area	1			0		0			15		0				0			0		0		0		A	0.0	12	2.03	1
13	Kitakami		Hasama River	Wakayanagi	1		59			36			36		26				30			24		33		34		1.	30	13	1.42	1
14	River System			Yamayoshida Bridge	Tome City		165			89			191		288				179		:	217		38		34		han	117	14	1.18	1
15				Todoroki Bridge (Todoroki)			37			21			26		0				15			18		12		27		1	18	15	1.82	/
16			Eai River	Shimizu Komon Lock	Osaki City		13			0			0		12				0			0		0		0		À.	0	16	1.92	/
17		Eai River	In Furukawa District Orabi Circ	Shinborisaihon, entrance	1		88			271			138		191				157			185		164		113		A	155	17	1.04	/
18		ласа	Dekigawa River	Kogota Bridge	Misato Town	-	153			157			336		78				149			194		95		159		Ann	149	18	0.79	/
19			Eai River	Oikawa Bridre (Tandai)	Wakuva Town /Ishinomaki Town		33			17			16		13				19			0		13		18			13	19	1.23	/
20		Kv	u-Kitakami River	Kadonowaki	Ishinomaki City			21		50			70		92				112			90		106		89		Ma	99	20	0.85	٨٨٨
21		Narus	e River	Onobashi Bridge (Ono)	Heachi-Matsuchima City		122			17			13		74				78			54		49		38		. Ma	55	21	0.71	
22				Tanaionaki Wair				82		110			100		42	_			27	-		40	-	30		46	+	100,000,00	38	22	1.38	<u></u>
22		Sunaos	ihi River	Nankastan Daidan	Tagajo City			145		264		-	71		267	_			161	_		40		69		40 61		1-2-	120	22	1.40	/
23		Teizan-ur	nga Canal	Neliousu in rige	Shiogama City/Shichigahama			143		204	_	-	204	_	207	_			201	_		-40	-	420		31	+	h	129	25	0.01	<u>^</u>
24		(Kyu-sunac	oshi River)	I eizan Bridge	Town/Tagajo City			403		319	_	_	384		285	_			291			12	-	428		241		VV~~_	303	24	0.91	/vv•
25			Nanakita River	Nanakita Bridge	-			20		0.5		_	15		14				0			15		0		25	_	102	9.0	25	1.04	1
26	River			Fukuda-ohashi Bridge	Sendai City			0		0		_	0		0	_	_		0	_		0		0		0		/v	0	26	1.30	1
27	System		Umeda River	Fukuda Bridge	-			69		113			64		76				65			96		46		44		W	63	27	1.34	1
28			Nanakita River	Takasago Bridge				21		30			0		0				16			0		64		0		h	20	28	3.46	/
29			Natori River	Yuriage-ohashi Bridge	Sendai City /Natori City			17		14			11		0				84			37		16		10		N	37	29	1.98	1
30	Natori River			Yakushi Bridge				26		35			29		21				25			22		18		19		Am	21	30	1.02	1
31	System		Masuda River	Koyama Bridge	Natori City			123		0			215		125				110			18		83		135		Law	112	31	2.62	1
32				Bishamon Bridge				710		608			381		300				341		3	286		297		360		A	321	32	0.75	1
33				Hadeniwa Bridge	Marumori Town	176	144	199	137	238	660	113		294	177	143		177	219	140	152	184 163	2 103		147	134 20	0	Konton	162	33	0.63	1
34			Abukuma River	Marumori Bridge	Marumori Town	800	130	384	27	84	42	69		87	113	73		130	65	109	35	91 41	39		52	75 5	3	Amana .	69	34	1.31	NM.
35				Higashine Bridge	Kakuda City	83		146		60		55		87	58			47		108		23	40		40	37		have	49	35	0.69	1
36			Shiroishi River	Before the confluence with Kawaragosawa	Shiroishi City	61			97				67		198			48			71			67		43			57	36	1.73	1
37			Saikawa River	Etsubo Bridge	Shiroishi City	136			80				89		102			92			116			51		45		2	76	37	0.70	/
38	Abukuma River	Shiroishi Diser Associ	Matsukawa River	Miya-ohashi Bridge	Zao Town	28			19				15		11			15			10			0		0		m.	6.3	38	0.94	/
39	System	River Auto	a Arakawa River	Niragami Bridge	Murata Town/Ogawara Town		16			12			15		17				18			0		14		16			12	39	1.28	٨٨٨
40			Shiroishi River	Shirahata Bridee	Shibata Town		48			31			0		14				13			0		0		14		M	6.8	40	0.74	/
41			1	Tsukinoki-ohashi Bridee	Kakuda City/Shibata Town		214	105		149		261		273	76			252		128		220	248		157	184		1	198	41	1.61	/
42			Abukuma River	Abukuma-ohashi Bridre (Iwanuma)	Iwanuma City/Watari Town	-	0 1,860	85	151	53	10	54		17	64	134		730	85	75	52	73 41	19	-	36	64 7	-	.0.11	125	42	1.33	<u>۸۸۸</u>
43				Abukuma River Estuary (Watariohashi	Iwanuma City/Watari Town		75	71		60		103		980	424			23		68		50	1.070		441	373		1 Li	354	43	1.59	
~~				Bridge)	Call Call View 1041	*1 · D*-	nk calle are be-	ations -	there cr	molar	are not	ollacted	d The	, uu	Your dur-	table"	ir indi-	and at	m	~			1,070		B	C 1			81	Averac		/ / / *
						1. 158	na cens me loc	mions v	nere sa	pies w	ae not i	. saecree	. 11001	i come "P	wa uele	aue	e muici	area as	w.					~	Б	- I			04	Average		
						*2: Ari	nmetic Averaş	je; calcu	nated by	assumi	ng ND=(r; Color	codes :	snow ci	ategorie	(see th	e right)	р. 									-0					
L						- 5: Ke	suas of the ana	rysis of	u enas a	i respec	uve loca	uons us	ang the	method	expuin	su on 4.	.3(1) 2)		⇒ D	ecreasi	ng 🦯	 Increa 	sing '		inchange	50 N	-racti	uana.ell)				

3) Fukushima Prefecture

(i) Hamadori

In Hamadori, Fukushima Prefecture, surveys were conducted 29 to 55 times from September 2011 to February 2017 for river sediment samples collected at 53 locations.

Regarding the concentration levels of detected values, 11 locations were categorized into Category A, seven locations into Category B, 14 locations into Category C, 11 locations into Category D, and 10 locations into Category E (see Table 4.3-5 and Table 4.3-6).

Concentration levels were generally decreasing at 49 locations, were unchanged at one location, and were fluctuating at three locations.

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	11	No. 3, No. 12, No. 13, No. 14, No. 20, No. 21, No. 24, No. 25, No. 26, No. 27, No. 31
В	Upper 5 to 10 percentile	7	No. 9, No. 10, No. 11, No. 17, No. 23, No. 29, No. 30
С	Upper 10 to 25 percentile	14	No. 2, No. 4, No. 6, No. 7, No. 8, No. 15, No. 18, No. 28, No. 32, No. 36, No. 39, No. 44, No. 48, No. 53
D	Upper 25 to 50 percentile	11	No. 5, No. 22, No. 33, No. 34, No. 35, No. 37, No. 38, No. 41, No. 45, No. 50, No. 52
Е	Lower than upper 25 to 50 percentile (lower 50%)	10	No. 1, No. 16, No. 19, No. 40, No. 42, No. 43, No. 46, No. 47, No. 49, No. 51

Table 4.3-5 Categorizations of detected values at respective locations (Hamadori, Fukushima Prefecture: river sediments)





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-4 Changes in concentration levels over the years at respective locations

(Hamadori, Fukushima Prefecture: river sediments)

Table 4.3-6 Detection of radioactive cesium at respective locations

(Hamadori, Fukushima Prefecture: river sediments) (No.1)

		Location							River	sedime	ents/Ra	dioactiv	ve Cesi	um (Cs	-134+0	Cs-137)/C	oncer	ıtratio	n(Bq/k	g)(*1)					
No.	Water area	Location	Municipality	0		10	FY2	011	. 1	-	2		~				0	FY2	012			2		-	
	Line and Direct	Hanahata Daidaa	Chinahi Tanan	8	9	10	11	12	1 700	2	3	4	5	6	5		8	9	10	220	1	2	0	2	3
1	Jizogawa Kiver	riamanata brioge	Shinem Town		2,000		4,400		1,790		10		980			+ >	40			320	(,	0		
2	Koizumi River	Koizumi Bridge			5,300		1,060		580		740		231		46	0 1	42			470	68	30	480		
3		Hyakken Bridge	Soma City		2,900		1,880		1,280		1,700		1,570		24	0 9	20			1,350	1,0	070	1,330		
4	Udagawa River	Horisaka Bridge			1,300		2,300		820		1,660		970		80	0 7	10			760	53	30	560		
5		Hyakken Bridge			240		490		155	155			109		55	5 1	43			84	2	3	290	0	
6	Managanya Biyar	Ochiai Bridge	Minomisomo City		4,000		660		710		180		390		31	0 4	60			450	43	30	440		
7	Mailogawa Kivei	Majima Bridge	winamisoma City		28,000		3,400		5,800		3,400			1,820	15,9	00 2	80			500	75	50	4,400		
8		Kusano			3,200		1,290		1,800		3,700			1,090	4,8	00 7	70			1,580	2,6	570		5,700	
9		Komiya	Iitate Village		4,900		4,400		2,800		4,700			3,300	7,9	00 5,	400			4,300	2,9	00		4,800	
10	Niida River	Kidouchi Bridge			11,200		2,600		1,570		4,200			3,800	2,250	2,600 2.	800			2,520	2,8	300	1,850		
11		Sakekawa Bridge			13,000		610		1.140		1.230			1.530	3.300	3.400 6.	300			5,300	3.7	00	1.070		
12		Ishiwatado Bridae			9 700		14.400		17.600		19.100			14 700	61.000	14 100 1	900			8 700	0.3	:00	15.600		
12		Kaminanahi Dailan			22,000		22,000		16,000		17,200			11,700	8 000	0 200 0	700			5,700	10	400	7 700		<u> </u>
15	Ota Binna	Kaminouchi Bridge			55,000		22,000		2 000		0.700			10,200	3,000	a,000 a,	/00			3,200	10,4	400	1,270		
14	Ota River	Masuda Bridge	Minamisoma City		00,000		2,900		2,900		9,700			18,300	3,800	22,800 25	,000			12,500	23,4	400	1,270		
15		JR Tetsudo Bridge			2,600		3,000		1,510		2,400			1,280	1,750	1,210 1,	460			1,750	1,4	70	510		
16		Maruyama Bridge			230		71		48		72			121	180	123	92			48	5	3	45		
17		Shimokawara Bridge												1,940	1,9	50 1,	430			1,080	1,0	020	1,140		
18	Odaka River	Zencho Bridge			310		720		470		1,250			700	1,0	90 3,	600			360	62	20	690		
19		Hatsukara Bridge			173		1,500		260		44			108	410	54	78			18	4	2	17		
20	Ukada Biyar	Murohara Bridge	Namia Town		43,000		87,000		52,000		92,000			165,000	13,400	17,800 12	2,800	15,600	14,600	13,400	11,600	14,200	11,000	9,500	
21	OKEGO KIVEI	Ukedo Bridge	Ivallie Town		3,300		37,000		5,000		41,000			12,400	5,600	3,700 5,	200	1,370		5,600	23,700	8,400	1,870	5,200	
22	Furumichi River	Before the confluence with Takasegawa River(Kodoshimohira Miyakoji Town)	Tamura City											950	162	1,410		80		165	17	76	640		
23	Takase River	Keio Bridge	Namie Town		24,000		1,650		1,460		2,400			5,000	15,800	15,400			17,400	1,370	1,8	30		8,100	
24		National Route 6, west	Futaba Town		12,800		18,300		7,400		17,600			5,300	5,8	00			4,800	3,700	3,6	600	4,200		
25	Maeda River	Nakahama Bridge	Namie Town		3.900		2.900		2.700		7.000			6,700	2.900	1.310 2	3,900	13,100		6.800	2.2	60	2.310		
26		National Route 6. west			5.300		7.100		5.200		6.600			3.200	3.8	00			1.610	1.070	1.2	200	1.380		
27	Kumagawa River	Mikuma Bridge	Okuma Town		9,600		10.800		4 500		10.200			41.000	26 (00			2 900	3 500	2.4	60	3 700		
27		Nabalaya Bridaa			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		10,000		1,500						20,0	.00	30		2,000	270	47	70	5,700	570	242
20			Kawauchi Village													-	00		510	270	710	500		400	242
29	Tomioka River	Sakaigawa Bridge														4	.90			440	/10	500		400	
30		National Route 6, west	Tomioka Town		930		2,800		3,200		2,400			3,600	2,1	50	-	2,530		1,300	2,3	30		1,540	
31		Kobama Bridge			40,000		17,600		9,500		9,400			1,940	2,4	/0		2,530		3,600	10,	/00		4,300	
32	Idegawa River	Motogama Bridge Before the confluence with Kidogawa	Naraha Town		530		3,500		2,400		990			780	32	0 4	-60			310	34	40		410	
33	Kawauchi River	River(Futamata Bridge)	Kawauchi Village													1	81	290	83	194	14	42		149	
34		Nishiyama Bridge	Ŭ		111		690		139		99			198	8	l		86		137	13	30		271	
35	Kidogawa River	Nagatoro Bridge	Naraha Town		400		530		970		670			320	12	1 1	78			236	28	30		217	
36		Kidokawa Bridge	Ivarana Town		200		2,500		780		680			1,060	78	0 1,	270			320	15	54		192	
37	Asami River	Boda Bridge	Hirono Town		710		830		1,260	1,370			450		24	0 2	30			153	20	00		183	
38	Ohisa River	Kageiso Bridge			3,100		1,820		2,100	450			1,620		71	0		430		560			1,570	1,270	
39	Kohisa River	Rengo Bridge	Involvi City		380		184		350	240			290		20	2		149		127			400	460	
40		Kasumida Bridge	Twaki City		460		148		250	123			156		51	2		68		75	9	2		85	
41	inida River	Matsuba Bridge			580		610		1,200	910			460		16	1		181		151	12	22		250	
42		Kitanouchi Bridge	Ono Town		66		76		206	61			29		15	5 2	80			172			0	400	
43	Natsui River	Kyudayu Bridge			80		440		117	400			0		15	9		116		149			22	14	
44		Rokujumai Bridge			43		58		210	96			66		35	0	$\neg \uparrow$	47		72			63	72	
45		Iwaanatsuri Bridge			620		380		450	430			450		29	0		370		206			330	276	
46	Yoshima River	Before the confluence with Natsui River			182		440		480	237			69		6	3	-	246		191	3	4	48		
47		Shima Bridge			64		157		630	610			102		12	6	+	55	13	-/-	,		46		
40	Fujiwara River	Minato-ohashi Bridaa	Iwaki City		520		220		520	450			1.000		21	4	_	1 /120	580	010			630	2 220	
40		Idosawa Bridaa	an ani City		0.00		2.59		161	4.00			2,000		12	4	-	1,400	580	210			0.0	2,220	
49	Samegawa River	Somorous Bridge			70		440		01	157			124		- 13	-	\dashv	0		104			16	22	
50	(1) 1 (D)	Samegawa Bridge			78		440		71	137			130		1.0	2	-	0	70	100		0	10	33	
51	Snitoki River	Nomuro Bridge			/4		121		122	500			149		10	5	-	205	/8	208	4	0		90	
52	Binda River	Kobana Bridge			257		300		510	226			2/0		19	8	\dashv	259		420	13	5/		550	
53		Binda Bridge		Tot-1	570		1,350	ation	66	260			1,980		42	U		960		540	1,5	40		156	
				of sa	mples	1,863	tim	es	1,832																

*1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0."

Table 4.3-6 Detection of radioactive cesium at respective locations

(Hamadori, Fukushima Prefecture: river sediments) (No.2)

		Location								River	sedime	nts/Ra	dioactiv	ve Cesi	um (Cs	-134+	Cs-137)	/Conce	ntratio	n(Bq/k	g)(*1)					
No.	Water area	Location	Municipality					0	FY2	013		10									FY2	014		10	<u> </u>	
1	Linnanua Binar	Hamshata Bridaa	Shinahi Tama	4	5	0	/	8	9	10	11	12	1	2	3	4	5	0 261	/	8	9	10	11	12	1	2 3
1	Jizogawa Kiver	Hamanata Bridge	Shinchi I own		620	95		151		0		1,100		24			15	501		224		170		980	\vdash	243
2	Koizumi River	Koizumi Bridge	1		235	540		1,400		1,460		261		273			333	114		181		158		247		214
3		Hyakken Bridge	Soma City		1,490	1,200		1,040		510		750		840			970	500		560		209		206		194
4	Ildagawa Diyar	Horisaka Bridge			550	370		165		650		390		820			308	390		590		382		344		470
5	ouagawa Kivei	Hyakken Bridge			100	70		84		60		64		65			83	46		149		24		28		60
6		Ochiai Bridge			224	380		250		236		490		225			560	360		500		183		309		300
7	Manogawa River	Majima Bridge	Minamisoma City		6,400	161		6,800		3,500		5,100		6,200			2,140	740		3,650		4,400		1,940		3,240
8		Kusano			630	1.870		1.010		960		510		400			530	420		1.260		1.130		1.230		980
0		Vomine	Iitate Village		3 400	1 270		2 200		2 280		1.910		2.050			1 270	1.620		2 070		2 680		2.050	+	000
10	Niida River	Komiya Kilomit Delle			2,500	2,500		2,040		760		1,010		2,000			1,270	1,020		4 900		2,240		2,050	\vdash	2.250
10			+		3,300	2,500		5,040		700		1,500		5,000			1,520	1,270		4,800		2,240		3,300	\vdash	5,550
11		Sakekawa Bridge	ł		4,900	4,700		9,500		4,100		8,400		1,420			5,200	10,100		13,100		5,300		1,080		4,480
12		Ishiwatado Bridge	1		9,500	13,400		10,300		11,300		8,300		15,500			9,300	7,700		4,300		4,600		4,600		5,500
13		Kaminouchi Bridge	1		10,900	8,400		14,300		7,400		5,500		12,300			8,400	7,400		5,900		3,150		2,860		5,500
14	Ota River	Masuda Bridge	Minamisoma City		2,090	2,520		4,500		2,400		19,800		21,900			16,500	15,000		8,700		7,800		7,300		2,590
15		JR Tetsudo Bridge	Willamisonia City		630	1,460		2,790		1,110		1,110		327			480	368		620		381		630		570
16		Maruyama Bridge	1		53	60		84		50		16		36			27	68		46		53		21		16
17		Shimokawara Bridge	1		1,270	890		1,310		3,800		940		860			900	1,020		760		830		790		970
18	Odaka River	Zencho Bridge	t		307	460		430		359		325		840			970	510		329		358		220		365
10		Hatsukara Bridge	+		48	10		0		71		52		20			65	443		280		133		21	┝─┤	0
17		Musehan Bridee			15 100	1.7	12 000	11.000	8 200	14 500	17/000	17,000	15 700	19,000			14,000	20.200	16,000	207	6.000	11 200	20.900	12/00	24.700	16 500
20	Ukedo River	Murohara Bridge	Namie Town		15,100	14,800	15,900	11,900	8,300	14,500	17,000	17,000	15,700	18,000			14,900	20,300	16,000	8,800	6,000	11,300	20,800	13,000	24,700	16,500
21		Ukedo Bridge Bafora the confluence with Takasacawa			10,700	33,000	14,700	14,000	37,000	45,000	4,700	12,100	18,000	1,510			9,400	7,300	4,900	7,900	3,190	3,690	3,020	8,800	8,600	2,810
22	Furumichi River	River(Kodoshimohira,Mivakoji Town)	Tamura City		231	220		182		171		316					111	175		95		54		80		103
23	Takase River	Keio Bridge	Namie Town		770	860		1,140		1,370		510		520			1,370	1,100		800		660		1,110		1,140
24	Maada Diyar	National Route 6, west	Futaba Town		2,500	2,510		4,500		3,600		4,100		5,200			3,690	3,350		3,860		2,510		3,210		2,560
25	wacua Kivei	Nakahama Bridge	Namie Town		9,900	2,040		6,000		2,740		2,380		2,060			1,360	3,770		1,560		1,830		1,110		690
26		National Route 6, west			1,070	2,640		1,740		2,280		830		1,780			3,010	1,880		1,970		2,360		3,120		1,230
27	Kumagawa River	Mikuma Bridge	Okuma Town		2,850	5,300		3,700		5,300		1,870		4,000			7,400	4,400		2,400		2,340		2,690		1,960
28		Nabekura Bridge			350	235		239		276		144		205			230	339		172		100		196		156
20		Calcianus Deidas	Kawauchi Village		550	600		400		240		580		420			600	500		570		420		610		266
29	Tomioka River	Sakaigawa Bringe			550	090		400		540		380		450			000	300		370		450		010	\vdash	300
30		National Route 6, west	Tomioka Town		1,780	2,580		2,170		1,150		1,540		1,400			2,450	970		990		1,020		1,430		980
31		Kobama Bridge			1,970	2,460		2,730		1,720		2,390		1,390			2,020	3,870		1,220		3,660		1,180		3,520
32	Idegawa River	Motogama Bridge	Naraha Town		310	370		640		590		470		560			460	168		228		244		297		197
33	Kawauchi River	Before the confluence with Kidogawa River(Futamata Bridge)	Kawauchi Village		177	224		154		217		170		148			182	137		208		126		171		235
34		Nishiyama Bridge	num une ni vininge		16	38		108		111		67		49			113	78		82		100		64		62
35	Kidogawa River	Nagatoro Bridge			259	390		110		58		117		94			570	410		460		249		252		267
36		Kidokawa Bridge	Naraha Town		1,100	218		226		174		210		230			810	74		740		150		167		83
37	Asami River	Boda Bridge	Hirono Town			93	380	128		187		138		169			77	124		87		95		93		93
38	Ohisa River	Kageiso Bridge				610	260	235		370		360		273			321	229		286		159		92		182
30	Kohisa Rivar	Rengo Bridge	ł			380	204	243		262		101		96			112	98		113		130		144		191
37	annisa kivei	Kenned Brider	Iwaki City			14	204	41		100		17		47				20	-	12		100		71	┝─┦	./1
40	Niida River	Kasumida Bridge	ł			14	57	41		100		1/		4/			U	0		12		29		/1	\vdash	30
41		Matsuba Bridge				195	228	211		430		80		224			61	54		71		58		41	\vdash	66
42		Kitanouchi Bridge	Ono Town			31	219	12		42		21		0			10	0		15		29		0		0
43	Natsui River	Kyudayu Bridge	1			42	13	0		14		36		10			12	11		23		12		42	\square	20
44		Rokujumai Bridge				99	94	65		91		59		45			21	26		17		56		182		109
45		Iwaanatsuri Bridge	1			79	164	47		175		80		85			254	53		63		59		34		49
46	Yoshima River	Before the confluence with Natsui River	1			157	63	163		37		17		38			0	50		15		20		16		18
47		Shima Bridge	1		38		96	144		1,280		100		78			37	22		97		102		187		92
48	Fujiwara River	Minato-ohashi Bridge	Iwaki Citv			790	139	770		369		730		1.200			41	159		54		83		20		53
-70		Idocawa Bridaa			69		270	.70 		1/19		19		.,200			10			26		19		70	\vdash	36
49	Samegawa River	nuosawa Di lugo	ł		00		2/0	+1		1+0		+0		+J			19			40		10		70	\vdash	.10
50		Samegawa Bridge	4		64		109	46		59		58		65			48	71		48		68		55	\vdash	91
51	Shitoki River	Komuro Bridge	4		40		59	52		41		48		41			14	11		12		25		21	\vdash	20
52	Binda River	Kobana Bridge	1		134		113	450		132		83		161			98	81		77		99		100	\square	60
53		Binda Bridge			1,180		620	1,210		2,020		349		117			201	246		162		174		63		64
				*1: Bla	nk cells	are loca	tions w	here sa	mples w	ere not	collecte	d. The	result "	Not det	ec table"	is indic	ated as	"0."								

Table 4.3-6 Detection of radioactive cesium at respective locations

		I meeting	•	1								D:		ate (Deal	E t.	- Card		. 1244	C- 12	7)/С-т	tentin	n/Pall	a)(01)		<i>,</i> ,								
-		Location								FY20	15	River se	aime	its/Rat	loacu	ve Cesi	um (C	8+134 T	-Cs-13	/)/Conc	entratio	п(вфк	g)(*1) FY2(016					1	Average of FY2016	No.	Coefficient of	Trends(*3)
No.	Water area	Location	Municipality	4	5	6	7	8	9		10	1	1	12	1	2	3	4	5	6	7	8	9	10	11 1	2 1	2	3	Changes	(*2)		variation	
1	Jizogawa River	Hamahata Bridge	Shinchi Town		75	70		181			26			20		0			0	15		0		11		1	0		mu	4.3	1	1.99	1
2		Koizumi Bridge			184	509		620			212			221		202			235	355		544		184	2	2	230		L	295	2	1.59	ļ
3	Kotzumi River	Hyakken Bridge			237	301		189			77		1	,840		684			1,430	1,670		170		46	1,	10	1,370)	ma M	1,016	3	0.71	/
4		Horizaka Bridan	Soma City		364	374		480			357			385		185			178	197		187		175	1	1	209		A	190	4	0.80	/
*	Udagawa River	no saka ne kige			304	374		400			357		-	365	_	185			178	197		107		115			209		1	190	4	0.80	1
5		Hyakken Bridge			77	116		64			47	_	_	72	_	141			72	59		47		42	3	6	48		man	54	5	0.93	/
6	Manogawa River	Ochiai Bridge	Minamisoma City		123	251		268		227	223 1	55 19	97 :	143	113	138			181	145			170	179	1	7	163		·	166	6	1.58	/
7		Majima Bridge			2,560	2,010		1,840		86	63 (67 10	03	169	67	84			140	85		352		422	1	6	250		J.m.	239	7	1.68	1
8		Kusano			580	600		1,170		940 1	,010 7	20	;	810		467			428	630		375		288	4	4	415		M	425	8	0.97	ļ
9		Komiya	litate Village		2.010	1 760		2 610		430	266 3	68		362		750			417	215	1	1 1 9 0		730	4	2	1.080	,	Mr. a.	679	9	0.76	/
,	Niida River	101 1 1 1 1 1			1,000	1,700		£90		440	200 3	007		102	-	1.100			790	000		.,	108	710	-	-	406		· · • • • • • • • • • • • • • • • • • •	(24	10	0.01	1
10		Rubuciii în luge			1,900	1,330		560		440	299 2	.91	-	565	-	1,100			780	900			465	/10	3	-	470	-	man_	024	10	0.91	
11		Sakekawa Bridge			296	820		1,610		790	800 6	40	-	/90	_	1,320			740	860		740		585	1	5	103		Lvwh	537	11	1.07	/VV¥
12		Ishiwatado Bridge			7,900	4,280		4,230		1,080	890 1,	360	1	,450		1,450			1,540	1,530			1,300	2,440	1,:	50	1,480)	d-	1,590	12	1.15	1
13		Kaminouchi Bridge			4,200	4,170		3,220		1,280 2	,590 1,	850	1	,830		1,830			1,210	1,540	1	1,780	1	2,090	1,:	70	1,030)	m	1,487	13	0.92	/
14	Ota River	Masuda Bridge	1		760	1,190		20,100		1,630 2	,950 6	i20	2	,560		980			2,240	2,480	-	5,200	1	2,320	2,4	50	2,190)	A CAL	2,813	14	1.26	/
15		JR Tetsudo Bridge	Minamisoma City		307	455		167		254	170 2	18	1	314		312			423	244			185	229	3	8	169		March	266	15	0.90	1
					20	22				76	107	0	-	20	-	12			22	21		20		48			26		1.	22	14	0.70	/
10		Maruyana Bruge			2.9	2.5		0		15	107 0		-	39	_	12			35	51		20		40			2.5	-	m	35	10	0.73	1
17		Shimokawara Bridge			580	990			503	540	436 5	11	-	740		750			444	605		382		473	5	8	493		Jun-	488	17	0.67	1
18	Odaka River	Zencho Bridge			135	185			286	167	166 1	58		138		169			166	236		124		187	1	i3	136		A	169	18	1.23	1
19		Hatsukara Bridge			31	307		0		23	36 3	31		13		33			20	23		44		46			28		here	27	19	2.13	/
20		Murohara Bridge			9,900	11,000	7,300	15,000	5,400	6	,300	3,9	010 7	,100 4	,220	4,530			4,420	3,670	6,700	3,600	5,870	3,640	5,590 3,3	80 4,99	0 3,220)	А	5,008	20	1.45	ļ
21	Ukedo River	Ukedo Bridze	Namie Town		3.030	2.660	1.520	730	1.570	2	.230	2.2	210 4	160 2	.660	2.530			1.790	1.990	2.730	3.760	810	631	830 1.0	60 2.64	0 1.040	,	N. IA	1,728	21	1.31	/
22	Europeiski Disar	Before the confluence with Takasegawa	Territor City		217	160		100	- ,		122	-,-		22	,	60			142	101	-,	154		120	1	0	82		1	120	22	1.24	1
22	Furumieni River	River(Kodoshimohira, Mivakoii Town)	I amura City		517	109		199			123		_	32		69			142	101		154		150		0	82		m	120	22	1.24	1
23	Takase River	Keio Bridge	Namie Town		7,000	1,100		790		1	,260			\$50		800			600	800		740		590	2	1	242		m	542	23	1.67	1
24	Manda Pinar	National Route 6, west	Futaba Town		2,880	3,380		2,890		3	,900		2	,320		1,460			2,860	1,890	2	2,240	1	1,640	2,	90	2,630)	N	2,242	24	0.87	1
25	Shiften Kiver	Nakahama Bridge	Namie Town		2,430	5,000		3,540		2	,550		1	,750		3,140			1,450	1,650	1	1,530	1	1,150	4,1	30	132		Anna	1,790	25	1.11	/
26		National Route 6, west			780	580		1,000			740		4	960		910			3,540	960	1	1,040		685	4	2	1,390)	Marca 1	1,343	26	0.80	/
27	Kumagawa River	Mikuma Bridge	Okuma Town		4,480	3.200			2.230	1	.150		1	470		2.600			2.370	1.780		1.420		1.270	8	0	1.370	,	Δ.	1.515	27	1.45	/
20		Nahadama Daidan			108	217		194	,		102			117	-	107			222	169		127		172	1		102		And	150	29	0.40	1
20		Nabekula Brage	Kawauchi Village		190	217		104			102		-		_	107			232	108		137		175		10	105		Aleren Poli	139	20	0.49	1
29	Tomioka River	Sakaigawa Bridge			499	462		393			700		- 1	518		690			504	830		657		303	3.	1	341		- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	498	29	0.26	~~~
30		National Route 6, west	Tomioka Town		870	600			660	2	,200		4	\$71		3,370			1,130	366		231		142	2	5	1,040)	man	534	30	0.61	NV.
31		Kobama Bridge			1,880	760			1,190		830		1	,330		1,350			1,900	2,480	1	1,860	1	1,280	2,5	70	1,730)	L	1,970	31	1.64	/
32	Idegawa River	Motogama Bridge	Naraha Town		169	188		94			218			222		204			191	129		232		238	2	6	233		<u> </u>	217	32	1.33	ļ
33	Kawauchi River	Before the confluence with Kidogawa			162	212		231			39			68		59			77	116		144		95	4	7	71		pring a	92	33	0.42	~~^
24		River(Futamata Bridge)	Kawauchi Village		25	42		60			50		-	24		57			27	00		51		195			28		1	70	24	1.14	/
34		Nisinyana bi kige		-	25	42		00			50			24	_	57			27	30		51		185	-	,	20		M	70	34	1.14	1
35	Kadogawa River	Nagatoro Bridge	Naraha Town		96	84		57			109	_	-	150	_	155			59	117			40	61	5	6	112		m	79	35	0.85	1
36		Kidokawa Bridge			68	190		132			327		-	317		259			154	91			172	172	1	6	225		hun_	167	36	1.16	1
37	Asami River	Boda Bridge	Hirono Town		191	279		139			119			134		109			50	229		75		101	2	3	42		Luni	87	37	1.24	1
38	Ohisa River	Kageiso Bridge			194	257		84			93			62		58			236	142		50		75	4	8	45		<u>س</u> ــــ	99	38	1.32	ļ
39	Kohisa River	Rengo Bridge	1		92	210		112		l	126			183		158			251	191		137		215	1	7	115	1	when	178	39	0.47	/
40		- Kasumida Bridee	Iwaki City	F	16	20		26			28		+	24	+	19			19	23		18	+	20		3	24	1		21	40	1 34	/
+0	Niida River					20		20			20		+		-	~							-	20		~			Λ		40	1.04	1
41		Matsuba Bridge			61	117		12			56	_	_	82	_	46			52	51		/4		82	P	13	82		~~	/4	41	1.24	1
42		Kitanouchi Bridge	Ono Town		21	12		0			22			17		17			13	13		15		23	1	1	10		1.M	12	42	1.60	1
43	Natsui River	Kyudayu Bridge			15	14		17			21			14		20			16	32		29		21		1	35		h~	22	43	1.74	1
44		Rokujumai Bridge			108	154		63			152			223		235			166	231		182		122	3	3	255		And	213	44	0.71	NV.
45		Iwaanatsuri Bridge			84	66		28			69			75		78			58	77		61		82	4	2	79		much	67	45	0.93	/
46	Yoshima River	Before the confluence with Naturi Piver		-	27	26		21			25			26		113			28	22		44		38		1	27		1	32	46	1.30	/
+0					27	20		~				-		20	-	105			20	20		44	-	30	-		27		VM	32	40	1.00	
47	Fujiwara River	Shima Bridge			22	4/		24			46	_	-	148	_	106			30	30		18		24	2	2	55		^_L	26	4/	1.77	////
48		Minato-ohashi Bridge	Iwaki City	L	96	151		137			142		-	219		188			214	225		345		320	3	8	291	<u> </u>	MM	287	48	1.03	1
49	C Di	Idosawa Bridge			12	11		24			13			11		12			24	12		16		20	2	1	23		Mm	19	49	1.30	1
50	cgawa raver	Samegawa Bridge			78	58		97			42		Τ	87	T	40			68	35		82		60	4	2	61		hum	58	50	0.95	/
51	Shitoki River	Komuro Bridge	1		25	106		36			65			22		75			23	23		43		29	1	3	31		Maria	27	51	0.99	/
52		Kohana Bridge	1	-	29	29		57			85		+	79	-	98			31	76		93	-	85	4	•	93	1	wh.	73	52	0.74	/
52	Binda River	Bada Baldan	1	\vdash	112	95		120			105		+	45	-	145			117			411	-	170		60	102	\vdash	14.4	227	52	1.15	/
23		DERIGE DE REC		I	112	65		120			103			4J		143			117	77		411		170	1,0	00	103		WWW/	321	22	1.15	1
				*1: Blz	ink cells	are loca	tions v	here sa	mples w	vere not c	ollected.	The rest	ult "Ne	ot detec	table" i	is indica	ited as '	"0."							A	С	D	E		581	Average		
				*2: Ar	ithmetic	Average	; calcu	lated by	assumi	ng ND=0	; Color c	odes sho	ow cat	egories	(see th	e right)								-					-				
				*3: Re	sults of	the anal-	sis of	trends a	t respec	tive locat	ions usin	g the me	thod e	xplaines	d on 4.	.3(1)2)	~	⇒ D	ecreasin	1g -	→ Inci	reasing	~	→ Unc	hanged	~~ A F	luctuation	15					

(Hamadori, Fukushima Prefecture: river sediments) (No.3)

(ii) Nakadori

In Nakadori, Fukushima Prefecture, surveys were conducted 33 to 57 times from September 2011 to February 2017 for river sediment samples collected at 44 locations.

Regarding the concentration levels of detected values, two locations were categorized into Category B, nine locations into Category C, 14 locations into Category D, and 19 locations into Category E (see Table 4.3-7 and Table 4.3-8).

Concentration levels were generally decreasing at 42 locations and were fluctuating at two locations.

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	2	No. 87, No. 93
С	Upper 10 to 25 percentile	9	No. 59, No. 68, No. 71, No. 74, No. 76, No. 79, No. 80. , No. 82, No. 88
D	Upper 25 to 50 percentile	14	No. 56, No. 65, No. 66, No. 69, No. 70, No. 72, No. 77, No. 78, No. 81, No. 86, No. 90, No. 91, No. 92, No. 94
Е	Lower than upper 25 to 50 percentile (lower 50%)	19	No. 54, No. 55, No. 57, No. 58, No. 60, No. 61, No. 62, No. 63, No. 64, No. 67, No. 73, No. 75, No. 83, No. 84, No. 85, No. 89, No. 95, No. 96, No. 97







2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-5 Changes in concentration levels over the years at respective locations

(Nakadori, Fukushima Prefecture: river sediments)

Table 4.3-8 Detection of radioactive cesium at respective locations (Nakadori, Fukushima Prefecture: river sediments) (No.1)

		Location								Ri	iver se	diment	s/Radioactiv	e Cesi	um (Cs	s-134 + (Cs-13	7)/Con	centration(B	q/kg)(*	¹ 1)				
No.	Location 'o. Water area Location 4 Habuto Bridge		Municipality				FY2	011											FY2012						
				8	9	10	11	12	1	2	3	4	5	6	7	8		9	10	11	12	1	2		3
54	Abukuma River	Habuto Bridge	Nishigo Village		66		81		155		96		262		44				31	49	144	89			
55		Tamachi-ohashi Bridge	Shirakawa Citu		200		228		270		280		1,010 46	330	184	56	107		60	85	560	125	180		203
56	Yanta River	Before the confluence with Abukuma River	Shirakawa City		290		330		530		490		4,300		1,050				8,100	1,720	2,010	860			
57	Yashiro River	Yashirogawa Bridge	Tanagura Town		77		108		218	150			870		290				129	300	246				
58	Kitasu River	Yanagi Bridge	Hirata Village		27		165		66		70		64		65				14	57	19	72			
50	Imada Piyar	Nekonaki Bridae			45		17		0		55		680		610				105	1.450	1.150	1.180		-	
57			Ishikawa Town		4.5		47		0		55		145		50				105	1,450	1,150	0.0			
60	Yashiro River	Oji Bridge			35		30		51		52		145		50				55	98	100	98			
61	Abukuma River	Kawanome Bridge	Tamakawa Village		71		34		37		77		330 105	213	84	53	73		180	450	49	120 130	138		
62		Emochi Bridge			0		124		390		24		380		193	330				350	72	48			
63	Chalada Diana	Sukagawa City water intake point	Sukagawa City		72		97		138		126		182		77				83	168	94	108			
64	Snakado River	Before the confluence with Abukuma River			550		89		124		129		540 41	600	3,600	93 1	,050		117	890	440	96 85	75		
65	Sasahara River	Shinbashi Bridge			1,240		260		2,600	480			380		1,470			237		200	1,540	1,300			
66	Yatagawa River	Yatagawa Bridge	Koriyama City		137		79		184	160			236		140			99		81	400	340			
67		Funehiki Bridae	Tamura City		27		110		87	173			270		52		_	96		133	120	239		_	
	Otakine River	Before the confluence with	runuu cuy		27		270		07	175	2.00		6.400		32			20	100	155	1.240	242			
68		Abukuma River Before the confluence with			/50		270		134		360		6,400		215			89	108		1,340	242			
69		Babagawa River		-	700		960		1,290	1,190			183		164				110 370		199	700			
70	Ouse River	Makunouchi Bridge	Koriyama City		1,060		330		360	310			163		240			440	209		420	610			
71		Before the confluence with Abukuma River			13,500		690		860	1,540			2,020 640	690	610	290	189		820 330		360	290 420	550		
72	Abukuma River	Akutsu Bridge			7,800		116		350	350			6,000 148	169	1,410	269 3	,400		610	400	4,700	740	2,880 5	520	
73		After the confluence with Ishimuro River			1,210		184		99	122			96		74				50 116		158	63			
74	Gohyaku River	Kamisekishita Bridge			22,000		700		590	230			590		450				1,780 1,730		590	2,330			
75		Before the confluence with	Motomiya City		560		450		1.320	730			960 201	580	89	111	470		330 114		167	137	150		99
76	Abukuma Piyar	Abukuma River			20.000		610		600	440			2 200 1 840	2 160	1.280	720 1	260		490	268	770	250	268 0	70	
70	Noukuma Kiver				1,000		010		000	440	050		3,200 1,840	2,100	1,280	720	,200		450	200	110	200	200 9	//0	
11	Kuchibuto River	Kuchibutogawa Bridge	Nihonmatsu City		1,880		1,440		990		950		1,160		1,570				1,620 920			790	/80		
78	Utsushi River	Osegawa Bridge			1,780		550		330		670	610	860	640	580	234	530		610	1,260	750	250	1,130 7	20	
79	Mizuhara River	Getouchi Bridge			6,400		570		460		1,410		520		410				980	800	450		620		
80	Megami River	Tsurumaki Bridge			1,870		1,570		950		1,340		880		550				1,010	900	650		690		
81	Abukuma River	Horai Bridge			6,500		176		171		460	370	660	290	500	242	255		340	440	530	370	330 4	40	
82	Nigori River	Before the confluence with Omori River			1,160		650		530		1,090		980		590				610	410	300		1,180)	
83	Arakawa River	Hinokura Bridge			1,160		270		167		114		139		77	79				45	42		22		
84	Sukawa River	Sukawa Bridge	Fukushima City		790		137		173		199		216		125				82	74	132		84		
85	Arakawa River				1.290		460		750		1.380	990	142	760	119	280	237		161	145	117	119 220	9.500)	
07	Matauka D	Before the confluence with Abukuma River			15 200		400		200		600	4.000	144	220	175	020	000		145	172	1.540	2 500	1.070	200	
00	Maisukawa Kiver				13,200		+00		200		1.000	+,000	144	550	1/3	720 3	,500		143	1/3	1,000	5,500	1,070 4,		
87	Hattanda River	Hattanda Bridge			3,000		2,700		1,100		1,090		620		520				4,300 610		/50		2,010	,	
88	Surikami River	Totsuna Bridge			1,040		186		167	260					630			400	170		430		620		
89		Abukuma River			2,150		630		310	830		410	250	640	92	50	86		140	330	96	110 163	131		
90	Abukuma River	Taisho Bridge	Date City		14,200		2,700		153		1,160	3,800	410	3,700	73	172	219		770	1,280	1,740 1,130	780	850		
91		Tatenokoshi Bridge	Kawamata Town		440		1,030		590		770		490		530				410	590	480		390		
92	Harose River	Jizogawara Bridge			1,340		870		2,300		780		760		890	ĺ			330 580		480	410	390		
93	Oguni River	Before the confluence with	Date City		9,200		4,600		7,500		2,300	6,800	6,500	2,000	820	1,390 1	,800		890 1,290	1,150	3,000 880	1,430	2,010)	
Q.1	Hirose River	Hirose River Before the confluence with			740		1 280		980		710	2 700	20.000	650	650	430	640		720	800	300 590	610	440	+	-
	Kanahan Di	Abukuma River	Chimber Cr		107		1,200		200		122	2,700	20,000	0.00	10.1	1.0			720	0,00	300 390	510	440	+	
95	nurokawa River	i oc nigisakai	Snirakawa City		105		50		114		133		82		194	1.58	·		15		213	50		-	
96	Kujigawa River	Matsuoka Bridge	Tanagura Town		39		23		48	150			63		31	42				12	39	43		\rightarrow	
97		Takachihara Bridge	Yamatsuri Town		63		14		41	44			13		14	24				16	18	0			
				Total 1 of sa	number mples	1,818	Detec tim	ction es	1,794																

*1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0."

Table 4.3-8 Detection of radioactive cesium at respective locations

(Nakadori, Fukushima Prefecture: river sediments) (No.2)

Location Municipality FY2013 No. Water area Location Municipality 4 5 6 7 8 9 10 54 Abukuma River Habuto Bridge Nishigo Village 51 135 80 14														adioac	tive C	esium	(Cs-13	4+Cs	-137)/	Concer	tration	n(Bq/kg)	(*1)						
No	Water area	Location	Municipality						ł	FY201	3												FY2	014					
	Waler area	Locaton	maneparty	4	5	6	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9		10	11	12	1	2	3
54	Abukuma River	Habuto Bridge	Nishigo Village		51	13	35		80		14		53		25			36	28		17			23		33	52		
55		Tamachi-ohashi Bridge	Shirakawa City	77		113	57	51	46	59	39		33	53	22		40	47	17	54	30	53		24		22	12 36		
56	Yanta River	Abukuma River			2,230	1,6	30		43		380		212		234			243	244		215			279		240	241		
57	Yashiro River	Yashirogawa Bridge	Tanagura Town		170	13	32		159		135		66		71			81	52		71			51		45	51		
58	Kitasu River	Yanagi Bridge	Hirata Village		37	4	0		29		40		11		21			21	17		19			16		0	17		
59	Imade River	Nekonaki Bridge	Ishikawa Town		116	24	18		42		179		15		120			78	0		139			14		63	203		
60	Yashiro River	Oji Bridge	isindawa rown		71	8	0		46		127		64		54			16	24		24			22		23	78		
61	Abukuma Divar	Kawanome Bridge	Tamakawa Village	108		57	63	40	31	38	50		72	69	69		15	57	78	18	49	24		58		33	64	58	
62	Pioukuma Kivei	Emochi Bridge			68	1	9		13		35		13		17			39	12		10			11		12		27	
63		Sukagawa City water intake point	Sukagawa City		109	17	15		113		47		63		51			37	58		28			11		27		138	
64	Shakado River	Before the confluence with Abukuma River		282		107	80	88	51	59	58		18	73	67		80	66	57	42	18	31		51		26	52	80	
65	Sasahara River	Shinbashi Bridge			240	73	80		102		106		114		199			75	148		99			114		85	131		
66	Yatagawa River	Yatagawa Bridge	Koriyama City		85	5	7		49		66		39		61			49	61		25			17		25	19		
67		Funehiki Bridge	Tamura City		132	9	8		35		69		110		75			38	65		53			42		25		112	
68	Otakine River	Before the confluence with			213	4	9		370		73		66		64			69	21		64			60		51	60		
69		Before the confluence with			106	9	6		60		50		56		87			90	71		64			66		49	18		
70	Ouse River	Makunouchi Bridge			450	66	50		241		298		174		178			390	206		139			237		202	264		
71		Before the confluence with	Koriyama City	800		241	390	232	224	295	129		194	233	187		165	263	194	208	186	272	2	126		180	154	199	
72	Abukuma River	Abukuma River Akutsu Bridge		220		197	280	400	233	251	113		114	90	103		101	145	177	146		344	136	114		179	107	444	
73		After the confluence with			83	8	5		42		21		40		30			24	38		24			32		33	28		
74	Gobyaku River	Ishimuro River			67	13	30		222		810		13/		116			181	134		124		_	1.080		362	174		
75	oonyaka raver	Before the confluence with	Motomiya City	00	0/	157	210	170	50	101	40		51	19	07		59	101	86	01	124	10		48		25	26	20	
75	Alashara Diasa	Abukuma River		00		137	310	2/9	1.020	256	49		31	10	97		50	205	220	91	129	207	205	46		23	30	50	
70	Abukuma River	Takada Bridge	NTI Circ	1,570	1.010	540	285	300	1,020	256	380		400	/30			570	505	229	1,070	400	387	305	250		570	264	690	
//	Kuchibuto River	Kuchibutogawa Bridge	Nihonmatsu City		1,210	90			570		900		880					590	470		490			365		283	303		
/8	Utsushi River	Osegawa Bridge		2,380		191	144	360	154	212	229		244	350			300	118	179	134		132	149	246		130	162	122	
79	Mizuhara River	Getouchi Bridge		-	930	43	50		229		302		321			-		169	141		1/1			268		165		187	
80	Megami River	Tsurumaki Bridge			680	54	10		330		410		440		510			233	317		600			169		200		238	
81	Abukuma River	Horai Bridge Before the confluence with		320		235	250	259	242	440	318		390	520	490		198	341	219	600	310	185	;	220		278	166	216	
82	Nigori River	Omori River			650	1,0	30		2,880		740		610					1,290	1,050		720			370		299	322		
83	Arakawa River	Hinokura Bridge			61	7	7		72		22		29		38			24	15		16			17		23	18		
84	Sukawa River	Sukawa Bridge	Fukushima City	-	87	11	9		87		44		99					33	38		31			75		60	40		
85	Arakawa River	Before the confluence with		340		500	135	85	200	380	122		143	112			96	85	70	71	79	76		66		67	67	61	
86	Matsukawa River	Abukuma kiver		149		119	152	137	1,100	277	129		137	1,580	105		257	167	305	1,590	71	3,06	0	98		25	287	75	
87	Hattanda River	Hattanda Bridge			1,260	1,2	20		470		570		1,560		2,480			510	700		910			420		1,440	490		
88	Surikami River	Totsuna Bridge			300	51	0		8,300		176		3,500		1,250			1,050	880		440			94		381		450	
89		Before the confluence with Abukuma River		154		108	157	179	300	124	76		66	50	63		112	52	68	99	58	33		500		44	33	44	
90	Abukuma River	Taisho Bridge	Date City	1,460		750	285	193	297	1,000	280		98	123	152		135	78	132	100		95	287	110		77	85	71	
91	Henne Diver	Tatenokoshi Bridge	Kawamata Town		350	31	9		390		370		300					241	165		168			213		125	130		
92	LILUGE KIVEI	Jizogawara Bridge			257	37	70		296		289		197		193			297	211		177			207		196		200	
93	Oguni River	Before the confluence with Hirose River	Date City	1,910		2,860	2,070	1,930	1,190	1,110	1,590		1,310	1,420	1,040		890	580	520	610	560	730)	450		730	570	620	
94	Hirose River	Before the confluence with Abukuma River		790		520	540	910	278	470	360		490	510	550		560	530	530	710		1,140	246	254		344	153	152	
95	Kurokawa River	Tochigisakai	Shirakawa City		143	15	53		65		64		127		89			138	109		52			71		78	82		
96		Matsuoka Bridge	Tanagura Town		11	5	5		40		12		12		18			0	13		12			22		0	14		
97	Kujigawa River	Takachihara Bridge	Yamatsuri Town		27	1	3		14		10		15		11		l	11	0		13			11		0	0		
				*1: Bla	nk cells	are loca	tions w	here sa	mples w	vere not	collect	d. The	result "I	Not det	ectable"	is indic	ated as	"0."											

Table 4.3-8 Detection of radioactive cesium at respective locations

(Nakadori, Fukushima Prefecture: river sediments) (No.3)

Ne Area Probability Area Probability Markade Probability	So No. Corr 54	perficient of variation Trends(*3) 0.955 // 1.59 // 1.86 // 1.255 // 0.98 // 1.55 // 0.700 //
Image: bolic boli	54 55 56 57 58 59 60 61	0.95 / 1.59 / 1.86 / 1.25 / 0.98 / 1.55 /
54 Maine Ridegies Naining Ridegies Naininformation Naining Ridegies	54 55 56 57 58 59 60 61	0.95 / 1.59 / 1.86 / 1.25 / 0.98 / 1.55 / 0.70 /
55 56 <th< td=""><td>55 56 57 58 59 60 61</td><td>1.59 1.86 1.25 0.98 1.55 0.70</td></th<>	55 56 57 58 59 60 61	1.59 1.86 1.25 0.98 1.55 0.70
5 Marker Marker	56 57 58 59 60 61	1.86 1.25 0.98 1.55 0.70
57 Yahirogawa Bridge Tanguar Town C 73 42 C 63 C 93 10 C 10	57 58 59 60 61	1.25 > 0.98 > 1.55 > 0.70 >
58 Kasa New Yangi Ridge Hara Nige - 1	58 59 60 61	0.98 1.55 0.70 0.70
9 Indexerve Notanitability Difference 1	59 60 61	1.55
60 Yankuro Rover 09 Bridge Diskura Yanov 7 9.4 3.1 7 2.1 2.1 3.1 2.1 <td< td=""><td>60 61</td><td>0.70</td></td<>	60 61	0.70
61 Abokana River Assama Reide Assama Reide Assama Village 44 17 24 36 25 22 19 3 34 19 20 27 18 24 25 11 20 31 23 12 18 M	61	
Abukuma River		1.16
62 Enochi Bridge 14 12 15 16 32 12 16 18 12 23 21 10 10 17	62	1.63
63 Sokagawa City water initial Sokagawa City and Final Sokagawa City and Sokagawa Ci	63	0.61
Statuta River Point Point	64	2.62
Abdum River 1 12 11 12 12 12 12 12 12 12 12 12 12 1	65	1.52
O Design and refer Sector TO TO <thto< th=""> TO TO TO<td>66</td><td>1.00</td></thto<>	66	1.00
	00	1.09
67 Pandrak Bridge Tanux Cry 33 22 28 29 2 28 35 2 2 36 ////////////////////////////////////	6/	0.83
68 Advison Biore Constraints 24 20 1,120 27 40 40 24 13 1,170 32 57 59 1 1 1 1 2 2 2 3 1 1 1 1 1 1 1 1 1 1 1 1	68	2.68
Ø9 Babugara Röver 93 36 71 24 30 22 80 43 94 49 47 42 59	69	1.57
Makanochi Bedge 210 183 203 270 224 151 163 180 110 117 204 Johnson 157	70	0.66
Protocol me continuence with a backing key metric and	71	3.09
72 Abakuma Revie Akanua Revie Akanua Revie 116 228 78 195 97 150 25 169 138 105 162 151 102 100 139 112 163 49 91 58 Mutual 113	72	2.29
73 After the confluence with Libinum Knewr 22 29 18 21 20 42 40 22 33 20 24 36 29 29	73	2.31
74 Gobyaka River Kamisekishan Bridge 186 186 18 18 107 79 73 50 195 492 79 115 522 242	74	3.47
75 Before the configurate of the configuration of t	75	1.52
76 Abskums Rever Takah Bridge 480 3.55 3.64 1.48 9.9 3.2 2.0 3.7 3.15 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1	76	3.54
77 Kachbuto River Kachbutogava Bridge Noomatsu Cry L 431 158 2 09 2 36 19 143 L 158 2 109 143 158 2 109 143 158 2 109 143 158 2 109 143 158 2 109 143 158 158 158 158 158 158 158 158 158 158	77	0.77
78 [bush River Oregows Bridge 268 164 228 207 142 156 102 105 144 76 16 167 144 39 71 64 62 65 142 25 24 100 100 100 100 100 100 100 100 100 10	78	1.22
79 Muruhara River Getouchi Bridge 20 106 224 246 167 187 165 152 292 318 94 139 158 192	79	1.98
80 Mezarii Kiver Tsurumaki Rider	80	0.83
81 Advansa Rover Heral Reference	81	212
92 Nurvi Piere Before the confluence with 778 810 708 820 720 720 751 751 751 751 751 751 751 751 751 751	61	0.76 ΔΔΔ
	02	2.47
	63	2.47
	84	1.4/
Image: Note that we have a second conditional and the second conditis and the second conditional and the second conditional and the s	85	3.47
86 Masukawa River 850 34 720 259 183 16 1,120 39 31 84 27 252 68 214 75 173 28 271 174 96 UMALLA 138	86	2.42
87 Hattanda Rivie Hattanda Rivie 378 510 569 483 580 620 1,180 1,430 327 194 269 750 1/100 092	87	0.85
88 Total Bridge 1,760 229 206 125 158 169 212 224 341 230 321 396 216 287	88	1.93
80 Before the confluence with the confluence w	89	1.83
90 Abukuma River Taisho Bridge Date City 276 39 148 148 55 380 49 26 39 112 26 45 113 68 34 28 41 85 67 60 40 40 41 41 41 41 41 41 41 41 41 41 41 41 41	90	2.74
91 Taemkoshi Bridge Kawamata Town 152 200 129 143 137 135 128 59 109 68 68 80 1	91	0.75
9 Roopewara Bridge 227 175 2 304 59 81 61 10 108 100 71 37 3 3 3 7 4 6	92	1.17
93 Ogain Reve Hore he confluence with Hore Revents Date Cay 630 490 650 3.270 680 251 285 2 368 288 216 3 36 374 269 388 1.510 309 373 2 20 406 363 2 10 10 10 10 10 10 10 10 10 10 10 10 10	93	1.22
94 Marce Rever Machine entreman 201 and 201 an	94	3.22
98 Kurskawa River Tochigisakai Shirakawa City 92 217 522 63 46 42 69 63 40 36 69 23 Landon 50	95	0.83
96 Musuoka Bridge Tanagara Town 0 16 0 19 12 15 23 0 0 1 11 0 1 1	96	1.21
Kujigova River Takachhara Breige Yamatsuri Towa 11 0 10 0 0 0 0 0 0 10 10 10 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	97	1.10
	Average	. >
	. werage	

(iii) Aizu

In Aizu, Fukushima Prefecture, surveys were conducted 25 to 50 times from September 2011 to January 2017 for river sediment samples collected at 26 locations.

Regarding the concentration levels of detected values, one location was categorized into Category B, one location into Category C, four locations into Category D, and 20 locations into Category E (see Table 4.3-9 and Table 4.3-10).

Concentration levels were generally decreasing at 20 locations and fluctuating at six locations.

Table 4.3-9 Categorizations of detected values at respective locations

(Alzu, Fukushima Prefecture: river sedimen
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Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	1	No. 106
С	Upper 10 to 25 percentile	1	No. 121
D	Upper 25 to 50 percentile	4	No. 102, No. 107, No. 116, No. 120
Е	Lower than upper 25 to 50 percentile (lower 50%)	20	No. 98, No. 99, No. 100, No. 101, No. 103, No. 104, No. 105, No. 108, No. 109, No. 110, No. 111, No. 112, No. 113, No. 114, No. 115, No. 117, No. 118, No. 119, No. 122, No. 123





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-6 Changes in concentration levels over the years at respective locations (Aizu, Fukushima Prefecture: river sediments)

			רובט	, , , ,	JINU	51111	Παι			uic			scu		1113) (1)	0.1)							
		Location					EVO	Ri	iver se	diment	ts/Radi	oactiv	e Cesi	ım (Cs	-134+	-Cs-13	7)/Con	centra	tion(B	q/kg)(*	*1)				
No.	Water area	Location	Municipality	8	9	10	FY2	12	1	2	3	4	5	6	7	8	9	FY2	012	11	12	1		2	3
98		Tajima Bridge	Minamiaizu Town	0	0	10	0		0		0		13	0	0	50				0					5
99	Agano River	Okawa Bridge			27		13		0		0		26		0	0				0	0				
100		Takimi Bridge	Aizuwakamatau		290		320		256		228		290		120	211		12	3		124			111	
101	Yukawa River	Shinyukawa Bridge	City		8,700		3,000		500		175		640		390	350				410	236			104	
102	•	Before the confluence with Agano River			2,300		240		550		420		132		400	0				440	153				
103	Miyakawa River	Saikuna Bridge			126		175		126		530		203		133	99				122	55			170	
104	Agano River	Miyako Bridge	Aizubange Town		380		134		142				0		17	42				0	0			11	
105	Nippashi River	Minami-ohashi Bridge	Kitakata City		167		158		130		1,300		1,240		101	270		173	132	263	350	530	590	480	
106	Kyu-yukawa River	Awanomiya Bridge	Yugawa Village		13,000		25,000		2,260		930		2,010		470	1,080				207		72	2,590		
107	Kyu-miyakawa River	Josuke Bridge	Aizubange Town		610		520		216				181		257	202				450	265				
108	Tatsuki River	Ohashi			670		199		67				250		157	112		19	8			86	121		
109	Tulbuki Hiver	Shimokawara Bridge	Kitakata City		340		169		320		610		260		66	87		37	0			67	730		
110	Nigori River	Nigorigawa Bridge	Ruakata City		69		36		30				57		71	28				24		16	51		
111		Yamazaki Bridge			180		139		350				82		90	82		6	1			40	350		
112	Inagawa River	Aoyagi Bridge	Minamiaizu Town		0		0		0		0		0		0	0				0	0			0	
113	inagawa Kivei	Kurosawa Bridge	Tadami Town		0		0		10		44		0		0	0				0		()		
114	Tadami River	Nishitani Bridge	Kaneyama Town		0		0						0		0	0		C	1			0	0		
115		Fuji Bridge	Aizubange Town		14		0		0	51			13		0	32		1	2	226	241				
116	Agano River	Shingo Dam	Kitakata City		129	-	1,220						540		260	270		18	3						-
117	Sukawa River	Sukawano			161		52		218				61		123	169		58	39	213	86	1	8		
118	Nagase River	Kogane Bridge			24		52		0				52		360	71	59	7	8	340	42	47	55	220	
119	Takahashi River	Shinbashi Bridge	Inawashiro Town											190	26		208			89					244
120	Koguro River	Umeno Bridge												270	300		410			2,330		48	30	73	
121	Hishinuma River	Sekido District												700	90		2,090	6	7			520	360		
122	Funatsu River	Funatsu Bridge	Koriyama City											32	10		0			31		17	21		
123	Haragawa River	Estuary, front	Aizuwakamatsu City											0	670		0	4	7			1	3		27
				number mples nk cells	822 are loca	Deter tim ations w	ction ies ihere sa	594 mples w	ere not	collecte	d. The	result "	Not det	ectable"	'is indic	ated as	"0."								

Table 4.3-10 Detection of radioactive cesium at respective locations

(Aizu, Fukushima Prefecture: river sediments) (No.1)

			(A	izu	, Γ ι	iku	SIII	ma	PI	eie	ciu	ie.	nve	15	eui	Location River sediments/Radioactive Cesium (Cs-134+Cs- FY2013 varea Location Municipality 4 5 6 7 8 9 10 11 12 1 2 3 4													
	1	Location	I							River	sedin	ents/R	adioac	tive C	esium	(Cs-13	4+Cs	-137)/0	Concer	ntratio	n(Bq/k	g)(*1)							
No.	Water area	Location	Municipality						1	FY201:	3							-			-	FY2	2014						
				4	5	6	1	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
98	Agano River	Tajima Bridge	Minamiaizu Town		0	0			0		0		0					0	0		0		0		0				
99		Okawa Bridge			10	0			0		104		100	100				0	106		0		0		0				
100		Takimi Bridge	Aizuwakamatsu City		184	98			112		124		100	120				98	126		69		312		720				
101	Yukawa River	Before the confluence			1,410	105			122		8/		100	117				100	159		80 72		82		720				
102	Minakama Biyar	with Agano River			60	62			152		10		69 56	53				109	72		41		36		67				
103	A sees Diver	Minute Deider	Aizubange Town		09	02			02		40			0				10	0		41		50		07				
104	Ninnachi Biyar	Minami ahashi Bridaa	Kitakata Citu		99	0	108	105	103	97	70		41	100	85		71	11	0	20	0	18	0		0				
105	Kyu-yukawa	Awanomiya Bridge	Yugawa Village		279	410	108	105	103	87	70		88	139	85		/1	40	570	20	580	10	690						
107	River Kyu-miyakawa	Josuke Bridge	Aizubange Town		181	219			161		131		236	142				134	64		68		172						
108	River	Ohashi			118	152			17		14		25	26				26	29		16		27						
109	Tatsuki River	Shimokawara Bridge			80	40			39		28		121	87				23	14		11		21						
110		Nigorigawa Bridge	Kitakata City		11	0			47		10		0	48				10	249		16		12						
111	Nigori River	Yamazaki Bridge			41	43			0		0		0					25	0		0		0						
112		Aoyagi Bridge	Minamiaizu Town		0	0			0		0		0					0	0		0		0						
113	Inagawa River	Kurosawa Bridge	Tadami Town		0	0			0		0		0					0	0		0		0						
114		Nishitani Bridge	Kaneyama Town		0	0	-		0		0		0	0				0	0	-	0	-	0		19				
115	I adami Kiver	Fuji Bridge	Aizubange Town		12	36			11		0		0					13	21		99		56						
116	Agano River	Shingo Dam	Kitakata City		340	309			137		163		251					308	36		296		272						
117	Sukawa River	Sukawano			83	76	44	73	70	78	63		21				55	79	78	27	34	46	50		24				
118	Nagase River	Kogane Bridge			40	35	87	23	42	19	45		32	24	62		36	61	125	37	26	94	65						
119	Takahashi River	Shinbashi Bridge	Inawashiro Town		267	122			23		29							78	59		44		67						
120	Koguro River	Umeno Bridge			42	94			183		184		324					284	149		133		188						
121	Hishinuma River	Sekido District			480	74			272		115		223					28	56		211		122						
122	Funatsu River	Funatsu Bridge	Koriyama City		40	33			36		34		0	24				10	104		23		52						
123	Haragawa River	Estuary, front	Aizuwakamatsu City		16	28	-		12		0		0	11				92	22	-	19	-	17						
				*1: Bla	nk cells	are loc	cations v	where s	samples	were r	ot colle	cted. T	he resul	lt "Not	detecta	ble" is	indicate	d as "0.	,,										

Table 4.3-10 Detection of radioactive cesium at respective locations

(Aizu, Fukushima Prefecture: river sediments) (No.2)

					(A	۱z	u,	Fu	ku	sh	im	a F	^{>} re	efe	ctu	ıre	: ri	ve	r s	ed	lim	en	its)	۹) ا	ا ٥.	3)						
		Location								R	liver so	edimer	nts/Rac	lioacti	ve Ces	ium (C	s-134	+Cs-1	37)/Co	ncentr	ration(E	3q/kg)((*1)						Average of		Coefficient	
No.	Water area	Location	Municipality	L			<u> </u>		Fy2	.015				<u> </u>					<u> </u>	<u> </u>	FY2	016			— ———————————————————————————————————	<u> </u>		Changes	FY2016 (*2)	No.	of variation	Trends(*3)
	└───'	<u> </u> '		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	1				
98	Agano River	Tajima Bridge	Minamiaizu Town	⊢	0	0	\vdash	0	\vdash	0	\square	0	0	\vdash	$\mid \mid \mid$	\square	0	0	\vdash	0		0	\vdash	0	\square	\vdash	\vdash		0	98	4.38	
99	<u> '</u>	Okawa Bridge	4 '	\vdash	0	0	\square	0	$ \square$	0	\square	0	0	\square	\square	\square	0	0	\square	0		0	\square	0		\vdash		<u></u>	0	99	2.82	\searrow
100		Takimi Bridge	Aizuwakamatsu City	\vdash	48	77	\square	70	$ \square$	39		69	39	\square	\square	\square	49	48	\square	41		37	\square	36	42	\square		muh	42	100	0.71	\searrow
101	Yukawa River	Shinyukawa Bridge	City		71	81	\square	78	⊢	70		63	68	\square		\square	20	24	\square	27		73		39	56	\square	\square	L	40	101	2.83	\searrow
102	ļ'	Before the confluence with Agano River	ļ!		108	122	Ш	89	\square	134		37	42	\square			56	43	\square	188		40		29		\square		human	71	102	1.90	$\overline{}$
103	Miyakawa River	Saikuna Bridge	Aizubange Town		19	15	Ш	15		23		37	31	\square			15	13		32		11		11	0	\square		L.	14	103	1.25	\searrow
104	Agano River	Miyako Bridge	rationinge		0	10		0		0		0	0				0	0		0		0		0	0			L	0	104	3.15	~
105	Nippashi River	Minami-ohashi Bridge	Kitakata City	77	70	19	89	24	42	27		31	115	119		24	0	16	27	83	18	14		17	126			An	36	105	1.65	$\overline{}$
106	Kyu-yukawa River	Awanomiya Bridge	Yugawa Village		810	51	\square	179		386		177	760				617	537		253		81		810	777			1	513	106	2.75	\searrow
107	Kyu-miyakawa River	Josuke Bridge	Aizubange Town		63	33	\square	119		79		0	88				78	88		32		69		190				Lun	91	107	0.82	
108		Ohashi			18	35	\square	24		28		24	14				36	19		0		14		20				human	18	108	1.53	
109	Tatsuki River	Shimokawara Bridge	1 1		17	32	\square	19		0		31	26				14	12		16		0		10	14			M	11	109	1.56	
110	, 	Nigorigawa Bridge	Kitakata City		0	0	\square	0		0		0	0				11	0		0		11		0	0			mul	3.7	110	1.80	۸۸۸.
111	Nigori River	Yamazaki Bridge	1 1		0	0	\square	0		0		0	0				0	0		14		0		0				M.	2.8	111	1.83	
112		Aoyagi Bridge	Minamiaizu Town		0	0	\square	0		0		0	0				0	0		10		0		0	0	\square		h	1.7	112	-	
113	Inagawa River	Kurosawa Bridge	Tadami Town		0	0	\square	0		0		0					0	0		0		0		0				λ	0	113	4.39	$\overline{\langle \cdot \rangle}$
114		Nishitani Bridge	Kaneyama Town		0	0	\square	0		0		0	0				0	0		0		0		0					0	114	5.48	
115	Tadami River	Fuji Bridge	Aizubange Town		15	29	\square	208		13		0	0				0	0		23		15		0				Int	7.6	115	1.76	
116	Agano River	Shingo Dam	Kitakata City		208	206	\square	95		87		114	141			\square	256	22		81		126		257	161			Ann	151	116	0.94	
117	Sukawa River	Sukawano		26	18	12	87	27	17	32			18	14		34	18	15	26	37	35	14		17	14			Monum	23	117	0.88	\searrow
118	Nagase River	Kogane Bridge	'	55	22	14	26	20	18	29		20				41	15	14	23	13	16	15		16	13			Mum	18	118	1.30	\searrow
119	Takahashi River	Shinbashi Bridge	Inawashiro Town		25	59		71		49		34	28				18	27		42		16		36	37			Mm	29	119	0.97	\searrow
120	Koguro River	Umeno Bridge	'		337	58	\square	245		103		130					150	83		95		84			54			1	93	120	1.64	\searrow
121	Hishinuma River	Sekido District	'		81	130	\square	238		119		89	87				654	121		53		680		188	539			hanner	373	121	1.33	
122	Funatsu River	Funatsu Bridge	Koriyama City		0	\square	0		0		16	0				0	0		0		0		12	0			when	2.0	122	1.30		
123	Haragawa River	Estuary, front	Aizuwakamatsu Citv	\square	17		0		0	14				13	11		13		14		27	10			L	15	123	3.08				
			<u>1999</u>	*1: Bł	ank cells	s are lor	ations 1	where s	amples	were p	not colle	cted. T	he resu	lt "Not	detecta	ıble" is i	indicate	d as "0.	."				A	в	с	D	Е		60	Average	 I	
				*2: Ar	rithmetic	Avera	ge; calc	ulated b	oy assw	ming N?	D=0; C	olor cod	des sho	w categ	ories (s	see the 1	right).											Į i	II			
				3: R¢	sults of	the ana	lysis of	trends :	at respe	ective k	ocations	using t	he meth	nod exp	dained c	on 4.3(1)2)	~	Decres	sine	\rightarrow	Increa	isino	~~	Uncha	inged	\sim	▲Fluctuations				l

Table 4.3-10 Detection of radioactive cesium at respective locations

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4) Ibaraki Prefecture

In Ibaraki Prefecture, surveys were conducted 19 to 25 times from August 2011 to February 2017 for river sediment samples collected at 53 locations (this analysis excludes the survey results from 39 locations where the survey was conducted only in 2011).

Regarding the concentration levels of detected values, two locations were categorized into Category A, one location into Category B, 13 locations into Category C, 19 locations into Category D, and 18 locations into Category E (see Table 4.3-11 and Table 4.3-12).

Concentration levels were generally decreasing at 46 locations, were unchanged at two locations and were fluctuating at five locations.

Table 4.3-11 Categorizations of detected values at respective locations (Ibaraki Prefecture: river sediments)

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	2	No. 34, No. 36
В	Upper 5 to 10 percentile	1	No. 38
С	Upper 10 to 25 percentile	13	No. 12, No. 13, No. 28, No. 29, No. 31, No. 32, No. 33, No. 37, No. 39, No. 40, No. 42, No. 48, No. 50
D	Upper 25 to 50 percentile	19	No. 1, No. 2, No. 11, No. 17, No. 18, No. 19, No. 21, No. 22, No. 23, No. 24, No. 25, No. 26, No. 27, No. 30, No. 41, No. 46, No. 49, No. 51, No. 52
Е	Lower than upper 25 to 50 percentile (lower 50%)	18	No. 3, No. 4, No. 5, No. 6, No. 7, No. 8, No. 9, No. 10, No. 14, No. 15, No. 16, No. 20, No. 35, No. 43, No. 44, No. 45, No. 47, No. 53





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-7 Changes in concentration levels over the years at respective locations

(Ibaraki Prefecture: river sediments)

	Location Riverse restrict restrind restrict restrict rest																								
No.		Water area	a	Location	Municipality		1		FY20	011								:	FY2012	2			-		
			1			8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1			Satone River	Yamagoya Bridge			2,000					760			166				121			153		\rightarrow	105
2				Murayama Bridge	Kitaibaraki City		710					450			125				540			176	4	-60	
3			Hanazono River	Kurabeishi			250					144			102				42			88		66	
4	Taga Riv	ver System		Isonare Bridge			300					103			53				76			68	:	50	
5			01: P	Sakae Bridge	Takahagi City		3,100					310			101				50			87		14	
6			Okita River	Sakai Bridge	Kitaibaraki City		2,200					750			109				103			310	1	86	
7			Hananuki River	Shinhananuki Bridge	Takahagi City		650					400			248				82			82	1	02	
8				Yamagata	Hitachiomiya City		1.040					157			62				0			10	1	11	
0	Kujigawa I	River System	Kujigawa River	Sakaki Bridaa	Hitachi City/Tokai		200					44			11	0	0	0	161			156	1	35	
10				Namaki binge	Village Hitachiomiya		160					52			12	0	0	0	161			00	-	12	
10			N.I.	Nogueni	City/Shirosato Town		5.500					70			15				105			00		15	
11		Nakagawa River Area	Nakagawa River	Shimokunii	Mito City Mito City/Hitachinaka		5,500					/8			10				128			110	- 2	.40	
12				Katsuta Bridge	City	-	4,400					60			86	34	330	176	114			760	3	40	
13	Nakagawa		Nakamaru River	Yanagisawa Bridge	Hitachinaka City			4,400				1,810			690				1,200			510	8	<i>;</i> 90	
14	River System		Hinumamae River	Nagaoka Bridge				460								158						109			
15			Hinuma River	Takahashi	Ibaraki Town			84								270						57			
16		Hinumagawa River Area	Kansei River	Kansei Bridge				167					L			92						139		_[
17			Daiya River	Oya Bridge	Hokota City			320								630					_	143		T	
18			Hinuma River	Hinuma Bridge	Mito City/Oarai Town			630				570				1,260			36			330	5	60	_
19		с	Hokota River	Asahi Bridge			390					390				270			420			370	3	80	-
20			Tomoe River	Shintomoegawa Bridge	Hokota City		280					690		-		220			370			540	1	59	
21			Taivo River	Tazuka Bridge			720									108			330			159	1	72	
21							720	460								100			620			200		72	
22		Kitaura River Area	Takeda River	Uchijuku-ohashi Bridge	+			460								152			630			380	2	.30	
23			Yamada River	Nioroshi Bridge	Namegata City			600								390			174			35	1	.90	
24			Kurakawa River	Kurakawa Bridge	-			1,020								239			187			290	1	.83	
25			Gantsu River	JA Yokohashi Bridge				320								260			223			264	1	.66	
26			Nagare River	Suhoi Bridge	Kashima City			1,260								830			490			590	3	;70	
27			Sonobe River	Sonobeshin Bridge	Omitomo Citu		280								260				1,370			290	9	10	
28			Sanno River	Tokoro Bridge	Olinkania City		1,920					1,950			1,550				900			1,510	1,	,470	
29			Koise River	Heiwa Bridge	Ishioka City		194								830				680			770	2	210	
30			Kajinashi River	Kamishuku Bridge	Namegata City		270								42				197			172	2	26	
31			Hishiki River	Hishiki Bridge			1,320					1,070			860				660			610	6	i30	
32			Ichinose River	Kawanaka Bridge	Kasumigaura City		1.870					1.540			950				530			920	7	/30	
33			Sakai River	Sakai Bridge/National Route			2 300					760			780				680			112	1	60	
24		Kasumigaura River Area	Chi-home Disco	354 Shintar Briday	Tsuchiura City		2,500	5 500				4 400			000				4.000			2210		240	
34			Shinkawa River	Shinten Bridge	Tsuchiura			5,500				4,400			900				4,000			2,210	2,	.540	
35	Tonegawa		Sakura River	Eiri Bridge	City/Tsukuba City		58					136			62				270			213	1	28	
36	River System		Bizen River	Bizengawa Bridge	Tsuchiura City			2,600				228			4,800				4,500			2,800	2,	,150	
37			Hanamuro River	Shinwa Bridge				1,390				820			1,280				1,000			29	5	70	
38			Seimei River	Katsuhashi Bridge	Ami Town			1,420				5,800			2,130				1,790			4,100	3,	,500	
39			Onogawa River	Okuhara-ohashi Bridge	Ryugasaki City/Ushiku City		260					220			620				570			980	9	90	
40			Shintone River	Shintone Bridge	Inashiki City		220								330				270			400	4	40	
41		Hitachitonega	Yorokoshi River	Horinouchi Bridge				290								310			290			196	2	22	
42		wa River Area	Maekawa River	Ayame Bridge	itako City			510								580			470			500	5	580	
43				Kawashima Bridge	Chikusei City			0				0				32			0			0		14	
44		Kinugawa	Kinugawa River	Takishita Bridge	Moriya City			130				202				100 40	119	11	196			380	,	289	
45		River Area	Tagawa Diyar	Tagawa Bridge				1.080				201				10	,		146			24		54	
-13 AC			- again a Kiver	Kuroko Beidaa	Chikusei City	620		1,000		-		142	-			212		-	260			152		262	
40			Kokai River	Ratoko bridge	Turke C'	020		500				142				213			209			133	-	75	
47		Kokaieawa		Fumimaki Bridge	1 oride City			500				310				68			350			112	-+	15	
48		River Area	Yatagawa River	Maruyama Bridge				660								1,800						840		\downarrow	
49			Nishiyata River	Sakaimatsu Bridge	Tsukuba City			500								1,000						750	\square	$ \downarrow$	
50			Inari River	Oguki Bridge				1,900				1,190				1,610			1,470			1,580	1,	,250	
51				Kurihashi Bridge	Koga City		1,440					159				52 48	42	18	123			39	:	22	
52		Tonegawa River Area	Tonegawa River	Fukawa	Tone Town		820					330				320			95			122			
53				Sawara	Inashiki City		1,220					330			195	202	181	39	140			133	2	256	
						Total nu	umber of	1,150	Dete	ction	1,116														
						*] · Rlor	nk celk «	ire loca	tions w	here e	amplee	were -	not coll	ected '	The rec	ult "Not detec	table"	is india	ated as	"0"					
						. Didi	cens e				pics						R	arule	ds	0.					

Table 4.3-12 Detection of radioactive cesium at respective locations (Ibaraki Prefecture: river sediments) (No.1)

					(Ibaraki P	ret	ect	tur	e:	rive	er seo	dim	ner	nts)) (N	lo.	2)											
			Lo	ocation							FY2013	ne nts/l	Radio	active	Cesiu	m (Cs	-134-	Cs-1	.37)/C	oncen	tratior	(Bq/l	kg)(*1) 2014)				
No.		Water area	a	Location	Municipality	4	5	6	7	8	9 10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1				Yamagoya Bridge			97			81		52			49			55			44			66			23	
2			Satone River	Murayama Bridge			126			116		187			128			137			81			234			137	
3				Kurabeishi	Kitaibaraki City		36			45		91			94			56			89			60			21	
4	Taga Ri	ver System	Hanazono River	Isonare Bridge	+		50			38		47			89			54			57				112		155	
5	č			Sakae Bridge	Takahagi City		42			21		30			73			12			0			92			11	
6			Okita River	Sakai Bridea	Kitaibaraki Citu		101			68		98			83			50			50			/2	24		61	
7			II	Shink an and Deide a	Talahasi City		101			115		140			101			141			102			192	24		161	
1			riananuki Kivei	Siminananuki Bridge			155			115		140			101			141			100			102			151	
8	Kujigawa	River System	Kujigawa River	Yamagata	Hitachiomiya City Hitachi City/Tokai		60			94		45			20			10			24			12			15	
9				Sakaki Bridge	Village Hitachiomiya		55			111		92			0			49			18			14			14	
10				Noguchi	City/Shirosato Town		11			15		18			12			15			11			12			0	
11		Nakagawa Biyos Asso	Nakagawa River	Shimokunii	Mito City		101			131		76			249			73			369			62			142	
12		Kivei Area		Katsuta Bridge	City		1,110			600		13			670			258			274			170			202	
13	Nakagawa		Nakamaru River	Yanagisawa Bridge	Hitachinaka City		1,110			880		700			560			730			810			700			680	
14	River System		Hinumamae River	Nagaoka Bridge			510			90		226			193			312			188			61			126	
15			Hinuma River	Takahashi	Ibaraki Town		19			39		16			18			480			55			16			13	
16		Hinumagawa River Area	Kansei River	Kansei Bridge			159			82		79			86			51			24			113			31	
17			Daiya River	Oya Bridge	Hokota City		810			310		204			68			400			290			137			77	
18			Hinuma River	Hinuma Bridge	Mito City/Oarai Town		190			430		400			440			550			390			364			442	
19			Hokota River	Asahi Bridge			370			182		68			73			163			182			352			113	
20			Tomoe River	Shintomoegawa Bridge	Hokota City		410			600		314			87			156			99			348			242	
21			Taivo River	Tazuka Bridge			320			320		136			198			174			93			154			141	
22			Takada Diwar	Lichinku obschi Bridea			177			260		201			254			190			228			238			220	
22		Kitaura River Area	Vanada Diana	Nieseski Deiden	-		204			142		127			2.54			190			165			125			114	
23			Yamada River	Nioroshi Bridge	Namegata City		504			145		137			217			92			105			155			114	
24			Kurakawa River	Kurakawa Bridge	-		98			100		105			222			319			58			117			121	
25			Gantsu River	JA Yokohashi Bridge			211			195		164			151			185			77			110			122	
26			Nagare River	Suhoi Bridge	Kashima City		530			340		236			156			182			219			188			144	
27			Sonobe River	Sonobeshin Bridge	Omitama City		430			570		223			281			800			11				97		162	
28			Sanno River	Tokoro Bridge			860			820		730			1,800			31			680				368		590	
29			Koise River	Heiwa Bridge	Ishioka City		153			135		116			101			263			34				31		70	
30			Kajinashi River	Kamishuku Bridge	Namegata City		154			163		97			120			57			88				55		68	
31			Hishiki River	Hishiki Bridge	Kanada Cina		600			530		540			405			610			364				301		324	
32			Ichinose River	Kawanaka Bridge	Kasumigaura City		840			650		880			530			284			830				460		382	
33		Kasumigaura	Sakai River	Sakai Bridge/National Route			160			224		296			178			70			37				46		80	
34		River Area	Shinkawa River	Shinten Bridge	Tsuchiura City		4,100			4,200		3,900			2,170			1,640			1,640				1,480		1,410	
35			Sakura River	Eiri Bridge	Tsuchiura Circutturlarka Circu		76			52		39			126			73			79			21			37	
36	Tonegawa River		Bizen River	Bizengawa Bridge	City/Tsukuba City		1,770			1,860		1,360			1,540			1,490			1,110			350			720	
37	System		Hanamuro River	Shinwa Bridge	Tsuchiura City		810			790		790			1.200			830			930			432			396	
20			Caimaai Dirran	Katauhashi Baidaa	Ami Torre		1 200			1.170		040			870			610			070			020			700	
20			O	Oleshara ahashi Deidaa	Ryugasaki City/Ushiku		0.60			010		420			620			610			450			420			520	
39			Onogawa Kiver	Okunara-onasni Bridge	City		900			910		420			210			010			430			432			320	
40			Shintone River	Shintone Bridge	Inashiki City		370			350		420			318			11			249			199			194	
41		Hitachitonega wa	Yorokoshi River	Horinouchi Bridge	Itako City		210			530		117			430			34			36			22			329	
42		River Area	Maekawa River	Ayame Bridge			630			430		200			400			16			430			409			473	
43			Kinugawa River	Kawashima Bridge	Chikusei City		18			0		0			16			17			20			0			0	
44		Kinugawa River Area		Takishita Bridge	Moriya City		187			83		113			133			213			75			56			90	
45			Tagawa River	Tagawa Bridge	Chikusei City		35			40		36			52			65			16			17			16	
46			Vokoj Biyor	Kuroko Bridge	Chikuser City		226			300		186			275			131			13			23			76	
47			Kokai River	Fumimaki Bridge	Toride City		98			73		75			120			150			57			53			50	
48		Kokaigawa River Area	Yatagawa River	Maruyama Bridge			1,660			1,610		620			440			212			660				171		177	
49		idia incu	Nishiyata River	Sakaimatsu Bridge	Tsukuba City		1,160			630		420			244			37			208			450			30	
50			Inari River	Oguki Bridge	1		1,770			2,150		720			680			640			710				610		460	
51				Kurihashi Bridee	Koga City		109			55		23		-	26			149			42			20			29	
52		Tonegawa	Tonegawa River	Fukawa	Tone Town		290			171		202			62			57			100			236			65	
52		River Area	- Suchawa Kivel	Sawara	Inachiki City	-	117	_		101		115			80			11			14			00			15	
Kiver Area Sawara Inashki City 117 101 115 88 11 14 90													1.3															
						*1: BI	ank cell	ls are l	ocatio	is whe	re samples w	ere not	t collec	ted. T	he resu	lt "Noi	detec	table"	is indic	ated as	s "0."							

Table 4.3-12 Detection of radioactive cesium at respective locations

Table 4.3-12 Detection of radioactive cesium at respective locations (Ibaraki Prefecture: river sediments) (No.3)

			L					Rive	rsedi	ime nts	/Radio	oactiv	e Cesi	ium (C	Cs-134	i+c	s-137)	/Conce	ntratio	n(Bq/k	g)(*1)				T	Average of		Coefficient					
No.		Water area	ı	Location	Municipality	4	5	6	7	6	FY2	10	11	12	1	2	3	4	5	6	7		FY20	10		12 1	1.2	3	Changes	FY2016 (※2)	No.	of variation	Trends(*3)
1					4	160	0	/	36	9	10	67	12	1	83	3	4	230	0		231	9	10	29	12 1	31	3	\	130	1	2.03	<u> </u>	
2			1		96			88			87	_		43			81			58			19		56	-	14	61	2	0.96	~		
2			Kitaibaraki City		45	_		52			44	_		41			28			34			26	_	20	-	Vinn	20	2	0.76	~		
-	Toos Di	une Canatana	Hanazono River	Learner Delder	+		20			12			24			41			20			21		_	16		01		\~~	45	4	0.00	~
4	Taga Ko	ver System		School Deldes	Table to a life to		20			12			.0	_		41			33	25	-	21		-	10	_	21	+		45	4	2.40	~
3			Okita River	Sakae bridge	Takanagi City		07	_		0			0			19				55		70		_	19		31	-	\	24	5	3.49	~
6				Sakai Bridge	Kitaibaraki City		81			54			49			52				38		70		-	»/		35		<u></u>	50	0	2.25	~
7			Hananuki River	Shinhananuki Bridge	Takahagi City		101			86			88			75				41	_	61			13	_	43	_	\	47	7	0.95	>
8	Kujigawa I	River System	Kujigawa River	Yamagata	Hitachiomiya City Hitachi City/Takai		20			15			18			18			28				0	-	33		13		L	19	8	2.64	>
9				Sakaki Bridge	Village		23			15			63			42			24			0		-	28		34		m	22	9	1.25	>
10				Noguchi	Hitachiomiya City/Shirosato Town		0			13			14			11			22				10		0		0		V	8.0	10	1.59	\searrow
11		Nakagawa	Nakagawa River	Shimokunii	Mito City		33			31			91			12			111				114		57		57			85	11	3.25	>
12		River Area		Katsuta Bridge	Mito City/Hitachinaka City		116			17			16			12			447			296			31		101		Lon	219	12	2.05	>
13	Nakaanna		Nakamaru River	Yanagisawa Bridge	Hitachinaka City		540			580			660			308			362			369		2	50		53		han	259	13	1.02	\searrow
14	River		Hinumamae River	Nagaoka Bridge			88			37			62			51			66				24		20		31		M	35	14	0.96	1
15	System		Hinuma River	Takahashi	Ibaraki Town		17			13			0			12			21				12		0		0		~1_	8.3	15	1.97	\sim
16		Hinumagawa River Area	Kansei River	Kansei Bridge	1		25			118			35			25			50				37		31		31		~~~	37	16	0.66	\searrow
17			Daiya River	Oya Bridge	Hokota City		99			156			160			202			165				129	1	12		111		Mr.	129	17	0.82	
18			Hinuma River	Hinuma Bridge	Mito City/Oarai Town		298			179			169			56			139			89		1	24		151		Ann	126	18	0.77	<u> </u>
19			Hokota River	Asahi Bridge			147			118			113			89			106			160		1	43		128		11	134	19	0.58	<u> </u>
20			Tomoe River	Shintomoeeawa Bridee	Hokota City		57			67			73			106			54		-	44			16		61	-	MA .	51	20	0.85	~
21			Taiwo Piwer	Tazuka Bridae			69			140			166	_		75			62		-	61			70		69	-	1.	66	21	0.84	~
21			Tabada Dissa	Habilater sheeti Deldar			116			142			100			120			117			100			20		11/		\A	120	22	0.59	~
22		Kitaura River Area	I akeda River	Conjuku-onasni bruge	-		710			145			124			150						108		-	39	_	114	'	~~~	120	22	0.38	~
23			Yamada Kiver	Nioroshi Bridge	Namegata City		11			180			85	_		144			11		-	93				_	08	-	Vinn	/6	23	0.78	>
24			Kurakawa River	Kurakawa Bridge	-		131			202			141			197			100			51		_	/0		84	_	~~~	76	24	1.06	>
25			Gantsu River	JA Yokohashi Bridge				93		95			122			83			63			76			73		53		~~~	66	25	0.51	>
26			Nagare River	Suhoi Bridge	Kashima City		225			248			157			158			105			132		1	60	_	127		h	131	26	0.87	>
27			Sonobe River	Sonobeshin Bridge	Omitama City		132			146			90			97			178			61			74		105	i	_M	105	27	1.09	>
28			Sanno River	Tokoro Bridge	-		441			580			600			497			484			528		1	98		17		Mm	307	28	0.70	>
29			Koise River	Heiwa Bridge	Ishioka City		27			40			262			103			70			201		1	30		280	1	Am	170	29	1.07	>
30			Kajinashi River	Kamishuku Bridge	Namegata City		90			92			94			65			37			90			46		44		Vm	54	30	0.60	>
31			Hishiki River	Hishiki Bridge	Verumiaenen Citu		214			305			275			252			216			364		2	46		214		~~~~	260	31	0.59	\searrow
32			Ichinose River	Kawanaka Bridge	Rabumguuru City		409			367			416			495			454			217		2	34		365		m	318	32	0.63	~
33		Kasumigaura	Sakai River	Sakai Bridge/National Route 354			35			281			82			147			203				301	1	87		165		L	214	33	1.49	1
34		River Area	Shinkawa River	Shinten Bridge	Tsuchiura City		1,270			1,840			1,220			1,350			1,300				910	2	40		712		m	916	34	0.64	$\overline{}$
35			Sakura River	Eiri Bridge	Tsuchiura City/Tsukuba City		28			28			75			53			19			1	44		54		56		An	43	35	0.80	/
36	Tonegawa River		Bizen River	Bizengawa Bridge			1,760			830			1,830			2,160			1,900				1,410	1	370		1,40	0	1 mm	1,520	36	0.62	$\wedge \wedge \wedge$
37	System		Hanamuro River	Shinwa Bridge	Tsuchiura City		256			311			197			208			254				205	1	79		233		nr.	218	37	0.68	$\overline{\ }$
38			Seimei River	Katsuhashi Bridge	Ami Town		610			980			660			680			546				740	7	59		657		A.	676	38	0.92	
39			Onogawa River	Okuhara-ohashi Bridge	Ryugasaki City/Ushiku		371	\vdash	+	476			443			319			365		+	1	373	3	22	+	380	,	m	360	39	0.45	~~~*
40			Shintone River	Shintone Bridse	City Inashiki City			300		299			255			258			240			222			91		263		~~~~	229	40	0.35	~~~
41		Hitachitone®a	Yorokoshi River	Horinouchi Bridee				262	+	219		_	190	_		234		_	115	-	+	154		-	27	+	2.75	-	-Mr.	143	41	0,62	Λ٨Λ
42		wa River Aren	Maekawa Picar	Avame Bridge	Itako City		251		+	202			185	_		209			177	-	+	240	\vdash		37	+	120	-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	173	47	0.52	<u> </u>
42		nana Aird	a River	Komeshima P-14	Chilmeni Cim		1	\vdash	-	_04		_	.05	_		-07				-	+		$\left \cdot \right $		0	+	1.55	+	A.	.75	42	1.77	
45		Kinugawa	Kinugawa River	Kawashina Bridge	Chikuser City		0			102			10			20			10			0		_	0	_	0	-		0	43	1.77	/ V V *
44		River Area		Takishila Bridge	Moriya City		74			105			18	_		29			19		-		44	-	18	_	31	-	Vum	28	44	0.85	////*
45			Tagawa River	Tagawa Bridge	Chikusei City		26			0			26			22			18			13		_	14		15	_	5	15	45	2.59	>
46			Kokai River	Kuroko Bridge			128			150			132			103			121		_	106		1	33	_	115		m	119	46	0.71	
47		We had a source			79			60			34			32			28		_		32	-	32		30	_	V	31	47	1.10	>		
48		River Area	Yatagawa River	Maruyama Bridge	-		200	\square		158			103			107			154		-	1	118	4	47	+	102	-	/v.	205	48	1.04	>
49			Nishiyata River	Sakaimatsu Bridge	Tsukuba City		206			237			275			82			142			1	67	1	13		95		\sim	104	49	0.94	
50			Inari River	Oguki Bridge			370			486			368			464			354			1	346	3	83		395	·	~~	371	50	0.65	\searrow
51				Kurihashi Bridge	Koga City		50			72			43			79			21			67			17		114		L	55	51	2.44	>
52		Tonegawa River Area	Tonegawa River	Fukawa	Tone Town		123			134			14			26			28				182		34		20		him	66	52	1.10	
53				Sawara	Inashiki City		14		J	26			13			37			17			26			37		21		L	25	53	1.76	
						*1: Bla	nk cel	ls are lo	cations	wher	e sam	oles w	ere not	collec	ted. Th	e resul	lt "Not	detect	table" i	is indi	icated a	ıs "0."			A	вс	D	Е		166	Average		
						*2: Ari	thmeti	c Avera	ige; ca	kulate	d by a	ssumir	g ND=	=0; Col	or code	s shov	w cates	gories ((see th	e righ	ıt).			_									
1	- z Antanica Average, castaneo jo ssaning AL-24, Cost code sano caegore (see un right).																																
1						- 5: Kes	ults 0	i die affi	aiysis (n tren	as at fe	spect	ne IUCE	n OIS I	ising (D	e metr	iou exp	natine d	100.4.3	(1)2)			 Deci 	casing		nere	as mg		cachanged	· · · · · · · · · · · · · · · · · · ·			

5) Tochigi Prefecture

In Tochigi Prefecture, surveys were conducted 19 to 37 times from October 2011 to February 2017 at 56 locations (rivers) in public water areas (this analysis excludes the survey results from 49 locations where the survey was conducted only in 2011).

Regarding the concentration levels of detected values, one location was categorized into Category C, 10 locations were categorized into Category D and 45 locations were categorized into Category E (see Table 4.3-13 and Table 4.3-14).

Concentration levels were generally decreasing at 40 locations and fluctuating at 16 locations.

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	1	No. 39
D	Upper 25 to 50 percentile	10	No. 5, No. 6, No. 7, No. 8, No. 12, No. 21, No. 32, No. 34, No. 38, No. 51
Е	Lower than upper 25 to 50 percentile (lower 50%)	45	No. 1, No. 2, No. 3, No. 4, No. 9, No. 10, No. 11, No. 13, No. 14, No. 15, No. 16, No. 17, No. 18, No. 19, No. 20, No. 22, No. 23, No. 24, No. 25, No. 26, No. 27, No. 28, No. 29, No. 30, No. 31, No. 33, No. 35, No. 36, No. 37, No. 40, No. 41, No. 42, No. 43, No. 44, No. 45, No. 46, No. 47, No. 48, No. 49, No. 50, No. 52, No. 53, No. 54, No. 55, No. 56

Table 4.3-13 Categorizations of detected values at respective locations (Tochigi Prefecture: river sediments)





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-8 Changes in concentration levels over the years at respective locations

(Tochigi Prefecture: river sediments)

					(Tochig	ji Prefec	ctur	e:	rive	erse	edi	ime	ents	5) (No	.1)									
				Location	1					Riv	er sec	diments	/Radio	active	Cesiu	n (Cs-134+	Cs-13	57)/Concenti		Bq/kg	g)(*1)				
No.			Water area		Location	Municipality	8	9	10	11 1	2	1 2	3	4	5	6	7	8	9	10	11	12	1	2	3
1					Ikuyobashishita				90			96	5					42	93			19		15	
2				Nakagawa River	Komei Bridge	Nasushiobara City			250			97	7			139			78			43		64	
3				Takaomata River	Takaomata Bridge				650			1,25	90			89			162			221		197	
4				Yukawa River	Yukawa Bridge	Nasu Town			240			20	4			79			75			54		73	
5				Nakagawa River	Kamikuroiso	Nasushiobara City/Nasumachi			101			11	6			64 87		44 72	109			59		16	
6				Yosasa River	Yosasa Bridge				1,160			61	0			73			120			91		79	
7				Kurokawa River	Shinden Bridge	Nasu Town			64			50	0			175			105			194		128	
8				Yosasa River	Kawada Bridge				610			16	2			102 102		189 239	139			209		130	
9				Nakagawa River	Kurobane	1			57			83	3			40 35		54 34	102			53		58	
10				Matsuba River	Tributary	Otawara City			780			19	9			75 320		114 115	62			82		69	
11				Sabigawa River	Udagawa Bridge	1			32			66	0			34			270			234		183	
12				Momura River	Momuranaka Bridge	Ť			114			19	6			290			290			120		105	
13	Naka	ıgawa River	System		Yunohara				83			10	0					84	98			58		36	-
14					Sekiba Bridge	Nasushiobara City			126			10	1			76			81			82		193	
15				Hokigawa River	Iwai Bridge				16		+	50)	1	1	66			79			62	\neg	93	-
16					Hokigawa Bridge	Otawara City			165			89	,			30 72		54 34	52			52		53	
17				Nakagawa River	Shinnaka Bridge				40			14	1			51 31		30 107	38			56		16	-
18				Mumogawa River	Kosei Bridge	Nakagawa Town			28			26	5			12 12	14	14	34			43		30	
19					Saikachi Bridge	Shiova Town			198			30	0			300			1.020			102		168	
20				Arakawa River	Renio Bridge	Sakura City			0			33	3			32			44			15		33	
21					Tanaka Bridge	Vaita City			1.440			13	0			78			127			122		143	
22				Uchikawa River	Asahi Bridge	Sakura City			18			7	,			82			114			101		82	
23				Arakawa River	Mukada Bridge	,			90			74	0			11 12	49	30	84			75	-	99	
24				Eganya Divar	Tributary	Nasu Karasuyama City			162			13	0			58 85	52	51	58			66	-	63	—
24				Egawa Rivei	Kawaji Daiichi Power				102			15				50 05	52	36	75			10	_	45	
25				Vunichi Divar	Station, front	+			25				, 					10	0			17			
20				Oilee Diree	Tabutan	-			2.5			21	,					26	19			16		15	
27				Ujika Kivei	V	+			51			52	-					900	790			10		15	
20				Killugawa Kivel	Rosagoe	Nikha Citu	-		4000			20	, 0			120		146	112	01	01	96		390	
29				Itaana River	Tributary	NIKKO CITY			4,900			29	0			120		146	113	91	91	80		70	
30				Yukawa River	Tributary	+			118			10	2			50		63	00			114		12	
31				Daiya River	Shinkyo Bridge	+			4/			12	3			58			3/			54	_	38	
32				Shidobuchi River	Sujichigai Bridge	ł			260		_	40				270			245		-	203		226	
33				Daiya River	Kaishin Bridge (Harigai)				13			45	5			45		24	69	15	0	57		13	
34		Kinugawa	River System	Kinugawa River	Sanuki	Shioya Town			20			17	7			11		29	109	18	12	74		42	
35				River	Nishi-Kinugawa Bridge Kinugawabashi	Utsunomiya City			1,520			2,25	90			126			65			45		360	
36				Kinugawa River	Bridge(Hoshakuji Temple)				28			0				10			24			20		14	
37					Daidoizumi Bridge	Mooka City			0			12	2			24			30			42		51	
38				Egawa River	Tributary	Shimotsuke City			175			55	0			137 214	56	62	58			49		88	
39				Akabori River	Nikko City Hall, front	Nikko City			510			80	0			450			1,780			500	-	450	
40	Fonegawa River				Kiw adajima				117			12	5			104			93			40	:	380	
41	System			Tagawa River	Ozobashi Bridge	Utsunomiya City			62			57	'			28 69	104	28	101			142	-	150	
42				Kamagawa River	Tsukushi Bridge				182			65	5			99			78			68	1	123	
43				Tagawa River	Meiji Bridge	Kaminokawa Town			10			10)		<u> </u>	122			101			18		29	
44					Yanabashi Bridge	Oyama City			360			22	3			86			128			73		69	
45				Kurokawa River	Kaijima Bridge	Kanuma City			109			93	3			11			46			30		0	
46					Onari Bridge	Mibu Town			56			38	3	1		75			32			15		0	
47			Omoi River	Oashi River	Akaishi Bridge	Kanuma City			10			14	Ļ			15			0			11		11	
48			Area	Koyabu River	Koyabu Bridge	Cny			940			86	0			42			65			56		65	
49				Omoi Pivar	Tamotsu Bridge	Tochigi City			30			66	6			12			79			10		0	
50		Watarase			Otome-ohashi Bridge	Oyama City			186			40)			154 34	106	27	191			46		0	
51		River Area	Uzuma River Area	Uzuma River	Uzuma Bridge	Tochigi City			95			0				82 135	89	89	34			52		56	
52					Watarasegawa River intake weir at Sori Power Station	Nikko City		L	63			34	L .			36	20	38	55	53		34		27	
53					Hajika Bridge	Ashihar C			26			48	3			34			80			36		46	
54			Watarase River Area	Watarase River	Nakabashi Bridge	Ashikaga City			71			30	0	1		37			22			12		53	
55					Watarase-ohashi Bridge	Tatebayashi City			128			30)	1		260			67			310	:	228	
56					Shinkai Bridge	Tochigi City			48			57	7	1	1	43 164	127	46	45			40		36	
					Total n	umber	1,491	Detectio	n 1,	253		•													
							*1: Blan	ik cells :	are loca	tions when	e sam	iples wer	e not co	llected.	The re:	sult "Not dete	ctable"	is indicated as	; "0."						

Table 4.3-14 Detection of radioactive cesium at respective locations

				T	0						Dime			D 4"	, (~		,	C- 1	27)/(?		- (D - A	-)(#1)						
				Loc ation							1	FY201	3	ments/	Kadio	active	esnu	n (Cs-	1347	•Cs-1	57)/Concent	ratior	n(Bq/k I	g)(*1 7Y201	4				
No.			Water area		Location	Municipality	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2 3
1				NI D'	Ikuyobashishita	N 111 (S		13			12			14			23				18		26			12			
2				Nakagawa River	Komei Bridge	Nasushiobara City		51			97			38			36			24			24			45			19
3				Takaomata River	Takaomata Bridge			133			76			79			116			52			20			25			191
4				Yukawa River	Yukawa Bridge	Nasu Town		95			73			50			43			62			49			25			43
5				Nakagawa River	Kamikuroiso	Nasushiobara		91	49	28	73	42		74			11			102	58	83	45	90		44			24
6				Yosasa River	Yosasa Bridge	City/Nasumachi		78			105			85			90			24			430			55			820
7				Kurokawa River	Shinden Bridge	Nasu Town			104		90			80			74			68			90			62			77
8				Yosasa River	Kawada Bridge			103	109	274	77	87		50			67			75	134	152	146	206		61			137
0				Nakagawa Piyar	Kurohana	-		50	61	42	31	16		33			10			26	38	63	23	31		10			25
10				Matauka Diana	T-ikutan	Otawara City		69	26	90	110	94		122			106	_		10	72	61	50	90		06	$ \square$		70
10				Maisuba Rivei		Olawara City		154	30	80	226	04		260			160	_		19	13	01	39	80	-	50		\vdash	15
11				Sabigawa River	Udagawa Bridge	-		134			330			300			102				00		212	110		0/		\vdash	40
12	Nak	agawa River	System	Momura River	Momuranaka Bridge			137	72		8/			107			143				83		16	110		106	-	<u> </u>	125
13					Yunohara	Nasushiobara City			72	56				42							12		16			11		\vdash	
14				Hokigawa River	Sekiba Bridge				111		64			67			88				60		410			75		<u> </u>	106
15					Iwai Bridge	Otawara City		55			53			51			19				14			204		12		\vdash	15
16					Hokigawa Bridge			17	21	46	18	11		36			25			11	17	22	15	24		11		<u> </u>	17
17				Nakagawa River	Shinnaka Bridge	Nakagawa Town		33	19	14	57	0		94			18			19	17	19	15	42		15			12
18				Mumogawa River	Kosei Bridge			31	22	20	19	16		14			15			16	11	18	0	20		16			15
19				Arakawa River	Saikachi Bridge	Shioya Town		191			176			217			201			65			355			125			126
20					Renjo Bridge	Sakura City		63			0			12			14			13			0			13			11
21				Labikawa Piyar	Tanaka Bridge	Yaita City		85			195			103			72			105			152			63			97
22				Cellikawa River	Asahi Bridge	Sakura City		94			100			72			68			54			279			19			33
23				Arakawa River	Mukada Bridge	Nasu Karasuyama		84	27	30	85	58		19			35			16	10	20	39	73		12			21
24				Egawa River	Tributary	City		45	18	84	24	20		480			440			21	520	36	28	255		20			18
25				Kinugawa River	Kawaji Daiichi Power Station front				38		33			71			17			21			13			17			13
26				Yunishi River	Maesawa Bridge	-			13		0			0			12			0			11			21			
27				Ojika River	Tributary	-			14		240			17			35			11			14			20			11
28				Kinugawa River	Kosagoe	-			35		59			47			23			66			73			118			36
29				Itaana River	Tributary	Nikko City			75 81	94	86	43		73						62	41	72	53	75		55			47
30				Yukawa River	Tributary	-			0		0			11			137			0			10			0			;
31				Daiya River	Shinkyo Bridge	_			75		21			33			15		_	12			20			17			20
32				Shidobuchi River	Suiichigai Bridge	-			212		182			123			162	_			189	-	150			108			67
22				Daine Binne	Suje ingai bilage	_			16 15	0	15	11		12.5			102	_			24 11	12	0	12		0	\square		0/
24				Vinuenue Diese	Canadai	Shino Tour			470 124	154	210		17	274			07	_			14 0	0	0	20		0	\square		10
34		Kinugawa	River System	Nishi-Kinugawa		Shioya Town		50	470 134	1.54	510		17	2/4			51	_			14 0	0	0	20	-	109		\vdash	19
35				River	Nishi-Kinugawa Bridge Kinugawabashi	Utsunomiya City		56			0			51			1,540				32		69			108	-	<u> </u>	18
30				Kinugawa River	Bridge(Hoshakuji Temple)			31			0			0			0				0		13			0	-	<u> </u>	0
31					Daidoizumi Bridge	Mooka City		0			10			- 11			0				22		95	-		45		\vdash	0
38				Egawa River	Tributary	Shimotsuke City		41	30	34	17	480		70			51			38	46	13	20	0		19		<u> </u>	11
39				Akabori River	Nikko City Hall, front	Nikko City			310		420			370			650			191			150			293		\vdash	117
40	Tonegawa River				Kiwadajima				187		78			61			69			48			41		I	26	<u> </u>		25
41	System			Tagawa River	Ozobashi Bridge	Utsunomiya City		64	23	18	13	36		17			35			20	12	27	12	13		14	 	<u> </u>	16
42				Kamagawa River	Tsukushi Bridge			133			27			50		\square	169			81			107			56			40
43				Tagawa River	Meiji Bridge	Kaminokawa Town		32			31			76			41			0			17			14			0
44					Yanabashi Bridge	Oyama City		66			43			104		\square	96			42			57			74			27
45				Kurokawa River	Kaijima Bridge	Kanuma City		19			0			15			0			10			14			0			0
46				narokawa navei	Onari Bridge	Mibu Town		13			0			0			17				0		0			0			0
47			Omoi River	Oashi River	Akaishi Bridge			0			0			0			0			0			0			18			0
48			Area	Koyabu River	Koyabu Bridge	Kanuma City		46			36			49			420			60			29			19			18
49					Tamotsu Bridge	Tochigi City			0		119			0		\square	0				0		0			0			0
50		Watarase		Omoi River	Otome-ohashi Bridge	Oyama City		62	13	15	101		53	0			0			15	43	65	540	0		0			0
51		River Area	Uzuma River	Uzuma River	Uzuma Bridge	Tochigi City		192	530	460	44	186		26		Ħ	50			195	0	115	82	69		157			116
52			Juca		Watarasegawa River intake	Nikko City		18	19	32	54		20	15			21	+		15	90	18	15	13		18			28
53					Hajika Bridge			59			28		⊢	16		$\left \right $	15			0			15			0	_		14
54			Watarase	Watarase River	Nakabashi Bridge	Ashikaga City	-	0			0			0		+	0				10		0			0			0
55			Kiver Area		Watarase-ohashi Bridge	Tatebayashi City		21		-	112			0		\vdash	160	\neg			0		59			12	$ \rightarrow$		0
56					Shinkai Bridge	Tochigi Citv		29	34	30	16	13		19		\vdash	22	\neg			17 11	77	16	24		-	18		11
		I	I	1		a)	*1. Br	nk cett	s are location	s when	e same	les we	e not -	collecter	l The	result "N	- lot det	ectable	" is in-	icated	as "0"				I				
1																													

Table 4.3-14 Detection of radioactive cesium at respective locations

(Tochigi Prefecture: river sediments) (No.2)

Table 4.3-14 Detection of radioactive cesium at respective locations (Tochigi Prefecture: river sediments) (No.3)

				Location								1	River se	edime	nts/Ra	dioacti	ve Cesia	um (Cs-1	134+	Cs-13	7)/Co	ncentr	ation(B	q/kg)(*1	,					4		0.00.00	
No			Watar area		Investiga	Municipality					1	FY20	15										FY20	16					Channa	Average of FY2016	No.	of	Trends(*3)
140.			water area		LOC ALOH	stunc ipany	4	5	6	7	8	9	10	11	12	1	2 3	4	5	6	7	8	9	10 11	12	1	2	3	Changes	(*2)		variation	
1				Nakagawa River	Ikuyobashishita	Nasushiobara City		11			15			0		:	21		14			0		13			18		Y	11	1	1.08	/
2					Komei Bridge			17			21			11			16		19			18		11			29		han	19	2	1.06	1
3				Takaomata River	Takaomata Bridge	New Terrs		47			82			31			41		12			44		44			26		1	32	3	1.73	\nearrow
4				Yukawa River	Yukawa Bridge	ivasu 10wii		30			15			17			64		24			32		27			19		L	26	4	0.89	\searrow
5				Nakagawa River	Kamikuroiso	Nasushiobara City/Nasumachi		47	131	32	59	66		24			29		11	30	30	71	77	57			135		WWWhy	59	5	0.53	~~~*
6				Yosasa River	Yosasa Bridge			19			17			19			17		39			0		15			19		h /	52	6	1.62	$\wedge \wedge \wedge$
7				Kurokawa River	Shinden Bridge	Nasu Town		75			60			35			30		75			44		85			57		٨.	65	7	0.94	/
8				Yosasa River	Kawada Bridge			36	54	123	82	68		71			80		104	21	73	36	138	10			88		1	81	8	0.80	\sim
0				Nakamawa Pinar	Kurohana	-		23	15	18	21	20		23	-		19		17	19	32	16	36	24			15		Maria	23	0	0.56	<u>^</u>
7				ivakagawa Kivei	Killobalie			20	15	10	21	27		20	-		1.7		17	19	32	10	50	24		_	15	_	" min	25	,	0.50	/
10				Matsuba River	Tributary	Otawara City		30	24	165	29	40		30	_	-	27		40	30	27	29	80	21		_	42		V	40	10	1.36	1
11				Sabigawa River	Udagawa Bridge	-		14			30			23		-	24		26			10		25			67		~~	33	11	1.16	>
12	Naka	igawa River	System	Momura River	Momuranaka Bridge			21			35			82		_	77		71			64		43			31		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	52	12	0.64	>
13					Yunohara	Nasushiobara City			0		32			24		1	32		0			14		0			0		Non	3.5	13	0.88	/
14				Hokigawa River	Sekiba Bridge	-		74			49			39		1	34		21			25		25			15		-h-	23	14	0.94	\sim
15					Iwai Bridge	Olumon City		18			23			13			17		16			13		12			17		$\sim h_{\sim}$	15	15	1.05	$\wedge \wedge \wedge$
16					Hokigawa Bridge	Olawan Cay		0	13	45	12	10		13			14		0	0	0	11	14	14			15		burn	7.7	16	1.09	\searrow
17				Nakagawa River	Shinnaka Bridge			12	15	16	13	11		12			10		10	0	10	0	27	0			0		when	6.7	17	0.99	1
18				Mumogawa River	Kosei Bridge	Nakagawa Town		13	0	17	0	14		14			12		0	0	0	14	14	0			24		Nord	7.4	18	0.67	/
19					Saikachi Bridge	Shioya Town		71			55			14			26		40			22		24			22		A	27	19	1.23	<u> </u>
20				Arakawa River	- Renio Bridge	Sakura City		0			17	+		0		+	0		0			14		0			13	-	~~	6.8	20	1.13	×.
20					Tanaha Baidan	Naite City		50			22	1		26			42	+	54		-	·** 20	-+	24	+		150	-	(*h~~~	72	20	1.01	1
21				Uchikawa River	i anaka isridge	rana City		39			32			20	_	-	45					39		32		_	139		L	72	21	1.91	>
22					Asahi Bridge	Sakura City		35			38			29		-	32		40			30		30			29		\sim	32	22	0.85	////*
23				Arakawa River	Mukada Bridge	Nasu Karasuyama		0	15	12	12	12		11		_	0		15	16	19	13	11	10			11		٨	13.6	23	2.37	1
24				Egawa River	Tributary	City		14	16	12	21	0		12		1	05		78	24	16	68	0	21			16		M	32	24	1.53	\sim
25				Kinugawa River	Kawaji Daiichi Power Station, front			18			0			24			16		28			35		10			25		Man	25	25	0.66	\nearrow
26				Yunishi River	Maesawa Bridge			0			14			0			13		0			0		0			0		\mm_	0	26	1.31	$\wedge \wedge \wedge$
27				Ojika River	Tributary			0			21			0			0		0			0		0			0		-	0	27	2.04	$\sim \sim$
28				Kinugawa River	Kosagoe	1		33			95			14			16		16			44		25			17		Λ	27	28	1.73	$\wedge \wedge \wedge$
29				Itaana River	Tributary	Nikko City		62	63	41	34	23		25		1	16		27	20	54	23	18	21			27		1	27	29	3.95	
30				Yukawa River	Tributary	-			0		0			17			0		10			0		0			0		11	2.5	30	1.51	<u>``</u>
21				Daine Binne	Chinham Daidan		_	14			15				-	-	12		15			19		15		_	10	_		15	21	0.99	~
31				Daiya Kivei	Simikyo in tige	-		14			15					-			10			10		1.		_	10		~	15	31	0.54	/
32				Shidobuchi River	Sujichigai Bridge	-		95			81			146			00		/8			111		64			44		~~~	/4	32	0.54	>
33				Daiya River	Kaishin Bridge (Harigai)			19	11	18	15	11		0		-	20		16	18	0	16	0	0			0		Anne	7.1	33	1.03	1
34		Kinugawa	River System	Kinugawa River	Sanuki	Shioya Town		13	0	25	12	0		17			19		26	18	34	12	15	11	'		137		~M	51	34	1.54	$\sim \sim$
35		-		Nishi-Kinugawa River	Nishi-Kinugawa Bridge	Litsunomiya City		14			25			196		1	49		50			14		0			27		L.A.	23	35	2.03	/
36				Kinuaawa Pisar	Kinugawabashi Bridge(Hoshakuji Temple)				0		0			12			15		0			0		0			0		Mrr	0	36	1.37	$\wedge \wedge \wedge$
37				Killugawa Kivel	Daidoizumi Bridge	Mooka City			0		0			11			13		32			19		0			0		~~~	13	37	1.24	$\wedge \wedge \wedge$
38				Egawa River	Tributary	Shimotsuke City		21	45	18	40	31		40			17		200	57	20	234	82	0			16		Ala	87	38	1.45	Į
39					Nikko City Hall, front	1		1,010			262	1		72			64		49			219		19	;		245		An	177	39	0.94	\searrow
40	Tonegawa			Akabori River	Kiwadajima	Nikko City		23		1	29	1		102			20		34		1	27		18			27			27	40	1.06	1
41	River System			Tagawa River	Ozobashi Bridge			10	14	14	12	0		11		-	11		0	12	0	0	0	0			0		-1	1.7	41	1.24	<u> </u>
42				Kamagages Disc-	Tsukushi Briden	Utsunomiya City		35			25	-		14		-	18		48	-	t -	58	-	1	+		18		hah	36	42	0.71	^
42				gatra kurd	Maii Bridaa	Kaminokawa		0			0	1		0		+	10					102	-+		+		0	_	A	28	42	1.20	<u>~</u>
43				Tagawa River	saciji izluge	Town		0			0	-	+	12	_	+	17		0			105	-	10	+		10	_	1	20	45	1.50	/ ٧ ٧ •
44					r anabashi Bridge	Oyama City		51		-	63	-		12	-+	-	22	+	24		-	24	-+	24	+		15	_	~~~	22	44	1.03	1
45				Kurokawa River	Kaŋıma Bridge	Kanuma City		0		-	0	-	+	0		_	U		0		-	0		47	+		0	_	<u>~~</u> ^	12	45	1.71	>
46					Onari Bridge	Mibu Town		0		L	0			0			0		0			0		10			38		×∽	12	46	1.59	>
47			Omoi River	Oashi River	Akaishi Bridge	Kanuma Citv		0			0			10			0		0			53		0			0		~~~~~^	13	47	1.88	\sim
48			Area	Koyabu River	Koyabu Bridge			19			13			14			13		33			20		0			0		\Box	13	48	2.06	>
49				Omni Bir	Tamotsu Bridge	Tochigi City		0			0			0		T	0		0			0		0			0		M_	0	49	2.22	\sim
50		Watarase		Ganoi Kiver	Otome-ohashi Bridge	Oyama City		19	0	14	0	0		0			0		0	36	0	10	82	0			0		mul.	18.3	50	1.95	\sim
51		River Area	Uzuma River Area	Uzuma River	Uzuma Bridge	Tochigi City			163 195	0	0	67		98			13		0	0	15	116	88	75			97		Aw	56	51	1.10	NVV.
52					Watarasegawa River intake	Nikko City		11	13	13	23	23		15	\neg	+	0		25	14	0	10	0	0			0		willing .	7.0	52	0.81	-
53					wen at Sori Power Station Hajika Bridge				0		0	1		0	+	+	21		0			11	+	0	+		15		M	6.5	53	1.04	<u> </u>
54			Watarase	Wataraca Pine-	Nakabuchi Bridee	Ashikaga City			0		0	+		0			0		-					0	+	_	0	_	1	2.8	54	2.76	~
			River Area	** anarase Kiver	r sasatoasin in nge	m	\vdash		205	-	0	-		10		_	~		0		-	-11		0	+		0	_	M . A	2.0	.4	1.20	
22					waarase-onasni Bridge	ateoayashi City	\vdash		295	6	14		+	10	-+	+	~	+	U		1.	/0		0	+	_	U	_	VWML	18	55	1.29	////
56			I		Shinkai Bridge	I ochigi City			0 12	0	0	42		0			1/		0	0	11	135	0	16			0		-K-hall	23	56	1.20	>
							*1: Bł	ank cel	ls are location	ns whe	ere san	nples v	were not	collect	ed. The	result	"Not dete	ectable" i	s indic	ated as	s "0."			A	В	С	D	Е		28	Average		
							*2: Ar	rithmeti	c Average; c	akulat	ted by	assum	ning ND=	0; Col	or codes	s show	categorie	s (see the	e right).													
							3: Re	esults o	f the analysis	of tre	nds at	respec	ctive loca	tions u	ising the	metho	d explain	ed on 4.3	(1)2)	$\overline{}$	De	creasin		➤ Increase	asing	~~	Unch	anged	A Fluctu	ations			

6) Gunma Prefecture

D

Е

Upper 25 to 50 percentile

Lower than upper 25 to 50 percentile

(lower 50%)

7

40

In Gunma Prefecture, surveys were conducted 12 to 37 times from November 2011 to January 2017 at 48 locations (rivers) in public water areas (this analysis excludes the survey results from eight locations where the survey was conducted only in 2011).

Regarding the concentration levels of detected values, one location was categorized into Category B, seven locations into Category D, and 40 locations into Category E (see Table 4.3-15 and Table 4.3-16).

Concentration levels were generally decreasing at 32 locations, were unchanged at one location and fluctuating at 15 locations.

		(Gunn	na Prefecture: river sediments)
Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	1	No. 47
С	Upper 10 to 25 percentile	0	(None)

No. 43, No. 44, No. 46

No. 1, No. 4, No. 22, No. 27, No. 39, No. 45, No. 48

No. 2, No. 3, No. 5, No. 6, No. 7, No. 8, No. 9, No. 10, No. 11, No. 12, No. 13, No. 14, No. 15,

No. 16, No. 17, No. 18, No. 19, No. 20, No. 21, No. 23, No. 24, No. 25, No. 26, No. 28, No. 29,

No. 30, No. 31, No. 32, No. 33, No. 34, No. 35, No. 36, No. 37, No. 38, No. 40, No. 41, No. 42,

Table 4.3-15 Categorizations of detected values at respective locations

	Changes in concentration levels in river sediments by location (locations in Category B or D in Gunma Prefecture)		0	Changes (1	in concentration locations in Cate	n levels in 1 gory E in (river sedim Gunma Pro	ents by loc efecture)	ation	
2,500 (\$2,000 (\$2,000 (\$1,500 (\$1,500)	(locations in Category B or D in Gunma Prefecture)	No. 1 No. 4 No. 22 No. 27 No. 39 No. 45 No. 47	- 000 - 0 -						No. 2 No. 5 No. 7 No. 9 No. 13 No. 15 No. 17 No. 19 No. 20 No. 21 No. 24 No. 26	
Badioactive Control Co		No. 48 Month	- 000 - 001 - 000	1 1 3 5 7 Y2011 F		3 5 7 9 11 1 3 FY2014	5 7 9 11 1 3 FY2015	5 7 9 11 1 3 FX2016	- No. 29 - No. 31 - No. 33 - No. 35 - No. 37 - No. 40 - No. 42 - No. 44 Month	No. 30 No. 32 No. 34 No. 34 No. 38 No. 41 No. 43 No. 46



2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-9 Changes in concentration levels over the years at respective locations

(Gunma Prefecture: river sediments)

			Loc	ation					I	Rivers	sedim	ents/R	adioa	ctive	Cesiu	n (Cs-	134+	Cs-13	7)/Co	ncentr	ation(B	q/kg)(*1				
No.		Water a	rea	Location	Municipality				FY2	011		1				1		1		FY2	012					
		1				8	9	10	11	12	1	2	3	4	5	6	7	8	3	9	10	11	12	1	2	3
1			Tonegawa River	Hirose Bridge					77						350					74		90				
2				Tsukiyono Bridge	Minakami Town				71			87			102		37	55	54	60		68		71		
3			Akaya River	Kosode Bridge					24				92		68					42		40		113		
4			Sakura River	In Ooaza Yachi	Kawaba Village					173		330			410		244	227	500	279		259		271		
5				Kirinoki Bridge	Katashina Village					38			63		38					159		31				
6			Katashina River	Tonemachitakatoya	Newsetz City					10			15		0		10	0	15	0		0				
7				Futae Bridge	Numata City				30			51			39		86	96	154	47		74		126		
8		Tonegawa	Agatsuma River	Shinto Bridge	Naganohara Town					0		24			11			18	37			95		0		
9		River Area	Shirasuna River	Shuttatsu Bridge	Nakanojo Town					12										12						
10			Agatsuma River	Downstream of Azuma Bridge	Higashi-Agatsuma Town					0		0			11		22	0	14	14		10		0		
11			Nakuta River	Tonoda Bridge	Takayama Village					215		73				133				81		85		83		
12			Agatsuma River	Agatsuma Bridge						153		33			53	19	37	170	610			0		11		
13			Tonegawa River	Taisho Bridge	Shibukawa City					39		34			31	49	15	56	69			30		50		
14			Takizawa River	Shintakizawa Bridge	Shibukawa					206		97				80				50		48		245		
15				Gunma abashi Pridga	City/Yoshioka Town					55		410				60						40	27	52		
1.5			Tonegawa River		m m					112		410				44				42		-	37	20		
16				Fukushima Bridge	Tamamura Town					112		23				44				43		_	46	39		
17			Nagai River	Kamigonda Bridge	Takasaki City					126			160			310				107			247	170		
18			Karasu River	Karasugawa Bridge						77			88			52				51			45	39		
19			Usui River	Nakase Bridge	Annaka City					106		94				370				120			95	63		
20				Hanataka Bridge	Takasaki City					38		78				74				82			40	61		
21			Kabura Divar	Tadakawa Bridge	Shimonita Town					17		11				56				29			15	17		
22			Rabura River	Kaburagawa Bridge	Takasaki City/Fujioka City					0		69				42				38			91	73		
23			Ogawa River	Kinzan Bridge	Kanra Town											87				90			36	13		
24	Tonegawa	Karasu River Area	Nanmoku River	Ozawa Bridge	Nanmoku Village											68				10			18	0		
25	River System		Someya River	Yakushi Bridge	Shinto Village					142		73				113				133			67	53		
26			Inogawa River	Kamakura Bridge	Takasaki City					68		0				125				12			11	0		
27			Karasu River	Iwakura Bridge	Takasaki Citu Tanana Tanan					67		19				101				720			310	380		
28			Kanna River	Shinkaname Bridge	Ueno Village											37				0			16	0		
29			Kanna River	Morito Bridge	Kanna Town					0		0				0				0			0	0		
30			Kanna Piyer	Tobukyo Bridge	Fujioka City/Kamikawa					0		0				0				0			13	0		
21			Kanna River	Vouno prideo	Town					0		0				14				0			45	107		
31			Kanna Kiver	Rannagawa bridge	Kamisato Town					0		0				14				0			30	107		
32			I onegawa River Akagishirakawa	Bando-onasni Bridge	Honjo City					22		46				93				0			252	1/		
33			River	In Shimohosoi Town						108		15				40				78			61	41		
34			Momonoki River	Utsuboi Bridge	Maebashi City					27		15				75				14			41	0		
35		T	Arato River	Okuhara Bridge						0		48								13			0	0		
36		River Area	Kasukawa River	Hozumi Bridge						46		46				39				18			31	16		
37			Hirose River	Nakajima Bridge	Isesaki City					15		17				68				41			0	35		
38			Havakawa River	Hayakawa Bridge						370						147							261			
39			rayaaan a raver	Maejima Bridge	Ota City					99						183							77			
40			Tonegawa River	Tone-ozeki Weir	Chiyoda Town /Gyoda City					235		203			410		340	28	80		640 3	80	72	83		
41			Koguro River	Kayano Bridge	Kiryu City					340			158		103		136	19	98		228 1	20	187		139	
42				Takatsudo	Midori City					86		50				60				56			84		64	
43			Watarase River	Intake for Akaiwayosui	Kiryu City					98		96			82		69	6	6		74 8	30	76		81	
44		Watarase	Tatara River	Ejiri Bridge	Oura Town								-			630							164	197	-	
45		River Area		Kannon Bridge	Kirvu Citv					110			104			240				128			100		235	
10			Kiryu River	Sakai Bridae	Kiryu City/Ashikaga					100		155	.04		122	240	242	14	10	.20	05 1	18	105		104	
47			Taumuda Di	Laka Jonum-	City Tatabayashi City					190		133			122	1.000	243	14			75 I	10	103	1.41	104	
4/			Vota annu D'	Lake Jonuma	Meiwa Town/Itakura											1,080							1,500	141		
48			1 atagawa Kiver	i ogoda Bridge	Town	Total n	umber		Dete	ction						040							0	490		
						of sar	mples	1,142	tim	ies	911	l														
						*1: Blan	ik cells	are loc:	ations v	vhere s	amples	were	not col	lected.	The re:	sult "N	ot deteo	table"	is indi	ated as	"0."					

Table 4.3-16 Detection of radioactive cesium at respective locations

(Gunma Prefecture: river sediments) (No.1)

Table 4.3-16 Detection of radioactive cesium at respective locations (Gunma Prefecture: river sediments) (No.2)

			Loc	ation						Riv	verse	dimen	ts/Rad	lioacti	ive Ce	sium ((Cs-13	4+C	s-137)/Conc	entra	tion(B	q/kg)(*1)						-	
No		Water a	пеа	Location	Municipality					F	Y201	3											FY2014						
			1			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1			Tonegawa River	Hirose Bridge				72		194			52		61					42		34			83				
2				Tsukiyono Bridge	Minakami Town			70 46	47	115	40		60		36					33 55	25	50	23		38		51		
3			Akaya River	Kosode Bridge				39		60			13		90					16		17			19		24		
4			Sakura River	In Ooaza Yachi	Kawaba Village			282 260	263	222	126		129		147				135	169	179	132	185		141				
5				Kirinoki Bridge	Katashina Village			46		17			17		34				15			13			17				
6			Katashina River	Tonemachitakatoya				10 10	0	0	0		0		0				42	0	0	0	0		0				
7				Futae Bridge	Numata City			99 80	95	74	92		39		34				54	110	53	89	85		30		36	-	
			Anntonen Diver	Chinese Deiden	Neeenshara Taura					0	/2		0		0				5.	29	55	27			0		10	-	
0		Tonegawa River Area	Agaisuma Kivei		Naganonara Town			0		0			0		0					38		21			0		10		
9			Shirasuna River	Downstream of Azuma	Nakanojo 10wn Higashi-Agatsuma			0		12			0		0					10		0			0		0	-	
10			Agatsuma River	Bridge	Town		0	0	0	12	0		0		0				0	0	0	0	11		0		0		
11			Nakuta River	Tonoda Bridge	Takayama Village			68		93			60		38					19		15			17		21	_	
12			Agatsuma River	Agatsuma Bridge	Shibukawa City		16	34	95	51	56		46		10				0	26	11	11	0		13		17		
13			Tonegawa River	Taisho Bridge			46	54	65	147	16		15		20				25	20	14	12	15		35		53	$ \bot $	
14			Takizawa River	Shintakizawa Bridge	Shibukawa City/Yoshioka Town			65		48			24		39				23			15			24		22		
15			Tonegawa Diva-	Gunma-ohashi Bridge	Maebashi City			73		140			12		43				93			52			50		80		
16			i onegawa Kiver	Fukushima Bridge	Tamamura Town			64		56			0		0				57			0			85		16		
17			Nagai River	Kamigonda Bridge				186		176			137		52				84			42			31		51		
18			Karasu River	Karasugawa Bridge	Takasaki City			41		30			19		19					26		13			11		35		
19				Nakase Bridge	Annaka City			127		57			19		131					17		27			26		22	-	
20			Usui River	Hanataka Bridge	Takasaki City			47		68			12		0				0			0			13		0	-	
21				Tadakawa Bridge	Shimonita Town		0			13			0		0				17			12			0		0	-	
22			Kabura River	Vahananan Paidan	Takasaki City/Fujioka		214			40			50		22				24			22			27		42	-	
22			0	Kaburagawa Bi kige	City		214			49			50		22				24	12		25			27		45	-	
23	_	Karasu	Ogawa River	Kinzan Bridge	Kanra Town		15			16			63		30					15		3/			18		18	-	
24	Tonegawa River	River Area	Nanmoku River	Ozawa Bridge	Nanmoku Village		13			21			0		11				0			13			0		0		
25	System		Someya River	Yakushi Bridge	Shinto Village			47		67			24		35				23			20			20		17		
26			Inogawa River	Kamakura Bridge	Takasaki City			23		19			23		39				46			10			12		14		
27			Karasu River	Iwakura Bridge	Takasaki City/Tamamura Town		302			950			122		16				29				362	1	296		192		
28			Kanna River	Shinkaname Bridge	Ueno Village		16						0						17						0				
29			Kanna River	Morito Bridge	Kanna Town		0						0						13						0				
30			Kanna River	Tobukyo Bridge	Fujioka City/Kamikawa Town		0						0						0						0				
31			Kanna River	Kannagawa Bridge	Kamisato Town			36					42						16						0				
32			Tonegawa River	Bando-ohashi Bridge	Honjo City		224			237			66		53				33				79		11		39		
33			Akagishirakawa River	In Shimohosoi Town				63		17			18		13				25			47			15		10		
34			Momonoki River	Utsuboi Bridge	Maebashi City			0		16			0		13				19			16			17		15	\neg	
35			Arato River	Okuhara Bridge				0		0			26		10				10			0			10		0	+	-
36		Tonegawa	Kasukawa River	Hozumi Bridge			31		1	286			15		29				28			413			11		13	+	
37		River Area	Hirose River	Nakajima Bridge	Isesaki City		0		-	83			57		45				19			32			17		18	+	
38				Havakawa Bridee			173		+	82			25		95				270				45	\vdash	51		73	+	
20			Hayakawa River	Maaiima Dai bu	Ota Citu		1/3		+	160	\vdash		43		7J				150			50		\vdash	01		13	+	
39				maejima Bridge	Chiyoda Town /Gyoda		70	26		109	100		07		30				150	45		20	180 105		91		44		
40			1 onegawa River	1 one-ozeki Weir	City		59	/5	50	95	400		1/2		28				23	45	181		178 105		116		158	+	_
41			Koguro River	Kayano Bridge	Kiryu City		330	143	157	113	48		90		87					102 72	41	26	61		56		57	\rightarrow	
42			Watarase River	Takatsudo	Midori City		65		-	61			36		89					60		23			45		27	\rightarrow	
43				water channel	Kiryu City		78	65	90	78	62		53		52					35 35	20	46	46		49		47	\downarrow	
44		Watarase River	Tatara River	Ejiri Bridge	Oura Town		104			360			126		26					640		610			101		64	$ \bot $	
45		Area	Kirvu River	Kannon Bridge	Kiryu City		131			110			94		107					164		43			25		27		
46			.,	Sakai Bridge	Kiryu City/Ashikaga City		76			135			152		88					14		12			22		26		
47			Tsuruuda River	Tatebayashi City		470			510			1,560		92					760		2,160		1	1,360		1,440			
48			Yatagawa River	Togoda Bridge	Meiwa Town/Itakura Town		124			52			550		28					320	_	22		\Box	40		48		
						*1: Bk	unk cel	ls are locati	ons whe	re sam	ples w	ere not	collec	ted. Th	e resu	ilt "Not	detect	table" i	s indic	ated as "0."									

			Lo	ation		r																						1	r	
											FY2015										FY	2016				<i>C</i>	Average of FY2016	No.	Coefficient of	Trends(*3)
NO.		water a	rea	Location	Municipaity	4	5	6	7	8	9	10	11	12	1 2	3	4	5	6	7	8 9	10 1	12	1	2	3 Changes	(*2)		variation	
1			Tonegawa River	Hirose Bridge				154		38			84	1	307			76			36	6				M	58	1	0.87	\sim
2			B	Tsukiyono Bridge	Minakami Town		27	15	18	18	15		19		22			21	22	12	21 17	30	•	23		The	21	2	0.60	/
3			Akaya River	Kosode Bridge	1		25			11			13		13			28			24	13		13		MM_	20	3	0.82	Ĺ
4			Sakura River	In Ooaza Yachi	Kawaba Village		150	231	273	100	85		144		128			138	138	98	113 74	10	D	94		1	108	4	0.49	1
5				Kirinoki Bridge	Katashina Village		18			15			14		17			15			25	0		0		An	10	5	1.15	\checkmark
6			Katashina River	Tonemachitakatoya			21	47	58	10	0		0		0			11	0	11	0 0	0		0		M-11	3.1	6	1.84	$\wedge \wedge$
7				Futae Bridge	Numata City		53	31	161	59	19		18		24			14	15	14	21 32	1		21		Mand	19	7	0.67	
8		_	Agatsuma River	Shinto Bridge	Naganohara Town		0			10			0		20			0			0	0		0		Δ	~ 0	8	2.26	
9		Tonegawa River Area	Shirasuna River	Shuttatsu Bridge	Nakanojo Town		0			0			0		19			0			0			0			0	9	1.72	
10			Anotone Dine	Downstream of Azuma	Higashi-Agatsuma		0	0	0	0	0		0					0	0	0	0 0			0	_	- VV_	0	10	2.20	/vv•
10			Agaisunia Rivei	Bridge	Town		10	0	0	17	0		0		0			0	0	0	0 0			0		///L/	0	10	2.20	/
			Nakuta River	I onoda Bridge	i akayama viilage		19			17			20		25			15			1/	1.		22			18	11	0.95	/
12			Agatsuma River	Agatsuma Bridge	Shibukawa City		0	0	0	0	12		0		0			0	0	0	103 18	0	_	13		-An-	. 19	12	2.38	
13			Tonegawa River	Taisho Bridge			12	11	15	14	0		12		16			26	15	27	13 14	13		0		mhr	~ 15	13	0.90	1004
14			Takizawa River	Shintakizawa Bridge	Snibukawa City/Yoshioka Town		42			20			18		42			16			14	0		16		~~~	12	14	1.16	>
15			Tonegawa River	Gunma-ohashi Bridge	Maebashi City		69			286			0		14			17			81	90	1	0		han	47	15	1.23	
16			B	Fukushima Bridge	Tamamura Town		37			11			0		35			0			36	0		0		-wh	9.0	16	0.96	\sim
17			Nagai River	Kamigonda Bridge	Tekezeki Citu		55			91			28		31			45			21	19		15		M	25	17	0.82	/
18			Karasu River	Karasugawa Bridge	i akasaki City		22			23			11		0			0			27	10		14		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	14	18	0.75	1
19				Nakase Bridge	Annaka City		20			42			14		13			90			27	14		26		A.,	39	19	1.14	Ĺ
20			Usui River	Hanataka Bridge	Takasaki City		13			15			0		12			0			0	19		0		m	4.8	20	1.13	/
21				Tadakawa Bridge	Shimonita Town		0			0			0		0			0			0	0		0		Λ	0	21	1.61	$\overline{)}$
22			Kabura River	Kaburagawa Bridge	Takasaki City/Fujioka		0			123			17		0			183			12	12	7	0			81	22	1.06	
23			Ocawa Rivar	Kinzan Bridae	City Kanra Town		10			11			23		13			15			18			0		1.	83	23	0.97	····
~		Karasu	Number Die	Common De la common de la common de la common de la common de la common de la common de la common de la common	Name Town		0						0		0			0			.0			0		1		20	2.06	~
24	River	River Area	Nanmoku River	Ozawa Bridge	Nanmoku village		0			0			0		0			0			0	0		0		n-	0	24	2.00	~
25	System		Someya River	Yakushi Bridge	Shinto Village		23			19			29		21			16			19	1		12			15	25	0.88	~
26			Inogawa River	Kamakura Bridge	Takasaki City Takasaki		0			11			0		0			22			16	10		0		Non	14	26	1.35	
27			Karasu River	Iwakura Bridge	City/Tamamura Town			60		164			48		0			0			96	20	0	104		,M~	100	27	1.16	/VV¥
28			Kanna River	Shinkaname Bridge	Ueno Village		0						0					0				0				m_	0	28	1.66	~
29			Kanna River	Morito Bridge	Kanna Town		0						0					0				0					0	29	3.74	\sim
30			Kanna River	Tobukyo Bridge	Fujioka City/Kamikawa Town			14					0					0				0					0	30	2.90	\mathbb{N}
31			Kanna River	Kannagawa Bridge	Kamisato Town			65					0					0				0				A	0	31	1.42	\sim
32			Tonegawa River	Bando-ohashi Bridge	Honjo City			16		192			23		10			14			12	13		0		Mus	11	32	1.23	\sim
33			Akagishirakawa River	In Shimohosoi Town			20			11			0		32			29			28	13		12		m	21	33	0.83	\checkmark
34			Momonoki River	Utsuboi Bridge	Maebashi City		14			0			10		0			0			0	0		0		M	0	34	1.32	1
35			Arato River	Okuhara Bridge	1		0			0			0		0			0			0	0		0		A.	0	35	2.12	/
36		Tonegawa	Kasukawa River	Hozumi Bridge		1	12			23			13		20			0			177	0		0			44	36	1.79	
37		Kiver Area	Hirose River	Nakajima Bridge	Isesaki City	F	18			24			21		15			0			31	1	1	10		N.A.	14	37	0.81	
38				Havakawa Bridee	1	⊢	55		-	62			22		30	\vdash		35			82			48	\vdash	× × ×	40	78	0.96	<u> </u>
20			Hayakawa River	Masiima Baidaa	Ohe City		26			107			100		100		_	122			84			40			~ **	20	0.90	3
37				Maejana ix kige	Chivoda Town /Gvoda		50			107			109		100			125			04			57	_	.1 .	74	39	0.48	<u> </u>
40			Tonegawa River	Tone-ozeki Weir	City			16 18	16	11	18		19		16			23	17	15	16 11	E		18		min	16	40	1.21	/
41			Koguro River	Kayano Bridge	Kiryu City		36	76	87		97 57		74		70			42	33	66	51 61	5		49		10m	51	41	0.72	>
42			Watarase River	Takatsudo	Midori City		69				59		16		27			22			18	3.		26		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	25	42	0.47	>
43				water channel	Kiryu City		36	22	35	55	15		26		29			27	35	33	36 121	2		33		more	J, 44	43	0.48	
44		Watarase River	Tatara River	Ejiri Bridge	Oura Town		31			225			86		19			33			48	4		44		W	42	44	1.14	MM.
45		Area	Kiron Dioar	Kannon Bridge	Kiryu City		74			67			29		36			59			90	43		65		M	64	45	0.63	1
46			yu wurdi	Sakai Bridge	Kiryu City/Ashikaga City		11			19			32		25			0			35	1		18		5	16	46	0.86	1
47			Tsuruuda River	Lake Jonuma	Tatebayashi City		730			1,510			870	1	,230			156			327	1,1	00	940		1.1/~	ر 631	47	0.61	\mathbb{N}
48			Yatagawa River	Togoda Bridge	Meiwa Town/Itakura Town		14			192			82		33			169			12	5		29		When	65	48	1.31	1
						*1: Bl	ank cel	ls are locatio	ns whe	re sam	iples were no	t collec	ted. Tł	ne result	"Not dete	table"	s indic:	ated as	"0."			А	В	с	D	E	38	Average		
						*2: A1	ithmeti	c Average: c	alculat	ed by a	assuming ND	=0; Co	lor cod	es show	categories	(see th	e right)										ι	L	1	
						*1 *													_	_										
L						~5: Re	suis ol	une analysis	or tre	nts al r	espective loc	auons	using th	ic metho	u exptaine	u on 4.3	(1)2)		Ż	Decre	asing	Increasi	ig î	~• Ui	ac hanged	Huctuatio	10 10			

Table 4.3-16 Detection of radioactive cesium at respective locations

(Gunma Prefecture: river sediments) (No.3)

7) Chiba and Saitama Prefectures and Tokyo Metropolis

In Chiba and Saitama Prefectures and Tokyo Metropolis, surveys were conducted 20 to 36 times from October 2011 to January 2017 at 51 locations (rivers) in public water areas (47 locations in Chiba Prefecture, two locations in Saitama Prefecture, and two locations in Tokyo Metropolis).

Regarding the concentration levels of detected values, six locations were categorized into Category A, eight locations into Category B, 18 locations into Category C, 13 locations into Category D, and six locations into Category E (see Table 4.3-17 and Table 4.3-18).

Concentration levels were generally decreasing at 41 locations, were unchanged at two locations and fluctuating at eight locations.

Table 4.3-17 Categorizations of detected values at respective locations (Chiba and Saitama Prefectures and Tokyo Metropolis: river sediments)

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	6	No. 1, No. 8, No. 10, No. 15, No. 26, No. 28
В	Upper 5 to 10 percentile	8	No. 3, No. 7, No. 12, No. 17, No. 18, No. 19, No. 20, No. 29
С	Upper 10 to 25 percentile	18	No. 9, No. 11, No. 13, No. 14, No. 16, No. 21, No. 24, No. 27, No. 30, No. 31, No. 38, No. 39, No. 40, No. 41, No. 42, No. 44, No. 46, No. 50
D	Upper 25 to 50 percentile	13	No. 4, No. 5, No. 6, No. 22, No. 23, No. 32, No. 33, No. 36, No. 37, No. 43, No. 45, No. 47, No. 51
Е	Lower than upper 25 to 50 percentile (lower 50%)	6	No. 2, No. 25, No. 34, No. 35, No. 48, No. 49





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-10 Changes in concentration levels over the years at respective locations (Chiba and Saitama Prefectures and Tokyo Metropolis: river sediments)

Table 4.3-18 Detection of radioactive cesium at respective locations (Chiba and Saitama Prefectures and Tokyo Metropolis: river sediments) (No.1)

			Location					Ri	iver se	dimen	ts/Rad	ioactive	Cesiı	m (Cs	-134+	Cs-13	7)/Con	centra	tion(B	q/kg)(*	1)				
No	Prefecture	,	Water area	Location	Municipality				FY2	2011									FY2	2012					
	Trefecture			Lacinon	Munic punty	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1			Shogan Piyar	Fukama-ohashi Bridge	Inzai City /Sakaa Town				1,910			1,780				1,660		1,190			1,200		590		
2			Shogen River	Shinbei Bridge	inzai čity / Sakač 10wii			50				72				149		81			54		56		
3				Intake at Maeshinden Water Purification Plant				1,000				950				1,230		850			310		430		
4		Tonegawa River	Nagato River	Nagato Bridge	Sakae Town			660				510			500			430			300		244		
5		System	-	Fujimi Bridge				700				920		_	550			390			480		410		
-			n	P				700	107			260			147			224			200		250		
0			Ryudai River	Ryumatsuno Bridge	Narita City				197			200			147			234			290		550		
7			Nekona River	Shinkawa Floodgate					2,300			2,010			910			1,620			640		1,080		
8			Ohori River	Kitakashiwa Bridge	Kashiwa City				9,700			4,100			12,000			5,100			3,000		4,200		
9			Oten River	Sanno Bridge, under	Kamagaya City				3,900			440			390			2,140			900		710		
10			Olsu River	Kaminuma Bridge	V 11 - 65				5,000			9,000			20,200			14,000			380		14,200		
11		Feeder rivers of Lake Teganuma	Someiriotoshi	Someishinbashi Bridge	Kashiwa City				3,100			5,100			990			4,900			5,700		2,900		
12				Downstream of Karuizawasakai	Kamagaya City /Shiroi				2,500			2,260			7,100			7,200			1,300		1,430		
13			Kanayamaotoshi	Bridge Nauchi Bridge	City Shiroi City				2.200			2.400			1.800			1.270			1.330		1.210		
14				V				256	_,			260			600			560			1,620		5 200		
14			Kamenari River	Downstream of Igusasuiro	Inzai City			230				500			000			300			1,620		3,300		
15			Igusasuiro Channel	Channel	Kamagaya City				3,500			4,100			3,200			2,800			3,500		2,750		
16			Futae River	Tomigaya Bridge	City				2,700			3,300			1,640			1,760			1,150		1,460		
17			Kanzaki River	Kanzaki Bridge	Yachiyo City /Inzai City				2,800			2,380			2,170			830			1,650		1,150		
18			Kanno River	Kanno Bridge					3,300			1,250			5,000			2,410			880		730		
19			Inba Discharge Channel(Upper reaches)	Yachiyo Bridge	Yachiyo City				3,700			7,800			3,200			910			2,530		1,280		
20		Feeder rivers of Lake	Teguri River	Mumei Bridge	Sakura City				2,500			3,200			3,000			3,600			3,100		2,780	-	
21		moanuma	Moroto River	Moroto Bridge	Inzai City				1.760			1.290			1.340			1.640			850		2.330		
22			Vashima Dinar	Innotonei Beidan	,				179			220		_	170			219			170		144		
22			Kasnima River	Iwatomi Bridge					1/8			250			170			218			179		144		
23	Chiba		Takasaki River	Ryuto Bridge	Sakura City				350			310			340			270			890		310		
24	Prefecture		Kashima River	Kashima Bridge					130			149			173			126			1,080		143		
25			Inbasuiro Channel	Tsurumaki Bridge	Inzai City				470			460				410		250			226		291		
26			Toneunga Canal	Unga Bridge	Nagareyama City/Noda City				3,200			3,100				2,210		1,950			2,550		3,000		
27			Edogawa River	Nagareyama Bridge	Nagareyama City/Misato				240			220				166		520			410		275		
28			Sakagawa River	Benten Bridge	Cuy				4,900			3,900				3,500		1,990			3,600		3,400		
29			Shinsaka River	Sakane Bridge	Matsudo City				4.600			4.600				3,300		3,700			2.520		3.600		
30				Shinkatauchika Bridge	Matsudo City/Katsushika				1.360			1.010				1.120		1 110			740		700		
30				Shinkasushka bruge	City				1,500			1,010		_		200		1,110			740		250	\rightarrow	
31				Ichikawa Bridge	Ichikawa City/Edogawa City											290		64			15		350		
32			Edogawa River	Vicinity of Keiyo Road	cuy											145		137			218		216		
33				(upperreaches)	Ichikawa City											350	420	1,140	300		190		370		
34				Shingyotokubashi Bridge	,				78			59				104	44	48	35		53		17		
35		Edogawa River System		Edogawa Floodgate, down								850							136		109		103		
36				8 km Point to the estuary	Ichikawa City/Edogawa City											71	128	134	340		121		145		_
37			Kyu-Edogawa River	Imai Bridge	-my											70	75	73	104		92		75	\neg	-
29				Urayasu Bridge	Urayasu City/Edogawa				75			380	\vdash			70	71	1 360	580		2 050		1 640	-+	-
20			Managara Direct	Namata Elanda 1	City				1 100			1.050				060	, 1	700	550		700		750	-+	
- 59			wanagawa kiver	ivenioto Pioodgate					1,100			1,050				900		/00			700		/30	-+	
40			Kokubu River	Suwada Bridge Before the confluence with	Ichikawa City				2,020			1,610				1,200		5,400			2,390		9/0	\rightarrow	
41			Haruki River	Kokubu River	V				1,380			1,270				1,210		930			840		760		
42			Hasen-okashiwa River	Downstream of Nakazawashinbashi Bridge	Kamagaya City/Ichikawa City				710			1,220				800		153			189		166		
43			Okashiwa River	Sengen Bridge	Labiharan Cita				970			790			_]	780		610			790		730		
44			Mamagawa River	Mitomae Bridge	icinkawa City				430			4,700				4,500		920			580		2,020		
45		Ebigawa River		Yachiyo Bridge	Funabashi City				6,400			340				6,000		410			530		1,160		
46		Inba Discharge		Shinhanamigawa Bridge					167			1,770				530	208	1,020	1,730		2,900		1,270		_
47		Channel (lower Miyako River		Miyako Bridge	Chiba City				50			171				530	-	241			91		193		
10		,	Arakawa River Middle	Onari Bridge	Konosu City							25	\vdash	_		10		25			37		12	\rightarrow	
48	Saitama Prefecture		Reaches	onail binge	m h ci									_		19		20			51		12	-+	
49		Arakawa River System	Arakawa River Lower Reaches	Sasame Bridge	1 oda City							530	\vdash			266		61			490		540	\dashv	
50	Tokyo			Kasai Bridge	Koto City /Edogawa City							700				131	520	217	280		300		175	$ \rightarrow$	
51	metropolis		Sumida River	Ryogoku Bridge	Chuo City							580				260	370		300	470	670		310		
						Total n of sa	umber nples	1,170	Dete tim	ction 1es	1,157														
					l	*1: Blar	ık cells	are loca	ations w	here sa	mples v	vere not	collected	. The	result "I	Not dete	ectable"	is indic	ated as	"0."					

Table 4.3-18 Detection of radioactive cesium at respective locations (Chiba and Saitama Prefectures and Tokyo Metropolis: river sediments) (No.2)

			Location									Rive	r sedin	nents/F	Radioa	tive C	esium	(Cs-13	4+Cs	-137)/Concer	ntration	n(Bq/k	g)(*1)						
No.	Prefecture	,	Water area	Location	Municipality						FY2	2013										I	Y2014	4		10			
						4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	-		Shogen River	Fukama-ohashi Bridge	Inzai City /Sakae Town		1,800			1,750			1,840		1,810				1,370			1,210	\vdash		1,150		1,170		<u> </u>
2	-			Shinbei Bridge Intake at Maeshinden Water			26			50			31		55				31			5/	\vdash		59			27	-
3	-	Topogenia Pinar		Purification Plant			420			210			320		420				171			229			369			178	—
4		System	Nagato River	Nagato Bridge	Sakae Town		285			217			291		420				263			173			185			207	<u> </u>
5				Fujimi Bridge			390			370			340		370				283			248			255			258	
6			Ryudai River	Ryumatsuno Bridge	Narita City			236		177			49		45				46			89			161		48		1
7			Nekona River	Shinkawa Floodgate	runni Cuy			720		1,330			1,020		910				920			1,160			580		221		
8			Ohori River	Kitakashiwa Bridge	Kashiwa City		7,900			7,600			2,560		2,690				5,200			2,660			1,550		1,700		
9				Sanno Bridge, under	Kamagaya City		1,600			1,250			930		820					1,120		610			680		470		
10			Otsu River	Kaminuma Bridge			6,700			6,000			5,400		1,970				3,360			3,640			1,290		1,220		
11		Feeder rivers of Lake	Someiriotoshi	Someishinbashi Bridge	Kashiwa City		305			430			1,310		1,190				1,100			1,160			900		790	_	-
12	-	reganuma		Downstream of Karuizawasakai	Kamagaya City /Shiroi		920			820			460		460				440			440			440		305		
13	-		Kanayamaotoshi	Bridge Nauchi Bridge	City Shiroi City		1.280			1 170			750		710				129			510			510		392		
	-				s i c		2,000			2,000			100		222				200			200	\vdash		410		410		
14	-		Kamenari River	Kamenari Bridge Downstream of Igusasuiro	Inzai City		3,000			2,080			162		222				205			390	\vdash		410		419		-
15	-		Igusasuiro Channel	Channel	Kamagaya City Funabashi City /Shiroi			2,980		1,890			800		9/0				2,070			1,060	\vdash		740			750	-
16	-		Futae River	Tomigaya Bridge	City		1,150			1,480			760		760					730		640	\square		600		456		H
17	_		Kanzaki River	Kanzaki Bridge	Yachiyo City /Inzai City		1,590			1,790			680		670				850			550			458		309		—
18			Kanno River	Kanno Bridge	Yachiyo City		2,840			2,780			126		58				265			620			640		540		L
19			Inba Discharge Channel(Upper reaches)	Yachiyo Bridge			202			231			2,030		1,080				1,220			1,220			1,050		352		
20		Feeder rivers of Lake Inbanuma	Teguri River	Mumei Bridge	Sakura City		1,620			1,900			1,280		1,390				1,250			1,000			760		1,000		
21			Moroto River	Moroto Bridge	Inzai City		1,910			2,020			810		1,010				540			420			234		408		
22			Kashima River	Iwatomi Bridge			284			307			205		154				167			181			126		153		
23			Takasaki River	Ryuto Bridge	Sakura City		450			550			143			154			157			380			155		232		
24	Chiba		Kashima River	Kashima Bridge				149		127			12			0			132			139			120		126		-
25	Prefecture		Inbasuiro Channel	Tsurumaki Bridge	Inzai City			182		81			150		149				99			58			125			70	
26	-		Toneunes Canal	Unos Bridae	Nagareyama City/Noda		1 940			2 480			2 000		1 240				980			2 270			2 100			2450	
27	-		Edogawa River	Nagarevama Bridge	City Nagareyama City/Misato		191			450			348		282				216			155			175			292	_
21	-		Sakagawa Rivar	Pantan Pridaa	City			3 300		3.040			2 730		3 000				3 240			2.000	\vdash		1.840			1260	<u> </u>
20	-		oakagawa Kivei	a h p i h	Matsudo City			3,300		1,050			1,020		1,000				000			1,220			1,040			1200	
29	-		Shinsaka River	Sakane Bridge	Matsudo Citv/Katsushika			2,350		1,950			1,820		1,080				990			1,330	\vdash		1,100			1200	<u> </u>
30	-			Shinkatsushika Bridge	City			890		820			1,150		920				630			670	\vdash		570			490	
31	_			Ichikawa Bridge	Ichikawa City/Edogawa City			258		206			250		287				92			219	\square		171			114	I
32	_		Edogawa River	Vicinity of Keiyo Road	City			380		330			175		164				235			180			93			142	
33				Gyotokukadozeki Weir (upperreaches)	Ichikawa City			660	550	580	960	1,020	420		330				520	390	500	400	680		540			490	
34				Shingyotokubashi Bridge	,			20		19			20		12				16			11			15			16	
35		Edogawa River System		Edogawa Floodgate, down				83		84			56		70				38			42			31			50	I
36				8 km Point to the estuary	Ichikawa City/Edogawa City			283		310			112		65				360			139			30			368	1
37	1		Kyu-Edogawa River	Imai Bridge				48		108			50		323				67			27			31			54	
38				Urayasu Bridge	Urayasu City/Edogawa			700	380	700	850	810	440		940				920	840	680	590	650		760			700	
39			Mamagawa River	Nemoto Floodgate	City			480		480			222		295				279			335			260			255	
40	-		Kokubu River	Suwada Bridee	Ichikawa City			790		730			770		770				520			530			406			430	
41	-		Haruki River	Before the confluence with				730		710			304		309				306			321			286			277	_
41	-		Haruki Kivei	Kokubu River Downstream of	Kamagaya City/Ichikawa		440	750		250			179		560				222			215	\vdash		200			277	
42	-		Hasen-okashiwa River	Nakazawashinbashi Bridge	City		440			350			1/8		500				323			215	\vdash		50			211	<u> </u>
43	-		Okashiwa River	Sengen Bridge	Ichikawa City			440		410			158		141				175			251	\vdash		156			144	-
44			Mamagawa River	Mitomae Bridge				5,800	4,900	5,900	3,010	3,180	138		34				295	1,060	730	314	411		670			460	—
45	_	Ebigawa River		Yachiyo Bridge	Funabashi City			410		460			80		640					108		167			213		52		<u> </u>
46	1	Channel (lower		Shinhanamigawa Bridge	Chiba City			960	1,640	1,130	1,680	1,590	146		232					329 154	174	284	570		131		160		
47		Miyako River		Miyako Bridge				238		259			750		500				410			85			56		125		
48	Saitama		Arakawa River Middle Reaches	Onari Bridge	Konosu City		34			38			10		19				17			0			10			10	
49	Prefecture	Arakawa River	Arakawa River Lower Reaches	Sasame Bridge	Toda City		41			49			67		36				53			48			35			68	
50	Tokyo	System		Kasai Bridge	Koto City /Edogawa City			248		75			316		450				430			317			410			330	
51	Metropolis		Sumida River	Ryogoku Bridge	Chuo City			450		460			283		278				145			147			160			96	
			1	1		*1: Bk	ank cell	s are k	cations	where	sample	s were	not col	lected	The re	sult "No	ot dete	ctable"	is indic:	ated as '0".									_
											,																		

Location											River	sedim	ents/Radioact	tive Ce	sium (Cs-134+	Cs-1	37)/Co	ncentrati	on(Bq/	kg)(*1)						1	Average of	Ne	Coeffic ient	Terrs 44 (#7)
No. Prefecture V			Water area	Location	Municipality	4	5	6	7	8	9 10	11	12 1	2	3	4	5	6	7		9	10 1	1	12 1	2	3	Changes	(*2)	No.	of variation	Trends(#3)
1			Shogen River	Fukama-ohashi Bridge		~	1.010			1.070	, 10	1.000	910	~	5	- 9	60	0	80	0	<i></i>	8		900	-	-	~		1	0.32	
2	2	Tonegawa River System		Shinbei Bridge	Inzai City /Sakae Town		30			18		25	0				0	-	28	3			9	25		+	Â., ê	18	2	0.74	Ś
3				Intake at Maeshinden Water			431			438		389	411			4	07		49	9		4	29	358		+	-1	438	3	0.58	$\overline{}$
-			Nagato River	Purification Plant	Sakae Town Narita City		129			166		149	172				10	_	16	•			77	206		-	~~~~	155	-	0.54	~
-				Fuinci Daidan			158			206		140	1/3				07	_	10	2			4	151	-	+	1.	155	4	0.59	~
2				Pujimi Bridge			10/			200		162	185				82		17				14	151	-	+	~~~~		3	0.39	~
0			Ryudai River	Ryumatsuno Bridge			31			48		101	44				90	_	00	,		1	15	35	_	+	·	~ 14	0	0.72	~
7			Nekona River	Shinkawa Floodgate			880			640		/60	508			5	40		58	2		3	13	497		+-	w-~	~ 5/3		0.55	~
8			Jhori River	Kitakashiwa Bridge	Kashiwa City		1,780			2,380		1,480	1,470			2,	740		1,75	50		1,	00	1,28	0	+-	m.	1,793	8	0.78	1
9			Otsu River	Sanno Bridge, under	Kamagaya City		385			471		460	432			2	98		42	7		4)3	304		+-	w~_	358	9	0.94	~
10		Easdar rivers of Lake		Kaminuma Bridge	Kashiwa City		2,790			3,290		3,450	4,100			2,	350		2,20	50		1,7	30	900	'	╇	1~~~	1,810	10	0.98	
11		Teganuma	Someiriotoshi	Someishinbashi Bridge			640			510		510	605			3	24		24	1		4	93	383		_	<u>n</u>	306	11	1.12	>
12			Kanavamaotoshi	Downstream of Karuzawasaka Bridge	City		510			469		660	560			6	11		66	6		3	97	660			Λ	584	12	1.40	>
13				Nauchi Bridge	Shiroi City		590			600		518	534			3	64		41	4		3	93	409			~~~	395	13	0.70	1
14			Kamenari River	Kamenari Bridge	Inzai City		750			519		363	302			3	66		25	5		4)6	257			<u></u>	321	14	1.43	NM.
15			Igusasuiro Channel	Downstream of Igusasuiro Channel	Kamagaya City		1,110			920		1,080	1,060			1,	010				970	7	80	800			m	890	15	0.64	1
16			Futae River	Tomigaya Bridge	Funabashi City /Shiroi City		459			510		439	447			3	63				388	3	79	367			L	374	16	0.79	~
17			Kanzaki River	Kanzaki Bridge	Yachiyo City /Inzai City		403			411		416	97			3	37		66	0		6	37	296		Т	m	483	17	0.79	1
18 19		Feeder rivers of Lake Inbanuma	Kanno River	Kanno Bridge			198			262		105	900			7	20		65	5		4	71	504			M_	588	18	1.12	1
			Inba Discharge Channel(Upper peaches)	Yachiyo Bridge	Yachiyo City		2,150			1,350		1,460	1,580			1,	310		10	6		1,3	50	390			1	764	19	1.00	
20			Teguri River	Mumei Bridge	Sakura City		860			610		1,010	740			8	60		66	0		8	50	667		1	~	759	20	0.62	
21			Moroto River	Moroto Bridge	Inzai City		354			300		208	511			1	81		21	9		1	15	159			w.	176	21	0.83	1
			Kashima River	Iwatomi Bridge	Sakura City Inzai City		98			81		76	63				83		72	2			7	68	+	+	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	70	22	0.48	
23			Takasaki River	Rvuto Bridge			125			131		133	161			1	18		22	5		1	11	127		+	h.	145	23	0.70	
24	Chiba		Kashima River	Kashima Bridee			13			266		404	79				35		43	2		3	12	255		+	1	259	24	1.14	1 AAA
25	Prefecture		Inhacuiro Channel	Teurumaki Bridan			104			151		100	107				20	_	24	-			<	20	-	+	~~~~	48	25	0.80	<u> </u>
25			Tanuna Cani	I surumuki isinge	Nagareyama City/Noda		600			1.360		2.440	2 240			4	120	_	1.2	20			5	20	0	+	~~~	40	25	0.30	~~~
20			Tolicaliga Calia	Curga Bridge	City Nagareyama City/Misato		1070		_	1,200		2,440	3,240			*,	150	_	1,5	20		2,0	00	102		+-	NA .	100	20	0.57	
27			Salearanya Dir	Nagareyania nange	City		127		_	070		1.070	105					_	20	0			10	102	_	+-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	A 108	20	0.54	<
28			Sakagawa River	Benten Bridge	Matsudo City		1,170			970		1,070	1,140			,	00		80	0		9	10	778		+	~	802	28	0.56	1
29			Shinsaka River	Sakane Bridge	Matsudo City/Katsushika		880			1,000			1,140 1,070			8	10	_	89	0		7	70	790	-	+	~~~	815	29	0.66	1
30			Edogawa River	Shinkatsushika Bridge	City		508			510		306	340			4	17		14	9		1	90	193		+	~~~	237	30	0.51	
31				Ichikawa Bridge	Ichikawa City/Edogawa City		231			242		278	580			6	29	_	14	6		1	74	108	-	+	v~	ີ 264	31	0.62	1/1/14
32				Vicinity of Keiyo Road	Ichikawa City		144			95		38	41				70				89	1	0	49	_	┿	m	~ 65	32	0.62	>
33				(upperreaches)			630	790	289	610	21	43	67				46	52	82	42	153	6	5	135	_	_	1 mg	82	33	0.73	1004
34		Edogawa River System		Shingyotokubashi Bridge			17			18		25	27			1	23		12	2		1	6	0		\perp	M	13	34	0.82	>
35			Kyu-Edogawa River	Edogawa Floodgate, down	Ichikawa City/Edoar		35			57		26	22				15				51	1	7	24			1	27	35	1.90	>
36				8 km Point to the estuary	Ichikawa City/Edogawa City		114			279		87	110				50				58	3	2	111			Mu	65	36	0.70	NM.
37 38 39 40 41 42 43				Imai Bridge			25			28		27	39			1	75				205	1	8	76			~h_	119	37	0.88	NM.
				Urayasu Bridge	Urayasu City/Edogawa City		650	740	760	539	660	29	322			3	71	370	335 37	5	369	3	12	329			Am	356	38	0.67	NM.
			Mamagawa River	iemoto Floodgate			214			207		232	214			2	03		18	6		2	17	225		T	1	208	39	0.69	1
			Kokubu River	Suwada Bridge	Ichikawa City		304			293		570	437			2	23		27	1		3	35	243			1	281	40	1.19	/
			Haruki River	Before the confluence with Kokubu River			210			242		198	281			2	75		25	6		1	34	225			/	223	41	0.75	>
			Hasen-okashiwa River	Downstream of Nakazawachinbachi Bridon	Kamagaya City/Ichikawa		328			196		261	267			2	01		22	6		2)7	213			1.	212	42	0.78	~
			Okashiwa River	Sengen Bridge	City		137			168		143	131			1	30		14	9		1	27	124		+	~	133	43	0.83	
44			Mamagawa River	Mitomae Bridge	Ichikawa City		640	487	440	196	137	178	176			3	80	664	332 68	0	216	3	31	434		+	ΛA	434	44	1.33	
45		Ebigawa River	-	Yachiyo Bridge	Funabashi City		102			31		61	165				35		14	5		1	9	44	1	+	W Lan	63	45	2.21	$\overline{}$
46		Inba Discharge Channel (lower Miyako River		Shinhanamizawa Bridan	Chiba City		199	96	74	79	95	169	197			2	12	333	331 34	0	99		9	211	+	-	ala	231	46	1.16	<u> </u>
47				Misako Bridan			37	~~		53	~~	42	107				82		001 05	2	~		<	64	-	+	1 A	72	47	1.00	
47		niyiko kirti	Arakawa River Middle	Oneni Deiden	Vanan Cita		0			0			.0,				0	_	-				<u> </u>	0	-	+	WA.	- 12	49	1.10	~
40	Saitama Prefecture	Arakawa River System	Reaches	Countrisinge	Konosu City		62			60		201	21				22	_	43				2	25	+	+	w.	26	40	1.10	~
*7			Arakawa River Lower Reaches	Consulter Dr Rege	No. C. P	<u> </u>	0.5			00		271	31						43	-		-		100	+	+	1 ~~	30	49	0.46	
50	Tokyo Metropolis			Kasai Bridge	Koto City /Edogawa City	├	404			210		279	272			2	:55	-	19	/		2	24 0	193	1	+	No.	217	50	0.46	
51			Sumida River	kyogoku Bridge	City	-	86			191		183	197				49		48	>		9	y	27	-	+	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	56	51	0.69	1
1						*1: Bk	ink cell	are loc	ations v	where s	amples were n	ot coll	ected. The resu	ilt "Not	detectal	ble" is ind	icated	as "0."					1	B C	D	E		397	Average	1	
1		*2: Ar	ithmetic	Averag	ge; calc	ulated b	y assuming NI	D=0; C	Color codes show	w categ	ories (s	ee the rigl	u).																		
1						*3: Re	sults of	the anal	lysis of	trends a	at respective lo	cation	s using the meth	hod exp	lained o	n 4.3(1)2)			>> De	creasinį	~ ~>	Increas	ing	~~ + U	inc hang	_j ed	∧∧ Fluctuatio	ns			

Table 4.3-18 Detection of radioactive cesium at respective locations

(Chiba and Saitama Prefectures and Tokyo Metropolis: river sediments) (No.3)
(2)-2 Lakes

1) Miyagi Prefecture

In Miyagi Prefecture, surveys were conducted 11 to 21 times from October 2011 to December 2016 for lake sediment samples collected at 21 locations.

Regarding the concentration levels of detected values, one location was categorized into Category C, three locations were categorized into Category D and 17 locations were categorized into Category E (see Table 4.3-19 and Table 4.3-20).

Concentration levels were generally decreasing at 12 locations, unchanged at three locations, and fluctuating at six locations.

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	1	No. 16
D	Upper 25 to 50 percentile	3	No. 9, No. 13, No. 17
Е	Upper 50 to 100 percentile (lower 50%)	17	No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 7, No. 8, No. 10, No. 11, No. 12, No. 14, No. 15, No. 18, No. 19, No. 20, No. 21

 Table 4.3-19 Categorizations of detected values at respective locations

 (Ming al Disfectures labels and line

(Miyagi Prefecture: lake sediments)





(Miyagi Prefecture: lake sediments) (No.1) Location Lake Sediments/Radioactive Cesium (Cs-134+Cs-137)/Concentration(Burke)(*1)														ime	ente	s) (No	.1)										
		Location	1						Lake	Sedime	nts/Ra	dioacti	ve Cesi	am (Cs	-134+	Cs-137	/Conc	entrati	on(Bq/l	kg)(*1)							
No.	Water	area	Location	Municipality	8	9	10	FY.	2011		2	3	4	5	6	7	8	FY 9	2012	11	12		2	3	_			
1		Kurikoma Dam	Dam site				1,100			1					800			290		242								
2		Hanayama Dam	Dam site	Kurihara City			440								2,290			1,780	,	300								
3	Kitakami River System	Narugo Dam	Dam site				490								290			1,190	,	660								
4		Lake Naganuma	Dam site	Osaki City			1,180				350				420			610		780								
5		Shukunosawatameike Bond	Pond exit	Kurihara City			440								1,260					183								
6		Futatsuishi Dam	Dam site				2,300									370		560		550								
7	Naruse River System	Urushizawa Dam	Dam site	Kami Town				700								440			330	115								
8		Minamikawa Dam	Dam site	Taiwa Town			2,600			1		1			1,600				1,520	1,330	0			+				
9	Sunaoshi River System	Sonoseki Dam	Dam site	Rifu Town			710					1			1,190					2,640	0			1				
10	Nanakita River System	Nanakita Dam	Dam site				400								232				148	44				1				
11	Marutazawatameike Pond		Pond exit	+			1,100								940					69								
12	Natori River System	Okura Dam	Dam site	Sendai City			440					1							1,150					+				
13	Lake Amanuma		Lake exit	1			2,200				3,00)			1,080				1,940	9,70	0			+				
14	Natori River System	Kamafusa Dam	Dam site	Kawasaki Town			85				1				1	1,090		126	1	204			1	+				
15		Kawarago Dam	Dam site	Shiroishi City			730				1				1	660		280	1	5,70	0	460		+				
16	Abukuma River System	Shichikashuku Dam	Dam site	Shichikashuku Town			2,160				-				3,000	\vdash		840	1	1,89	0	1,67	0	+	1			
17	Lake Bagyunuma	<u> </u>	Lake exit	Shiroishi City			1,810				\square		1		1,310			1,940	,		1			+				
18	Abukuma River System	Murata Dam	Dam site	Murata Town			370									0			1	115	+			+	1			
19	Kitakami River System	Lake Izunuma	Lake exit	Tome City			900				420				48			195		270		320						
20	Natori River System	Tarumizu Dam	Dam site	Natori City			185								270				222	460								
21	Naruse River System	Miyatoko Dam	Dam site	Taiwa Town			31								12					163								
21 Naruse River System Miyatoko Dam Dam site Taiwa Town 31 1 12 Total number of samples *1: Bank cells are locations where samples were not collected. The result "Not detectable" is in																		1	1		I	-						
21 Naruse River System Miyatoko Dam Dam site Taiwa Town 31 1 12 163 163																												
Image: Total number of samples 385 Detection incomes 381 *1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0." *1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0." Location Lake Sediments/Radioactive Cesium (Cs-134+Cs-137)/Concentration(Bq/kg)(*1) No. Water area Location Municipality FY2013 FY2014																												
100 minubes 385 Detection of samples 381 *1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0." *1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0." Total are a tota																												
No.	Water	area	Location	Municipality	4	6		7	0	FY2	013		10	.	2	2		6	6	7		FY2	014		12			2
1		Kurikoma Dam	Dam site		4	5	193	/	8 241	9	10	11	69	1	2	3	4	164	0	/	8	23	10	11	12	1	2	3
2		Hanayama Dam	Dam site	Kurihara City			320		243		225		184					185			168		153		161			
3	Kitakami River System	Narugo Dam	Dam site				770		650		520		540						420		394		350		331			
4		Lake Naganuma	Dam site	Osaki City			470		146		318		238					580				141	384		392			
5		Shukunosawatameike	Pond exit	Kurihara City			161		176		216		225					246			164		19		76			
6		Pond Futatsuishi Dam	Dam site				510		331		369		760						450		245		480					
7	Naruse River System	Urushizawa Dam	Dam site	Kami Town			390		390		343		364						286		231		284		252			
8		Minamikawa Dam	Dam site	Taiwa Town			1,230		1,970		1,080		1,030				+	1,180			432		476		1,000			
9	Sunaoshi River System	Sonoseki Dam	Dam site	Rifu Town		-	1,920		1,950		88		2,540		+		+		1,750		1,150		415		2,080			
10	Nanakita River System	Nanakita Dam	Dam site			-	107		213		80		380		+		+	340	+			91	33		20			1
11	Marutazawatameike Pond	<u> </u>	Pond exit	†		-	380		222		129		181	\dashv	+		+	\dashv	313			165	109		94			
12	Natori River System	Okura Dam	Dam site	Sendai City			88		47		175		68	\neg			+	0				41	46		35			
13	Lake Amanuma	I	Lake exit	1			2,930		2,180		1,220		1,550				+		1,190		1,720		1,580		1,050			
14	Natori River System	Kamafusa Dam	Dam site	Kawasaki Town		-	620			690	590		450	\dashv	+		+	\dashv	430		530		431		395			
1			n .	Shiroishi City			620		790		380		297	\dashv	+		+	630	+		430		306		352			
15		Kawarago Dam	Dam site				1,310			1,750	1,400		1,550	\neg			+	\neg	1,750		2,220		1,960		1,700			
15 16	Abukuma River System	Kawarago Dam Shichikashuku Dam	Dam site Dam site	Shichikashuku												\rightarrow	_											
15 16 17	Abukuma River System Lake Bagyunuma	Kawarago Dam Shichikashuku Dam	Dam site Dam site Lake exit	Shichikashuku Town Shiroishi City			340		231		1,380		4,200	ļ				160				560	830		215			
15 16 17 18	Abukuma River System Lake Bagyunuma Abukuma River System	Kawarago Dam Shichikashuku Dam Murata Dam	Dam site Dam site Lake exit Dam site	Shichikashuku Town Shiroishi City Murata Town			340 430		231		1,380 92		4,200					160 259				560	830 121		215			
15 16 17 18 19	Abukuma River System Lake Bagyunuma Abukuma River System Kitakami River System	Kawarago Dam Shichikashuku Dam Murata Dam Lake Izunuma	Dam site Dam site Lake exit Dam site Lake exit	Shichikashuku Town Shiroishi City Murata Town Tome City			340 430 340		231		1,380 92 350		4,200					160 259 208				560	830 121 149		215			
15 16 17 18 19 20	Abukuma River System Lake Bagyunuma Abukuma River System Kitakami River System Natori River System	Kawarago Dam Shichikashuku Dam Murata Dam Lake Izunuma Tarumizu Dam	Dam site Dam site Lake exit Dam site Lake exit Dam site	Shichikashuku Town Shiroishi City Murata Town Tome City Natori City			340 430 340 326		231		1,380 92 350 288		4,200					160 259 208	329			560	830 121 149 79		215			
15 16 17 18 19 20 21	Abukuma River System Lake Bagyunuma Abukuma River System Katakami River System Natori River System Naruse River System	Kawarago Dam Shichikashuku Dam Murata Dam Lake Izunuma Tarumizu Dam Miyatoko Dam	Dam site Dam site Lake exit Dam site Lake exit Dam site Dam site	Shichikashuku Town Shiroishi City Murata Town Tome City Natori City Taiwa Town			340 430 340 326 195		231		1,380 92 350 288 18		4,200					160 259 208 75	329			560	830 121 149 79 66		215			
15 16 17 18 19 20 21	Abukuma River System Lake Bagyunuma Abukuma River System Kitakami River System Natori River System Naruse River System	Kawarago Dam Shichikashuku Dam Murata Dam Lake Izunuma Tarumizu Dam Miyatoko Dam	Dam site Dam site Lake exit Dam site Dam site Dam site	Shichikashuku Town Shiroishi City Murata Town Tome City Natori City Taiwa Town	*1: Blan	nk cells :	340 430 340 326 195 rre loca	tions w	231	umples v	1,380 92 350 288 18 vere no	t collec	4,200	result	'Not det	tectable	' is ind	160 259 208 75 icated a	329 s "0."			560	830 121 149 79 66		215			
15 16 17 18 19 20 21	Abukuma River System Lake Bagyunuma Abukuma River System Kitakami River System Natori River System Naruse River System	Kawarago Dam Shichikashuku Dam Murata Dam Lake Izunuma Tarumizu Dam Miyatoko Dam	Dam site Dam site Lake exit Dam site Dam site Dam site	Shichikashuku Town Shiroishi City Murata Town Tome City Natori City Taiwa Town	*1: Blar	nk cells a	340 430 340 326 195 rre loca	tions w	231	umples v	1,380 92 350 288 18 vere no	t collec	4,200	result '	"Not det	tectable	' is indi	160 259 208 75 icated a	329 s "0."			560	830 121 149 79 66		215			

Table 4.3-20 Detection of radioactive cesium at respective locations

							(Лiy	/ag	i F	re	fe	ctu	lre	: la	ak	es	sec	lin	ner	nts) (No	.2)								
		Location	r									Lake	Sedin	nents/F	Radioa	ctive C	esium	Cs-134	+Cs	-137)/Co	ncentr	ation(B	q/kg)(*	1)					1	Average of		coefficient	Trends
No.	Water	area	Location	Municipality	4	5	6	7	8	FY20	15	11	12	1	2	3	4	5	6	7	8	FY2 9	016 10	11	12	1	2	3	Changes	FY2016 (*2)	No.	of variation	(*3)
1		Kurikoma Dam	Dam site				224		550		137		100					23			13		43		60				2.1	35	1	1.28	1
2		Hanayama Dam	Dam site	Kurihara City		124			123		204		196					234			241		175		165				Λ	204	2	1.44	1
3	Kitakami River System	Narugo Dam	Dam site			375			304		214		244					149			147		154		179				A	157	3	0.61	1
4		Lake Naganuma	Dam site	Osaki City		185			252		346		263					133			241		310		270				hm	239	4	0.64	Ĺ
5		Shukunosawatameike Pond	Pond exit	Kurihara City		173			218		24		10					118			80		146		112				1	114	5	1.28	Ĺ
6		Futatsuishi Dam	Dam site	V: T		560			390		410		182					164			266		81		163					169	6	0.98	Ļ
7	Naruse River System	Urushizawa Dam	Dam site	Kam rown		209			105		188		276					290			74		99		51				$\sim \sim \sim$	129	7	0.56	Ĺ
8		Minamikawa Dam	Dam site	Taiwa Town			690		451		560		282					103			116		114		268				~~~	150	8	0.75	Ĺ
9	Sunaoshi River System	Sonoseki Dam	Dam site	Rifu Town			1,250		1,690		1,380	:	1,730					1,610			2,090		1,440		1,620				~~~~	1,690	9	0.42	~~~*
10	Nanakita River System	Nanakita Dam	Dam site			18			70		32		37					26			23		12		38				M	25	10	1.08	\checkmark
11	Marutazawatameike Pond		Pond exit	Sendai City		199			90		179		94					110			113		171		236				m	158	11	1.09	1
12	Natori River System	Okura Dam	Dam site			0			20		89		288					57			32		54		65					52	12	1.82	1
13	Lake Amanuma		Lake exit			590			710		4,490	1	1,350					1,020			1,510		2,240		3,230				~~~	2,000	13	0.89	\sim
14	Natori River System	Kamafusa Dam	Dam site	Kawasaki Town		345			377		319		180					344			479		279		235				Ann	334	14	0.56	\sim
15	Abukuma River System	Kawarago Dam	Dam site	Shiroishi City		231			500		396		680					329			386		109		670					374	15	1.63	M
16	-	Shichikashuku Dam	Dam site	Shichikashuku Town		2,330			2,970	:	2,960	1	3,260					3,310			1,760		1,000		3,680				m	2,438	16	0.38	~~~
17	Lake Bagyunuma		Lake exit	Shiroishi City		270			1,320		1,070	:	1,070					1,090			1,070		1,000		990				~^~~	1,038	17	0.83	M
18	Abukuma River System	Murata Dam	Dam site	Murata Town		121					36							55					39						Vh-	47	18	0.95	MM
19	Kitakami River System	Lake Izunuma	Lake exit	Tome City		108					181							174					136						\searrow	155	19	0.77	1
20	Natori River System	Tarumizu Dam	Dam site	Natori City		121					190							108					135						~~~~	122	20	0.50	~~~
21	Naruse River System	Miyatoko Dam	Dam site	Taiwa Town			67				0							35					12						$\sqrt{1}$	24	21	1.04	\\\\
					*1: Bla	nk cells	are loc:	ations w	where san	nples w	ere not	collect	ed. The	e result	"Not d	etectabl	e" is in	dicated a	15 "0.'					A	В	С	D	E		460	Average	I	
					*2: Ari	ithmetic	Average	e; calcu	ilated by a	assumi	ng ND=	0; Colo	r code	s show	catego	ries (se	e the rij	(ht).		~	Decress	ing .	-> Inc	rossina	~~	▲ Incl	rsnaed	~~	Fluctuations				
L					-5: Re	suits OI	ure anal	iysis of	uenus at	respec	uve roca	mons u	sing th	e metho	n expi	anteu of	14.3(1)	<i>~</i>)		2	Decreas		, inc	casing		ouci	mageu						

Table 4.3-20 Detection of radioactive cesium at respective locations

107

2) Fukushima Prefecture

(i) Hamadori

In Hamadori, Fukushima Prefecture, surveys were conducted 19 to 54 times from September 2011 to February 2017 for lake sediment samples collected at 41 locations.

Regarding the concentration levels of detected values, eight locations were categorized into Category A, eight locations into Category B, 11 locations into Category C, nine locations into Category D, and five locations into Category E (see Table 4.3-21 and Table 4.3-22).

Concentration levels were generally decreasing at 21 locations, were unchanged at four locations, were fluctuating at 15 locations, and were generally increasing at one location.

Table 4.3-21 Categorizations of detected values at respective locations (Hamadori, Fukushima Prefecture: lake sediments)

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	8	No. 4, No. 5, No. 6, No. 10, No. 18, No. 22, No. 24, No. 25
В	Upper 5 to 10 percentile	8	No. 3, No. 7, No. 9, No. 15, No. 26, No. 27, No. 29, No. 32
С	Upper 10 to 25 percentile	11	No. 1, No. 11, No. 13, No. 16, No. 17, No. 20, No. 21, No. 30, No. 33, No. 35, No. 36
D	Upper 25 to 50 percentile	9	No. 2, No. 8, No. 23, No. 28, No. 31, No. 34, No. 38, No. 40, No. 41
Е	Upper 50 to 100 percentile (lower 50%)	5	No. 12, No. 14, No. 19, No. 37, No. 39





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-12 Changes in concentration levels over the years at respective locations (Hamadori, Fukushima Prefecture: lake sediments)

Table 4.3-22 Detection of radioactive cesium at respective locations (Hamadori, Fukushima Prefecture: lake sediments) (No.1)

		Location							Lak	e Sedir	nents/R	adioact	ive Ces	ium (C	s-134 +	Cs-137)	/Conce	ntratior	n(Bq/kg)(*1)			
No.	Wa	ter area	Location				FY2	2011					I	1				FY2	012	1			
			Location	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Soso (farm pond)	Takei	Shinchi Town		140		129		154		209				5,100			1,580	4,400	6,300	2,180		1,560
2	(tarini pond)	Uchizawa	Soma City		250		45		830	2,140													
3	Matsugabo Dam (La	ke Utagawa)			22,000		3,600		7,500							4,900	7,800	59,000	23,400				
4	Mano Dam	1			9,900		11,500		39,000		17,400			-		8,800	14,400	19,000	42	1,270 21,800		9,400 38,000	-
5	Soso (farm pond)	Ainosawa													59,000			103,000	8,100	15,500			
6	Ganbe Dam Reservo	jir .	Iitate Village		8,200		12,200									18,000	87,000	123,000	121,000				
7	Soso	Fugane Dam													12,000			20,500	26,600	26,500			
8	(farm pond)	Sasatoge													4,700			4,000	2,900	2,760			
9	Takanokura Dam Re	servoir			22,000		39,000		30,000		1,560					12,400	19,100	35,000	23,600				
10	Yokokawa Dam Res	ervoir			13,800		23,000		4,500		3,500					25,900	14,200	125,000	53,000		2,900	2,020	
11		Tarayachi	Minamisoma City												420	7,600	20,500	7,200				6,400	
12		Takeshiyachi																1,180	1,340	1,240	790		
13		Ryugasaku														47,000		1,080	17,400	12,500			
14	Soso	Uwatashiro	Kawamata Town												4,200			5,100	690	820			
15	(farm pond)	Koakuto	Namie Town												56.000			13.000	32.000	13.000			
16		Yosouchi	litate Village												70.000			33.000	44.000	27.700			
17		Myobusaku No. 2	Minamisoma City												2.240	5.800	1.180	830	5.100				2.250
18	Ogaki Dam		Namie Town		13.100		8.400		5.100		260.000				8,200	13.600	.,	51.000	35.000	30.000 37.000			-,
19		Uenokawa	Katsurao Village						.,		-				21,200	.,							
20		Heigoiri	Iitate Village												17.600			56.000	34.000	2,790			
21	Soso (farm pond)	Mekurasawa No. 2													11.700			11.400	7.900	12,100	13.200	11,500	
22		Joroku	Namie Town												96.000			40.000	23.800	10.000			98.000
23	Furumichigawa Pow	er Plant Dam	Tamura City													7,600	1,580	11,000	9,500				
24	Soso(farm pond)	Sawairi No. 1	Futaba Town															780,000	450,000	560,000			
25		Suzunai No. 4	Okuma Town															91,000	59,000	72,000	40,000	71,000	
26		Nishihaguro	Futaba Town												65,000			43,000	5,200	87,000	13,900	54,000	
27	Sakashita Dam				37,000		69,000		46,000		11,800				15,100	17,600		20,600	20,700	20,100	21,900	24,600	
28	Soso	Atamamori 2	Okuma Town												9,400			6,300	5,700	2,790	13,000	5,900	
29	(farm pond)	Yonomori	Tomioka Town												62,000		54,000		47,000	45,000	57,000	48,000	
30	Takikawa Dam		Kawauchi Village		31,000		50,000		80,000		110,000				28,000	7,600		4,100	8,600	760 630	690	850 45,000	
31		Takinosawa	Tomioka Town												13,200		4,700		10,300	10,300		I	11,800
32	Soso(farm pond)	Kamisigeoka No. 1													67,000		9,500	14,800	4,200		10,400		
33		Shimoshigeoka	Naraha Town												18,100		77,000	8,400	27,000		20,100	26,400	
34	Komachi Dam		Ono Town		1,730		1,460									2,480		7,500	8,200				
35	Kido Dam				11,400		17,600		810		290					7,400		8,700	2,290	4,700 4,200			7,200
36	Soso(farm pond)	Otsutsumi	Naraha Town												6,200		19,300	13,200	7,200		9,700	1,450	
37	Iwaki(farm pond)	Shinike			310		540		830	510					1,780	500		132					
38	Kodama Dam Reserv	voir (Lake Kodama)					1,360		600	1,710						2,280	213	3,200	960		4,000	3,800	
39	Iwaki (farm pond)	Kanoritsutsumishita	Iwaki City		600		4,000		820	1,200					48	2,800		3,600	5,000		990	1,240	
40	Takashiba Dam Rese	ervoir (Lake Takashiba)			1,940		1,430		1,410		1,920					800	1,070	790	690		700	710	
41	Shitoki Dam Reserve	bir			3,000		3,300		6,400		3,300					930	980	1,120	1,310		1,690	1,400	
				total n of sa	umber nples	1,275	Detectio	on times	1,274														
			ations wl	here san	nples we	ere not c	ollected	. The re	sult "No	ot detect	able" is	indic ate	d as "0.'	,									

Table 4.3-22 Detection of radioactive cesium at respective locations (Hamadori, Fukushima Prefecture: lake sediments) (No.2)

		Location]	Lake Se	diment	s/Radio	active (Cesium	(Cs-134	+Cs-1	37)/Co	ncentration(Bq	/kg)(*1))							
No.	Wat	er area	Location						FY2	013												FY2014						_
				4	5		5	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2 3	_
1	Soso (farm pond)	Takei	Shinchi Town			4,3	500	1,280	2,650		3,700		4,400		2,580			5,200	4,800		3,530		2,830		2,740		2,730	_
2	()	Uchizawa	Soma City			3:	50	370	530		340		277		254			390	222		307		213		282		239	
3	Matsugabo Dam (La	ce Utagawa)				42,	000	26,200	20,900		10,800		15,400		16,800			36,900	10,400		17,200		25,100		28,800			
4	Mano Dam				19,800			5,000 17,500	17,200	36,000	25,500	48,000	22,600	32,800	13,900			20,400	27,200	17,600	12,400	41,000	31,700	38,300	21,100	45,000	42,700	
5	Soso (farm pond)	Ainosawa			19,400	43,	000		70,000		22,700		14,200					28,700	33,900		7,200		33,000		3,530			
6	Ganbe Dam Reservo	r	Iitate Village		106,000	106	,000		78,000		50,000		87,000					77,000	71,000		71,000		36,800		32,800			
7	Soso	Fugane Dam			2,540	41,	000		32,000		4,100		19,900		30,900			17,800	26,900		3,610		33,000		22,400		14,100	-
8	(farm pond)	Sasatoge			8,200	1,0	030		7,500		5,100		6,600					1,090	2,960		3,090		3,390		980			-
9	Takanokura Dam Re	servoir				7.3	\$00	9,800	13.200		960		26.800		23 400			27.200	33,900		35.100		24 200		35 200			-
10	Valations Down Bar					72	000	29.300	12,500		24.200		12,200					22,000	11.900		24 700		25 700		48,000		22.200	-
	Tokokawa Dalii Kesi	2 VOI				72,	000	29,300	12,300		24,500		12,500					22,900	11,900		54,700		55,700		48,000		32,200	_
11		Tarayachi	Minamisoma City																									_
12		Takeshiyachi				550	1,180		600		410		520		600			1,240	294		293		1,080		265		225	_
13		Ryugasaku				26,600	6,600		6,600		7,400		8,000		36,000			3,670	16,300		1,590		2,410		4,140		15,600	
14	Soso (farm pond)	Uwatashiro	Kawamata Town		380	1,0)60		780		311		140					165	193		190		226		660			
15		Koakuto	Namie Town		61,000	51,	000		14,600		12,500		40,000					3,260	16,300		1,530		8,900		10,300			
16		Yosouchi	Iitate Village		520	84,	000		20,700		3,030		8,900					11,300	4,000		25,300		17,300		7,300		13,000	٦
17		Myobusaku No. 2	Minamisoma City			10,800	1,750		6,400		11,800		14,000		4,000			4,900	6,800		4,080		3,760		2,460		5,000	
18	Ogaki Dam		Namie Town		8,100	2,8	300	4,500	9,300	8,300	13,100	11,000	9,300	10,000					6,000	10,100	6,800	6,100	740	8,900	2,440	3,090		
19		Uenokawa	Katsurao Village		1,100	3,0	600		6,400		2,420		3,050					2,580	2,450		2,030		1,070		810		710	-
20		Heigoiri	litate Village		9.900	31	000		39.000		9.400		52.000					4 200	12.600		1.910		7 700		10.800			-
20	Soso (farm pond)	Mahammana Na 2	nuite vininge		14 200	17	400		9 200		6 200		52,000					10.000	9.700		0,700		6,500		16,000		8 200	-
21		Mekurasawa No. 2	Namie Town		14,000	17,	100		8,500		0,500		3,200					10,000	5,700		9,700		0,500		10,800		8,300	_
22		Joroku			62,000	93,	000		74,000		43,000		89,000					16,000	64,000		79,000		25,600		110,000		58,000	_
23	Furumichigawa Pow	er Plant Dam	Tamura City		9,800			9,900	10,000		3,200		2,980		3,100			1,620	2,830		3,750		87		161			_
24	Soso(farm pond)	Sawairi No. 1	Futaba Town		254,000	460	,000		279,000		302,000		450,000		266,000			20,500	121,000		46,000		74,000		263,000		297,000	
25		Suzunai No. 4	Okuma Town		88,000	32,	000		27,700		123,000		92,000		102,000			31,600	88,000		114,000		108,000		72,000		55,000	
26		Nishihaguro	Futaba Town		15,100	63,	000		39,000		18,500		17,100		18,200			13,800	31,000		22,600		17,200		12,900		28,300	
27	Sakashita Dam					17,700	25,000	20,700	350		18,800		15,300					7,200	14,800		14,700		2,600		17,100		14,300	
28	Soso	Atamamori 2	Okuma Town		5,700	3,9	00		7,000		4,900		4,500					4,100	4,200		1,160		6,300		3,470		3,620	
29	(farm pond)	Yonomori	Tomioka Town			47,	000	50,000	42,000		36,000		48,000		53,000			41,000	39,000		39,900		31,600		32,800		30,900	
30	Takikawa Dam		Kawauchi Village		990	1.3	20	4,700	2.320	30,400	17.300	2.130	930	25,500	11.800			11.900	1.740	16.300	27.100	10.200	23.900	30,400	21.000	21,900	7.400	-
31		Takinocawa	Tomioka Town			4 100	2.060	,	7.400	,	10.500	,	7 800	.,	,			7 500	8.600	.,	9.300	.,	4 800		7.600	,	7.900	-
20	Soco(farm1)	Kaminingale N. 1				16.000	2,000		22.400		11,000		10,000					2.040	500		11.000		2,270		62 000		2 900	-
32	Soso(rarm pond)	namisigeoka ino. 1	Naraha Town			10,000	9,800		23,400		11,000		10,000					2,940	390		11,800		2,370		03,000		3,690	-
33		Shimoshigeoka				4,900	2,660		14,600		9,500		7,900		5,100			7,600	7,600		2,410		5,300		2,600		7,100	_
34	Komachi Dam		Ono Town			3,	00	2,790	6,300		2,860		3,700		4,800				3,320 3,650		1,880		3,100		1,690			
35	Kido Dam		Naraha Town			16,	200	14,800 4,200	820	3,900	14,300	5,400	16,800	13,300				9,500	10,300	18,700	12,500	14,600	12,200	16,000	15,700	14,400	10,800	
36	Soso(farm pond)	Otsutsumi				5,700	1,470		10,500		6,500		7,100					3,650	4,500		2,390		2,370		1,840		5,300	
37	Iwaki(farm pond)	Shinike				8	9	78	112		68		111		750			18	141		380		610				304	
38	Kodama Dam Reserv	oir (Lake Kodama)				1,3	40	2,020	1,730		1,770		2,300		1,740			2,340	3,190		2,520		2,790		1,290		1,480	٦
39	Iwaki (farm pond)	Kanoritsutsumishita	Iwaki City			1	70	500	510		82		730		1,310			32	92		53		80		150		140	٦
40	Takashiba Dam Rese	rvoir (Lake Takashiba)			790			870	880		1,050		1,530		1,140			1,050	860		720		780		950		990	٦
41	Shitoki Dam Reservo	ir			1,820			1,120	1,200		1,270		2,000		1,340			1,230	900		1,110		1,200		1,220		1,130	-
				*1. DI	ak galle	ara loo -		ara camrles a	,	llagter	The	.h. 1987	datent		diante '	ar 40.2		,			,,		,===		,		,	-
				1. Blai	ik cells a	a e iocal	JUS WI	cic samples wer	C not co	nected.	rue res	aa not	actectal	AC IS II	nucated	as U.												

Table 4.3-22 Detection of radioactive cesium at respective locations (Hamadori, Fukushima Prefecture: lake sediments) (No.3)

		Location									Lake Sed	liments/	Rad	ioactive C	esium	(Cs-13	34 + C	s-137)/	Conce	ntration	n(Bq/kg)	(*1)									Average of		coefficient	
No.	Wat	ter area	Location						FY201	5		_	_		_	_							FY2	2016					_	Changes	FY2016 (*2)	No.	of	Trends (*3)
				4	5	6	7	8 9		10		11	-	12 1	2	2 :	3	4	5	6	7	8	9	10	11	12	1	2	3	1.0.1	(2)	\square	THE BRIDGE	
1	Soso (form mond)	Takei	Shinchi Town			2,530 1,750		1,810		2,330)	_	2,	650	2,1	90	_		1,300	1,980		1,970		5,510		2,340		2,450		_MM^~~^A	2,592	1	0.59	1004
2	(rarm pond)	Uchizawa	Soma City			139 540		250		1,060)		4	46	65	50			600	432		910		1,500		1,270		970		1 mont	947	2	0.83	
3	Matsugabo Dam (Lal	ke Utagawa)				16,900 31,400)	11,700		15,000	D		11	,100	14,8	800			20,300	16,600		9,300		23,400		8,500				Jum	15,620	3	0.63	\sim
4	Mano Dam					38,400 17,800	12,000	49,000	24,900 47	,200 29	9,700 38,10	0 32,10	40	,800 90,00	0 35,6	600			26,000	46,700	22,900	60,500	29,300	78,000	33,900	56,300	16,300	46,500		Manuald	41,640	4	0.60	~
5	Soso (farm pond)	Ainosawa			10,400	334		8,400	13,600 16	,200 6,	,700		49	,500					76,000	30,100		2,810		5,910		66,800				Land	36,324	5	0.94	$\wedge \wedge \wedge$
6	Ganbe Dam Reservoi	ér	litate Village			55,000 60,000)	65,000	54,000 73	,000 64	4,000		26	,100					58,000	51,200		42,700		54,400		92,000				Sww	59,660	6	0.48	~~~*
7	Soso	Fugane Dam			1,930	17,500		20,100	10,300 10	,100 11	,200		6,	100	34,2	200			4,870	15,600		20,100		4,630		8,600		3,450		MAR	9,542	7	0.66	$\mathcal{N}\mathcal{N}$
8	(farm pond)	Sasatoge			1,920	670		384	650 1,	,610 4	455		4	77					880	680		1,080		1,860		746				Maria	1,049	8	0.90	
9	Takanokura Dam Re	servoir			20,400	22,800		19,200	28,700 26	i,400 32	2,400		29	,800	20,8	800			5,590	22,900		22,700		30,700		17,600		18,800		UM	19,715	9	0.44	~~~*
10	Yokokawa Dam Rese	ervoir			1,240	8,500		27,500	43,400 34	,300 35	5,900		19	,500	24,5	500			24,000	44,100		15,500		16,300		16,400		11,600		1	21,317	10	0.88	$\Lambda\Lambda\Lambda$
11		Taravachi	Minamisoma City		4.040	1.180		770	3,760 5.	500 2.	.700		4.	100	4.8	60			3,540	5,000		660		2,460		1.020		1.950		L	2.438	11	1.02	<u> </u>
12		Takechinachi			820	466		247	49 3	343	34		1 7	58	11			_	218	639		0		1,160		125		459		VIII	434	12	0.75	/
12		n			000	1 200		17.00	2.000	200 6	200	-		500			-	_	12,200	15 500		2.040		6,700		0.400				Lil	0.555		0.07	
13	Soso	Kyugasaku			900	1,370		17,400	3,330 0,	300 0,	,300		14	,500	10,8	000			15,200	15,500		3,040		0,780		0,400		4,410		1	8,555	13	0.97	/vv•
14	(farm pond)	Owatasniro	Kawamata 10wn			402 1,270		1,840		349		-		10		-			10	61		12		82		118				14. 1	70	14	1.00	
15		Koakuto	Namie Town		5,000	4,690		6,300		8,900)	_	6,	600				-	22,500	7,100		8,600		6,470		49,900				WVm-1	18,914	15	0.96	////
16		Yosouchi	litate Village		3,430	2,660		2,010	5,070 8,	600 12	2,500	-	9,	000					4,970	4,010		11,700		1,060		1,100				Vm	4,568	16	1.28	
17		Myobusaku No. 2	Minamisoma City		2,010	1,510		1,840	1,360	:94 1,	,360		3,	150	1,0	160			1,650	2,600		2,820		2,530		3,900		1,160		Whin	2,443	17	0.86	////
18	Ogaki Dam	-	Namie Town		6,300	25,300	2,890	1,400		5,500)	107,00	26	,900 14,70	18,5	500			6,600	85,000	17,900	13,100	23,600	4,830	4,110	29,400	32,600	3,950		han	22,109	18	1.88	\sim
19		Uenokawa	Katsurao Village			500 620		252		525			3	35	65	90			502	517		286		233		114		212		h	311	19	1.98	>
20	Soso	Heigoiri	litate Village			7,600 5,000		28,700	44,500 41	,300 38	3,700		6,	000					2,290	6,500		22,600		3,980		9,200				Mr	8,914	20	0.88	\sim
21	(farm pond)	Mekurasawa No. 2			10,800	20,100		5,300		10,700	D		5,	500	21,8	800			5,680	5,430		3,520		2,000		2,200		3,220		~~M	3,675	21	0.54	\searrow
22		Joroku	Name 10wn		41,100	53,000		223,000		439,00	10		14:	5,000	217,	,000			155,000	188,000		316,000		24,000		11,700		7,610		M	117,052	22	1.00	\sim
23	Furumichigawa Pow	er Plant Dam	Tamura City			2,980 2,830		860		98			3	36	1,3	320			1,790	365		690		759		592		910		T.	851	23	1.08	/
24	Soso(farm pond)	Sawairi No. 1	Futaba Town		437,000	920,000		660,000		212,00	10		610),000	540,	,000			254,000	528,000		213,000		306,000		68,000		197,000		m.M.	261,000	24	0.64	\sim
25		Suzunai No. 4	Okuma Town			94,000 79,000)	80,000		43,800	D		81	,000	88,0	000			76,000	81,000			76,000	93,000		103,000		61,500		NWW	81,750	25	0.32	~~~
26		Nishihaguro	Futaba Town		6,600	7,600		3,730		5,400)		22	,200	25,5	500			7,200	9,300		1,880		14,100		10,100		13,700		Maria	9,380	26	0.89	$\overline{)}$
27	Sakashita Dam				19,600	13,800		14.800		17,500	D		19	.800	9.5	600			12.200	17.900		14,300		7.600		12,100		4,670		1	11.462	27	0.67	$\overline{}$
28		Atamamori 2	Okuma Town		1.280	730		910		1.610)		2	02	2.0	130			244	3 670		269		1.020		1 370		4 240		the	1 802	28	0.78	×
29	(farm pond)	Yonomori	Tomioka Town		12 700	8 200		35 200		9.200)		12	400	19.6	600			16 900	20.400		9 400		15 300		14 100		13 900		www.	15 000	29	0.50	~
20	T 13	1 GHOMBAT	Konstanti artis		0.400	1 700	10,100	25,000 1,700		6 200	, ,	6.200		200 5 70		500			10,000	0,400	11.200	1,000	2.640	2.100	7.100	2,220	3 000	6.100		1	0.767	20	1.07	~
30	i akacawa Dam		Kawauchi viitage		9,400	680	40,400	23,000 4,760		1,700	, ,	0,200	0,	300 5,70	. 19,3	5.00	+	-	34,900	2,400	11,300	+,8/0	3,040	3,100	7,100	3,220	3,890	0,190		MAN	8,707	30	0.72	/
51		a akinosawa	i omioka i own	-	2,930	080		2,700		1,780		+	8	und .	3,0	10	+		∠,000	2,470		351	-	2,120	-	1,280	-	1,510	-	111	1,720	51	0.72	
52	soso(tarm pond)	Kamisigeoka No. 1	Naraha Town		14,100	11,700	-	2,520		6,300	,	+	7,	400	10,3	500	+	_	13,100	9,800		16,500	-	16,500		17,400		13,900		huh	14,533	52	1.07	1/1/1
33		Shimoshigeoka			14,000	2,600	-	1,600		650		-	9,	700	10,7	700	+		14,200	8,600		2,370		1,850		8,900		4,630		han	6,758	33	1.28	>
34	Komachi Dam		Ono Town			1,200 1,600	<u> </u>	2,320		2,160)	-	4	48	_				142	1,140		1,800		1,610		1,880				1 mar	1,314	34	0.71	
35	Kido Dam	12,900 15,500 17,800 13,600)	10,10) 8,	700 9,40	D				9,900	11,800	10,000	14,400	9,800	8,700	8,500	7,280	4,130	6,980		Mond	9,149	35	0.47	~~~*
36	Soso(farm pond)	m pond) Otsutsumi 2,280 1,870 1,200)		4,	890	4,8	890			4,280	4,290		6,060		2,840		4,390		5,220		how	4,513	36	0.72	>
37	Iwaki(farm pond)	ki(farm pond) Shinike 241 288 139											2	57	37	77			145	143		234		259				110		Ann	178	37	1.04	\searrow
38	Kodama Dam Reserv	oir (Lake Kodama)				2,430 1,040		2,120		750			6	70	67	79			565	640		890		800		711		1,720		Am	888	38	0.58	\searrow
39	Iwaki (farm pond)	Kanoritsutsumishita	Iwaki City			640 1,730		4,700		172			2,	240	1,2	200			860	640		760		548		129		243		Much	530	39	1.22	\mathbb{N}
40	Takashiba Dam Rese	ervoir (Lake Takashiba)				780 1,010		700		900			7	10	90	00	T		930	730		754		1,490		850		652		1 million	901	40	0.34	\searrow
41	Shitoki Dam Reservo)ir				1,460 1,310		1,960		1,590)		1,	980	1,5	510			1,320	1,650		1,770		1,400		840		1,170		1	1,358	41	0.62	\searrow
				*1: Blar	nk cells :	are locations w	here sam	ples were not c	ollected. Th	ie result	"Not detec	table" is	indic	ated as "0	-										A	в	с	D	Е		20,238	Average		
				*2: Arit	hmetic /	Average; calcul	ated by a	ssuming ND=0	; Color cod	es show	categories	(see the	righ	t).																•		لـــــــ	•	
				*3: Res	ults of t	- he analysis of t	rends at	respective locat	ions using t	he meth	- od explaine	d on 4.3	1)2)	>	Dec	reasing	-	≯ In	creasin	g ~	⊶ Un	changed		M Flux	tuations									
				*3: Res	ults of the	he analysis of t	rends at	respective locat	ions using t	he methe	od explaine	d on 4.3	1)2)	1	Dec	reasing	-	≯ In	creasin	g ~	∼ Un	changed	a ^		tuations									

(ii) Nakadori

In Nakadori, Fukushima Prefecture, surveys were conducted 27 to 46 times from September 2011 to February 2017 for lake sediment samples collected at 12 locations.

Regarding the concentration levels of detected values, four locations were categorized into Category C, five locations into Category D, and three locations into Category E (see Table 4.3-23 and Table 4.3-24).

Concentration levels were generally decreasing at five locations, were unchanged at two locations, and fluctuating at five locations.

Table 4.3-23 Categorizations of detected values at respective locations

(N	lakadori	, Fukushima	Prefecture:	lake sec	liments)
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Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	4	No. 42, No. 47, No. 52, No. 53
D	Upper 25 to 50 percentile	5	No. 43, No. 45, No. 49, No. 50, No. 51
Е	Upper 50 to 100 percentile (lower 50%)	3	No. 44, No. 46, No. 48





Figure 4.3-13 Changes in concentration levels over the years at respective locations (Nakadori, Fukushima Prefecture: lake sediments)

	Location			/Radio	active	Cesiu	n (Cs-	134+	Cs-137)/Conc	entrat	ion(Bo	/kg)(*	1)								
No	Water area	Location				FY20)11									FY2	2012					
INO.	water area	Location	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
42	Surikamigawa Dam Reservoir	Fukushima City		2,300		570		104	116					2,580		2,600	1,600	2,020		4,500	3,600	
43	Lake Handanuma (farm pond)	Kori Town		3,800		21,900		35,000						1,050		8,800	7,400	6,900	24,900			
44	Oike Pond (farm pond)	Motomiya City		2,400		4,000		1,320	1,340					2,110	680		4,500	2,070	1,840		1,380	
45	Miharu Dam	Miharu Town		69		0		7,500						3,700	4,400		6,800	3,100	4,800			
46	Hounokusa (farm pond)	Koriyama City		1,140		400		2,100		1,700					1,450		3,700			4,000		
47	Lake Hatori	Tenei Village		2,060		2,240									1,950		1,270	3,700				
48	Hirodaira (farm pond)	Sukagawa City		290		570		119		191				139	133		148	217		340	163	
49	Sengosawa Dam Reservoir	Ishikawa Town		300		1,240		17							2,700		1,740	3,800	720			
50	Watariike Pond (farm pond)	Yabuki Town		102		550		2,800		17				63	144		360	4,100		222		
51	Izumikawa (farm pond)	Shirakawa City		11,300		14,200		5,800		660				720	820		8,900	710		1,270	940	
52	Hokkawa Dam	Nishigo Village		1,920		6,800		1,210							5,100		13,300	3,600	4,600			13,200
53	Lake Nanko	Shirakawa City		900		1,980		10,500		3,200					580		820	7,100				2,300
			total n of sa	umber mples	402	Dete tim	ction nes	399														
			*1: Blar	nk cells	are loc	ations v	where	samples	were	not col	lected.	The re	sult "N	ot dete	ctable"	is indi	cated a	s "0."				

Table 4.3-24 Detection of radioactive cesium at respective locations (Nakadori, Fukushima Prefecture: lake sediments) (No.1)

	Location									Lake	Sedim	ents/R	adioac	tive C	esium	(Cs-13	4+Cs	-137)/0	Concentration	n(Bq/k	g)(*1)							
No	Water gras	Location							FY2	013											J	FY2014	1					
INO.	water area	Location	4	5	(5		7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
42	Surikamigawa Dam Reservoir	Fukushima City			3,4	400	2,4	470	2,720		2,560		4,700		4,800			2,750	3,220		2,690		2,820		4,250		2,700	
43	Lake Handanuma (farm pond)	Kori Town			930	890	1,2	260	2,770	520	4,500	790	1,400	630				1,190	920	317	257	500	346	216	233	437	176	
44	Oike Pond (farm pond)	Motomiya City			960	5,700			470		620		1,220		630			3,280	470		730		71		85		226	
45	Miharu Dam	Miharu Town			4,8	300	4,600	4,800	6,500	6,500	3,500	3,600	4,500	3,700				2,880	3,040	2,310	2,410	1,990	2,580	2,440	1,960	1,740		
46	Hounokusa (farm pond)	Koriyama City			1,460	92			83		88		510	1,400				3,900	3,640		18		0		13	710		
47	Lake Hatori	Tenei Village			2,2	210	2,7	750	2,630		5,000		3,700						2,340 1,440			4,200	6,400		2,080			
48	Hirodaira (farm pond)	Sukagawa City			88	75			106		69		340	179				104	16		0		159		351	107		
49	Sengosawa Dam Reservoir	Ishikawa Town			1,7	740	2,0	570	7,300		2,620		2,830	2,370				4,500	3,500		6,200		4,700		3,140			
50	Watariike Pond (farm pond)	Yabuki Town			75	99			202		88		68	107				1,280	1,300			1,570	1,210		640	1,540		
51	Izumikawa (farm pond)	Shirakawa City			3,200	1,770			540		5,400		3,000	1,200				1,880	326			670	3,890		3,860	780		
52	Hokkawa Dam	Nishigo Village			3,4	100	11,	100	8,500		2,970		7,600	2,180				1,480	3,900		4,400		6,600		3,480	2,990		
53	Lake Nanko	Shirakawa City			8,600	6,800			4,300		5,900		2,870	9,100				970	6,400		10,900		840		7,400			
			*1: Bla	nk cell	s are lo	cations	s where	e sampl	es wer	e not c	ollected	I. The	result "	Not de	tectable	e" is in	lic ated	as "0.'	,									

Table 4.3-24 Detection of radioactive cesium at respective locations	3
(Nakadori, Fukushima Prefecture: lake sediments) (No.2)	

	Location									Lak	e Sedin	nents/	Radioa	ctive	Cesiur	n (Cs-	134+0	Cs-137	/Conc	entrati	on(Bq	/kg)(*1	l)						Average of		coefficient	
No.	Water area	Location						1	FY201	5											FY	2016						Changes	FY2016	No.	of	Trends (*3)
			4	5		6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		(*2)		variation	
42	Surikamigawa Dam Reservoir	Fukushima City			4,020	3,090		1,990		3,140		2,280					2,620	1,660		3,150		4,070		2,060				Vhr Wh	2,712	42	0.43	~~~*
43	Lake Handanuma (farm pond)	Kori Town			2,780	520	1,170	335	464	529	600	810		950			356	970	760	1,110	663	728	656	395				M	705	43	2.18	1
44	Oike Pond (farm pond)	Motomiya City		1,020	1,	730		1,000		680		610		479			420	403		548		433		613		430		When	475	44	1.00	~
45	Miharu Dam	Miharu Town			2,070	3,770	1,480	1,710	1,340	1,260	1,450	1,910	2,770	1,570			1,420	1,390	2,000	1,750	1,530	2,830	1,400	2,180	2,600	1,480		Mhun	1,858	45	0.60	/
46	Hounokusa (farm pond)	Koriyama City		123	4	81		68		454		44		107			40	92		23		51		83		246		M	89	46	1.43	/
47	Lake Hatori	Hatori Tenei Village 1.900 3.070 4.080 1.810 3.750 2.640 3.570 3.620 3.510 6.640 2.020 2.120														-nMml	3,580	47	0.45	~~~*												
48	Hirodaira (farm pond)	Intern Lote + mage Lote + mage <thlote+ mage<="" th=""> <thlote+ mage<="" th=""> <thlot< td=""><td>Limm</td><td>198</td><td>48</td><td>0.64</td><td>$\wedge \! \wedge \! \wedge$</td></thlot<></thlote+></thlote+>														Limm	198	48	0.64	$\wedge \! \wedge \! \wedge$												
49	Sengosawa Dam Reservoir	Ishikawa Town			1,200	3,640		2,160		1,620		1,450	1,450				1,310	1,090		1,660		970		850				m	1,176	49	0.71	$\wedge \! \wedge \! \wedge$
50	Watariike Pond (farm pond)	Yabuki Town			1,200	1,260		1,160		1,420		1,800	1,330				1,290	1,160		1,390		1,530		1,330				Nm	1,340	50	0.91	$\wedge \! \wedge \! \wedge$
51	Izumikawa (farm pond)	Shirakawa City			870	1,390		153		2,850		552	2,300				1,310	1,550		527		850		190				Umm	885	51	1.28	/
52	Hokkawa Dam	Nishigo Village			2,570	2,450		5,800		5,080		4,050	4,580				7,000	7,700		6,970		6,420		3,130				Mur	6,244	52	0.59	$\wedge \! \wedge \! \wedge$
53	Lake Nanko	Shirakawa City			6,200	3,320		3,730		3,770		4,250	3,870				4,590	5,190		3,060		2,430		5,430				WMm-	4,140	53	0.63	$\wedge \! \wedge \! \wedge$
		*1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0." A B C D E 1,950 Average																														
			*2: A	ithmeti	c Aver	age; cal	kulated	l by as:	suming	ND=0	; Color	codes	show c	ategor	ies (se	e the ri	ght).															
			*3: Re	esults o	f the a	nalysis	of tren	ds at re	spectiv	e locat	ions us	ing the	metho	i expla	ined or	4.3(1) 2)		⇒ D	ecreasin	g -	≯ Inc	reasing	~	🔶 Unc	hanged	^	M Fluctuations				

(iii) Aizu

In Aizu, Fukushima Prefecture, surveys were conducted 18 to 50 times from September 2011 to February 2017 for lake sediment samples collected at 31 locations.

Regarding the concentration levels of detected values, seven locations were categorized into Category C, two locations were categorized into Category D and 22 locations were categorized into Category E (see Table 4.3-25 and Table 4.3-26).

Concentration levels were generally decreasing at eight locations, unchanged at four locations, fluctuating at 13 locations, and increasing at six locations.

Table 4.3-25 Categorizations of detected values at respective locations
(Aizu, Fukushima Prefecture: lake sediments)

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	7	No. 55, No. 56, No. 57, No. 58, No. 59, No. 60, No. 74
D	Upper 25 to 50 percentile	2	No. 54, No. 78
Е	Upper 50 to 100 percentile (lower 50%)	22	No. 61, No. 62, No. 63, No. 64, No. 65, No. 66, No. 67, No. 68, No. 69, No. 70, No. 71, No. 72, No. 73, No. 75, No. 76, No. 77, No. 79, No. 80, No. 81, No. 82, No. 83, No. 84





Table 4.3-26 Detection of radioactive cesium at respective locations

		Location						L	ike Sed	liments	/Radioa	active (Cesium	(Cs-13	4+Cs-	137)/Co	ncentra	ation(B	q/kg)(*	[;] 1)				
No.		Water area	Location				FY2	.011]	FY2012	2					
				8	9	10	11	12	1	2	3	4	5	6	7	8	9	1	0	11	12	1	2	3
54	Nicchu Dam		Kitakata City		298		1,380									2,270	970	1,1	.90	2,220				
55	Lake Sohara				380		196											530	2,180	590				1
56	Lake Hibara		Kitashiobara Village		630		480											1,420	1,060	1,250	2,750			
57	Lake Onogawa					270	57											1,870	111	980	780			
58	Lake Akimoto		Inawashiro Town		440		2,020											1,760	177	540	219			
59	Lake Bishamonn	uma	Kitashiobara		150		0											1,260	3,900	2,260				
60	Lake Oguninuma	L	Village		1,330		1,670											2,370	10,200	310				1
61	Aizu(farm pond)	Lake Onuma	Nishiaizu Town		61		28								720	510		60)0	720				
62		Center	Aizuwakamatsu City		0		0		44		93						286	13	33	76	33	126		122
63		Takahashi River Estuary															86	15	54	270	166	128		284
64		Oguro River Estuary															200	7	6	179	114	127		245
65		Tenjinhama Beach	Inawashiro Town														111	11	10	99	132	135		
66	1	Hishinuma River Estuary															83	10)8	39	96	89		68
67	Lake	Intake of Asakasosui															126	11	18	115	251	108		116
68	Inawashiro	Hamajihama Beach															235	20)3	240	169	242		221
69		Funatsu Port	Koriyama City														223	21	13	186	370	182		223
70	1	Offshore of Funatsu River Estuary	Konyania City														74	8	.6	118	800	186		116
71		Seishogahama Beach															220	47	70	440	460	560		610
72		Haragawa River Estuary	Aizuwakamatsu City														390	15	51	168	215	2,560		610
73		Koishigahama Floodgate	Inawashiro Town														206	2	.2	161	209	263		306
74	Higashiyama Dar	n Reservoir	Aizuwakamatsu City		157		290		1,230							220		2,2	250	490				1
75		Center			100		59		63		84					160		13	38	2,210	120			1
76	Lake Numazawa	Midpoint between the center of the lake and off the estuary	Kaneyama Town																					1
77		Offshore of Maenosawa River Estuary																						1
78	Aizu (farm pond)	Aizumisato Town		510		1,640								310	1,330		1,9	<i>i</i> 10	3,200				
79	Okawa Dam Res	ervoir	Aizuwakamatsu City		1,450		1,120		1,320		830					218		61	10	242	35	44	69	
80	Tagokura Reserv	voir	Todomi Tourn			90										229								
81	Minamiaizu (farm pond)	Fukui	Tadami Town		22		47								0	0		27	70	0				
82	Tajima Dam Res	ervoir (Lake Funehana)	Minamiaizu Town		410		0		177		34					207		27	70	700				
83	Okutadami Reser	rvoir	Tadami Town		980		18									97		19) 0					
84	Lake Ozenuma		Hinoemata Village			0										310	430	3	4					
				total n of sar	umber nples	911	Deteo tirr	ction nes	887															
				*1: Blar	nk cells	are loca	ations w	here sa	mples w	vere not	collecto	ed. The	result "	Not det	ectable"	is indic	ated as	"0."						

(Aizu, Fukushima Prefecture: lake sediments) (No.1)

Table 4.3-26 Detection of radioactive cesium at respective locations (Aizu, Fukushima Prefecture: lake sediments) (No.2)

		Location								Lake	Sedim	ents/Ra	dioactiv	e Cesi	um (Cs	-134+	Cs-137	/Conce	ntratio	n(Bq/k	g)(*1)							
No.		Water area	Location		1	1				FY2013											1	FY2014						
54	Niaahu Dam		Kadada Cita	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	,	10	11	12	1	2	3
54	Leke Sohere		Kitakata City		970	1,630		1,140		050		1,590					1,930	1,490		1,990			43					
55	Lake Johana		Kitashiobara		000	050	242	1,040	850	570	540	1.470					1,440	2,450	107	272	16		2,500	2 200	1.600			
50	Lake Onoone		Village		520	1,220	342	1,740	850	210	540	1,470					1,040	287	196	3/3	15	2	2.540	2,300	1,390			
57	Lake Oliogawa				550	490	380	870	80	1.270	1,040	282					1,220	309	108	97	0.	40	2,540	1,550	1,720			
58	Lake Akimoto		Inawashiro 1 own		214	2,010	1,340	380	1,580	1,270	2,300	450					1,200	3,440	590	850	2,3	40	3,150	1,710	257			
59	Lake Bisnamon	numa	Kitashiobara Village		82	15,400	(20)	570		3,370							1,620	400	0.070	140			11					
60	Lake Oguninum Aizu(farm	na	-			198	620	3,250		1,300								4,100	2,670	1,180			2,240					
61	pond)	Lake Onuma	Nishiaizu Town Aizuwakamatsu		2,740	59		480		740		1,230					930	129		620			385				\vdash	
62	-	Center	City		190	178	229	86	103	215	99	237	256	199			149	29	114	63	31	9	97	119	194	67	193	
63	-	Takahashi River Estuary	+		171	300		130		147		153	139				261	291		142			233		195	98	\vdash	
64	-	Oguro River Estuary	-		110	84		163		130		114	126				90	99		95			96		110	88		ļ
65		Tenjinhama Beach	Inawashiro Town		208	122		80		157		105	83				198	99		106			201		47	148		
66		Hishinuma River Estuary	-		85	50		57		82		60	15				39	47		49			25		47	23		
67	Lake	Intake of Asakasosui			236	249	172	123	241	194	263	216	222	152			182	91	255	247	20	01	160	170	248	440	103	
68	Inawashiro	Hamajihama Beach			194	162		151		205		228					189	189		151			206		213	161		
69		Funatsu Port	Vorinomo Citu		186	141		187		107		138	160				192	382		101			141		224	109		
70		Offshore of Funatsu River Estuary	Konyana City		88	97		107		92		70					87	74		91			278		73	79		
71		Seishogahama Beach	Ī		480	620		211		420		550	470				344	174		387			331		500	490		
72		Haragawa River Estuary	Aizuwakamatsu City		176	590		470		760		830	700				790	520		1,030			740		379	700		
73		Koishigahama Floodgate	Inawashiro Town		241	133	144	134	228	111	133	361	114	195			226	389	303	30	36	i3	109	274	89	257	200	
74	Higashiyama Da	am Reservoir	Aizuwakamatsu City		24	680		880		600		2,110					850	1,990		18			2,000		214			
75		Center			219	90		191		62		221					57	127		58			70		197			
76	Lake Numazawa	Midpoint between the center of the lake and off the estuary	Kaneyama Town		146	1,030		118		77		103					37	1,200		129			74		237			
77		Offshore of Maenosawa River	Ť		144	139		134		79		54					98	118		163			148		163			
78	Aizu (farm pon	d)	Aizumisato Town		3,100	660		540		142		117					640	970		7,800			490					
79	Okawa Dam Re	eservoir	Aizuwakamatsu City		120	297		49		740		286	810				139	344		14			400		298	90		
80	Tagokura Reser	rvoir			360	1,090		410		1,290							700	343		360				378				
81	Minamiaizu (farm pond)	Fukui	Tadami Town		0	70		12		28		39					0	0		0			30					
82	Tajima Dam Re	servoir (Lake Funehana)	Minamiaizu Town	L	175	630		1,000		420		740					550	870		333			980					
83	Okutadami Reso	ervoir	Tadami Town		l	38	24	34	259	160	180							209	236	148	8	6	277	103				
84	Lake Ozenuma		Hinoemata Village			13	202	51	0	242 57								70	160	117	550	122	59					
				*1: Bla	nk cells	are loca	ations w	here sa	mples v	vere not collect	ed. The	result "	Not det	ectable"	'is indic	ated as	"0."											

Table 4.3-26 Detection of radioactive cesium at respective locations (Aizu, Fukushima Prefecture: lake sediments) (No.3)

		Location								I	ake Se	dimen	ts/Radi	oactive	Cesium	(Cs-13	84+Cs	-137)/C	oncent	tration(Bq/kg)(*1)								Average of		coefficient	
No.		Water area	Location				_		FY2015				_	-							FY201	6						Changes	FY2016 (*2)	No.	of	Trends (*3)
				4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		(2)	\square	THE INCOM	
54	Nicchu Dam		Kitakata City			180 2,890		413		530		1,920					1,670	2,360		2,120		1,370						much	1,880	54	0.56	1///4
55	Lake Sohara		Viteshiohore			2,450 3,290		2,440		1,680							1,150	1,640		3,390		6,100						~~~	3,070	55	0.83	/
56	Lake Hibara		Village			1,970 4,540	4,380	2,260	2,380	1,090	3,070	5,080	3,720				2,250	3,430	3,720	4,120	4,120	8,400	1,830	3,880	3,120			mon	3,874	56	0.80	
57	Lake Onogawa					1,530 1,470	2,970	550	2,950	1,930	1,660						2,740	1,260	990	1,870	5,370	2,600	437					month	2,181	57	0.94	~
58	Lake Akimoto		Inawashiro Town			3,190 5,900	1,720	870	830	2,330	4,240						1,940	4,910	15,400	3,110	14,200	4,900	4,960	5,680				l	6,888	58	1.21	~
59	Lake Bishamonr	ama	Kitashiobara			452 2,330		2,310		4,150							2,520	2,420		3,320		2,590						-th-	2,713	59	1.28	\sim
60	Lake Oguninum	1	Village				3,850	3,060	2,860	3,850									7,060	2,210	5,730	1,090						Lon	4,023	60	0.82	$\wedge \wedge \wedge$
61	Aizu(farm pond)	Lake Onuma	Nishiaizu Town		0	17		172		351		0					263	1,260		114		115		148				mi	380	61	1.21	\sim
62		Center	Aizuwakamatsu City		81	159	214	212	372	87	102	156	198	530			199	285	313	267	183	468	177	409	1,260	369		america	393	62	0.95	/
63		Takahashi River Estuary			97	99		86		155		93	141				163	136		100		150		99	133			Mm	130	63	0.40	/
64		Oguro River Estuary	1		75	85		75		89		78	65				76	78		72		73		76	61			When	73	64	0.41	/
65		Tenjinhama Beach	Inawashiro Town		83	71		62		95		39	92				63	73		115		93		53	80			Mm	80	65	0.42	/
66		Hishinuma River Estuary			28	27		28		25		30	45				22	12		27		27		29	35			man	25	66	0.56	/
67	Laka	Intake of Asakasosui			162	211	262	278	156	225	272	211	178	359			238	187	219	227	193	189	138	119	59	129		malin	170	67	0.36	~~~
68	Inawashiro	term term																														
69	awakino Hangduma Bech 175 138 152 149 156 167 177 158 167 177 123 148 17 170 123 148 17 170 123 148 17 170 123 148 17 170 123 148 17 170 123 148 17 170 123 148 17 170 123 148 170 170 123 148 170 170 123 148 170 170 123 148 170 170 123 148 170 170 123 148 170 170 123 148 170 170 123 148 170 170 123 148 170 170 123 148 170 170 123 148 170																															
70	Fundaru Port Fundaru Port 174 146 244 202 221 123 188 177 127 156 105 146 July Wrun 142 69 0.37 ~~~ Offsbore of Fundsu River Bauary 54 273 166 42 22 13 68 22 25 57 31 34 July Wrun 40 70 1.28<																															
71		Offshore of Fundasa River Estanary Kariyama Ciy 54 273 166 42 22 13 68 22 25 57 31 34 J 400 70 1.28 Seishogshuma Beach 370 241 455 374 272 438 469 500 373 418 463 188 1////// 402 71 0.29 ~~~																														
72		$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$																														
72		Kaishiashama Elaadaata	City		220	103	211	225	190	121	205	210	246	256			121	190	112	102	189	242	224	170	224	149		Allend	204	72	0.41	////
73	Uiseshiromo De	n Bacamoir	Aizuwakamatsu		223		211	1.000	170	121	205	219	240	230			1.51	109	112	170	107	2.42	334	170	324	140		Verland	2.170	75	0.41	~~~~
74	ngasinyama Da	in Reservoir	City			520 1,870		1,880		1,300			/90				2,230	3,800		870		3,330		619				Mr.Mr.M	2,170	74	0.84	<u> </u>
75	Lake	Center Midpoint between the center of			1,540	372		45		60		537					/30	2/9		5/		358		/4				-hulu	300	75	1.63	////
76	Numazawa	the lake and off the estuary Offshore of Maenosawa River	Kaneyama Town		550	130		101		265		100					443	94		207		135		627				Www.	301	76	1.12	////
77		Estuary			131	53		72		26		15					161	149		216		141		179				VV.	169	77	0.45	~~~*
78	Aizu (farm pond	0	Aizumisato Town		41	79		870		308		327	12,300				517	259		1,650		218		137				~~~	556	78	1.77	$\mathcal{N}\mathcal{N}$
79	Okawa Dam Re	servoir	City			526 218		350		124		89					75	95		95		54		70	68			mm	76	79	1.12	/
80	Tagokura Reser	voir	Tadami Town		303	760		351			310						289	247		395			241					he	293	80	0.69	\sim
81	Minamiaizu (farm pond)	Fukui			0	0		0		10		0					0	0		0		0		0				han	0	81	2.61	\sim
82	Tajima Dam Re	ervoir (Lake Funehana)	Minamiaizu Town		260	384		134		404							347	576		179		146		524				WWW-	354	82	0.67	\mathbb{N}
83	Okutadami Rese	rvoir	Tadami Town			71	140	131	109	154	203							31	25	184	146	172	133					Low	115	83	1.09	\sim
84	Lake Ozenuma		Hinoemata Village			112	70	160	1,160 1,380	670								130	361	276	75 345	284						rul	245	84	1.24	\mathbb{N}
				*1: Bla	ink cells	are locations	where sa	imples v	vere not collect	ed. The	result "	Not det	ectable'	'is indic	ated as	···0.''							A	в	с	D	Е		1,021	Average		
				*2: Ari	ithmetic	Average; calc	alated by	/ assumi	ing ND=0; Cold	r codes	show c	ategori	es (see	the righ	.).								-					•				
	*3: Results of the analysis of trends at respective locations using the method explained ons.3(1) 2) 🍅 Decreasing 🧼 Increasing 🛶 Unchanged 👭 Hactuations																															
										-																						

3) Ibaraki Prefecture

In Ibaraki Prefecture, surveys were conducted 13 to 22 times from September 2011 to February 2017 for lake sediment samples collected at 19 locations.

Regarding the concentration levels of detected values, one location was categorized into Category C, five locations into Category D, and 13 locations into Category E (see Table 4.3-27 and Table 4.3-28).

Concentration levels were generally decreasing at nine locations, unchanged at six locations, and fluctuating at four locations.

Table 4.3-27 Categorizations of detected values at respective locations

(Ibaraki Prefecture:	lake sediments)
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Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	1	No. 13
D	Upper 25 to 50 percentile	5	No. 12, No. 14, No. 15, No. 16, No. 17
Е	Upper 50 to 100 percentile (lower 50%)	13	No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 7, No. 8, No. 9, No. 10, No. 11, No. 18, No. 19



Figure 4.3-15 Changes in concentration levels over the years at respective locations (Ibaraki Prefecture: lake sediments)

		Location					Lak	e Sedin	nents/	Radio	octive	Cesiu	n (Cs-	134+	Cs-137)/Con	centra	tion(B	q/kg)(*1)			
No	Wate	ar area	Location				FY2	011									FY2	012					
140.	Wat	. area	Location	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		Hiroura			320					260				200			122			219		219	
2	Hinuma	Miyamae	Ibaraki Town		37					162				179			98			118		184	
3		Oyazawa			670					420				550			810			690		610	
4		Offshore of Tamatsukuri	Namegata City		330					1,300				228			201			370		890	
5		Offshore of Kakeuma	Ami Town		340					440				610			430			252		270	
6	Lake Kasumigaura	Center	Miho Village		221					900				178			151			630		310	
7		Offshore of Aso	Inashiki City		330					250				183			202			186		183	
8	I. J. 1774	Offshore of Kamaya	Namegata City		90					1,000				510			520			239		610	
9	Lake Kitaura	Jingu Bridge			220					217				106			103			93		95	
10	IF I' D'	Lake Sotonasakaura	пако Спу		184					143				110			97			102		93	
11	Hitachitone River	Ikisu	Kamisu City		290					205				168			152			154		142	
12	Lake Ushikunuma	Center of Lake Ushikunuma	Ryugasaki City			1,840				1,020				1,090			1,170			1,210		1,300	
13	Mizunuma Dam		Kitaibaraki City																				
14	Koyama Dam		Takahagi																				
15	Hananuki Dam		City																				
16	Jyuou Dam	Center	Hitachi City																				
17	Ryuji Dam		Hitachiota City																				
18	Fujiigawa Dam		Shirosato Town																				
19	Iida Dam		Kasama City																				
				total n of sa	umber nples	373	Dete tin	ction nes	371														
				*1: Blai	nk cells	are loc	ations	where	sample	es were	not co	ollected	l. The	result '	Not de	tectabl	e" is in	dicated	1 as "0	."			

Table 4.3-28 Detection of radioactive cesium at respective locations (Ibaraki Prefecture: lake sediments) (No.1)

		Location							Lak	e Sedi	ments	/Radio	active	Cesiu	m (Cs	-134+	Cs-13	7)/Con	centra	ation(E	Bq/kg)((*1)					
No	Wate	r 9749	Location						FY2	013											FY2	014					
INO.	wate	a aica	Location	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		Hiroura			221			114			155			165			136			111			136			94	
2	Hinuma	Miyamae	Ibaraki Town		146			49			49			204			119			264			120			119	
3		Oyazawa			570			540			490			490			450			442			460			590	
4		Offshore of Tamatsukuri	Namegata City			650		630			770			640			510			580			540			510	
5		Offshore of Kakeuma	Ami Town			280		320			208			257			165			168			78			182	
6	Lake Kasumigaura	Center	Miho Village			300		880			490			340			242			192			460			360	
7		Offshore of Aso	Inashiki City			150		139			164			138			143			134			139			138	
8		Offshore of Kamaya	Namegata City			610		410			470			470			550			203			416			429	
9	Lake Kitaura	Jingu Bridge				121		136			139			172			99			107			115			86	
10		Lake Sotonasakaura	Itako City			113		66			91			141			49			76			42			79	
11	Hitachitone River	Ikisu	Kamisu City			104		102			108			98			74			97			95			91	
12	Lake Ushikunuma	Center of Lake Ushikunuma	Ryugasaki City		1,010			850			980			770			840			510			740			760	
13	Mizunuma Dam		Kitaibaraki City			5,100		5,400			3,600			4,200			2,720			2,980			3,170			2,940	
14	Koyama Dam		Takahagi			940		690			890			1,250			740			690			770			1,750	
15	Hananuki Dam		City			2,730		2,520			2,000			1,940			610			1,290			1,050			1,380	
16	Jyuou Dam	Center	Hitachi City			620		520			1,750			950			1,920			1,980			2,540			1,360	
17	Ryuji Dam		Hitachiota City			1,020		1,010			760			1,110			0			900			740			490	
18	Fujiigawa Dam		Shirosato Town			500		480			450			650			193			498			117			346	
19	Iida Dam		Kasama City			18		0			45			53			180			11			55			156	
				*1: Bla	ink cell	ls are lo	ocation	s wher	e samp	oles we	ere not	collect	ed. The	e result	"Not o	letecta	ble" is	indic at	ed as "	0."							

Table 4.3-28 Detection of radioactive cesium at respective locations (Ibaraki Prefecture: lake sediments) (No.2)

		Location								La	ke Sec	liments	/Radio	oactiv	e Cesi	um (C	s-134	+Cs-1	37)/Co	oncent	ration	(Bq/kş	g)(*1)						Average of		coefficient	
No.	Wate	er area	Location						FY2	015											FY2	2016						Changes	FY2016 (*2)	No.	of	Trends (*3)
				4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		(2)		variation	
1		Hiroura			101			99			95			99			120			97			96			94		V~	102	1	0.43	\checkmark
2	Hinuma	Miyamae	Ibaraki Town		80			128			146			61			36			319			56			23		mm	109	2	0.62	$\bigwedge \bigwedge $
3		Oyazawa			470			405			465			367			439			332			351			288		\sim	353	3	0.25	\swarrow
4		Offshore of Tamatsukuri	Namegata City		540				530		439			461			460			446			557			444		A~~	477	4	0.42	~~~
5		Offshore of Kakeuma	Ami Town		137				261		132			147			83			130			103			62		hum	95	5	0.59	1
6	Lake Kasumigaura	Center	Miho Village		257				610		165			543			470			528			506			471		Mm	494	6	0.51	$\bigwedge \!\!\!\bigwedge$
7		Offshore of Aso	Inashiki City		108				121		133			124			107			105			108			106		have	107	7	0.35	\checkmark
8	I also Vitanas	Offshore of Kamaya	Namegata City		200				405		427			361			421			378			340			359		h	375	8	0.43	~~~*
9	Lake Kitaura	ic Käura Jingu Bridge Lake Očiy 128 102 118 117 100 53 107 122 100 96 9 0.32 100 Lake Sotonasakaura 94 89 115 81 64 67 93 51 100 0.36 53																														
10	Ilianhiana Diam	Jungu invige Izz Izz <t< td=""></t<>																														
11	Interface River Lake Sotonsakaura 94 89 115 81 64 67 93 51 Mode 69 10 0.36 Rine River Risu Kamiku City 91 80 82 91 86 53 64 51 Mode 64 11 0.49 10 0.36 Contex of Lake Rumarki 1 0																															
12	Lake Ushikunuma	Innuce Average Reminu Carp 91 80 82 91 86 53 64 51 64 11 0.49 53 e Ushkunuma Center of Lake Ushkunuma Ryugasaki Center of Lake Ushkunuma 800 670 660 565 730 586 616 650 646 12 0.35 54																														
13	Mizunuma Dam		Kitaibaraki City			2,490		3,070			2,730		2	2,600			2,750			2,490			2,140			1,980		hm	2,340	13	0.31	\checkmark
14	Koyama Dam		Takahagi			302		1,080			880			990			730			400			220			797		M	537	14	0.45	~~~*
15	Hananuki Dam		City			1,410		2,050			1,990		1	,310			1,670			1,470			1,180			1,510		\sim	1,458	15	0.34	~~~*
16	Jyuou Dam	Center	Hitachi City			1,170		1,340			346			445			1,310			543			1,480			1,520		NW	1,213	16	0.51	$\bigwedge \! \bigwedge$
17	Ryuji Dam		Hitachiota City			391		469			880			610			449			732			505			435		m	530	17	0.44	~~~*
18	Fujiigawa Dam		Shirosato Town		580												372			385			378			302		W~	359	18	0.36	~~~*
19	Iida Dam	Dam Kasama City 165 182 218 246 56 83 45 98 M 71 19 0.78 M																														
				*1: Bla	ank cel	ls are k	ocation	s wher	e samp	des we	re not c	ollected	l. The	result	"Not c	letec tab	ble" is	indic at	ed as "	0."			А	в	с	D	Е		499	Average		
				*2: Ar	ithmeti	c Aver	age; ca	lculate	d by as	suminą	ND=0	; Color	codes	show	catego	ories (s	ee the	right).														
				*3: Re	esults o	f the a	nalysis	of tren	ıds at re	especti	ve loca	tions us	ing the	meth	od exp	lained o	on 4.3	(1) 2)		>	Decra	easing	<i>></i> 1	ncreasir	ig ~	⊶ Ui	nchanged	AM Fluctu	ations			

Table 4.3-28 Detection of radioactive cesium at respective locations (Ibaraki Prefecture: lake sediments) (No.3)

4) Tochigi Prefecture

In Tochigi Prefecture, surveys were conducted 18 to 22 times from October 2011 to December 2016 for lake sediment samples collected at eight locations.

Regarding the concentration levels of detected values, three locations were categorized into Category D, and five locations into Category E (see Table 4.3-29 and Table 4.3-30).

Concentration levels were generally decreasing at two locations, fluctuating at four locations, and increasing at two locations.

Table 4.3-29 Categorizations of detected values at respective locations

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	0	(None)
D	Upper 25 to 50 percentile	3	No. 1, No. 3, No. 7
Е	Upper 50 to 100 percentile (lower 50%)	5	No. 2, No. 4, No. 5, No. 6, No. 8

(Tochigi Prefecture: lake sediments)



Figure 4.3-16 Changes in concentration levels over the years at respective locations (Tochigi Prefecture: lake sediments)

Table 4.3-30 Detection of radioactive cesium at respective locations

							'	(501	"g		10		010	10					an			,	
		Location						Lake	Sedim	ents/	Radioa	ctive (Cesiur	n (Cs-	134+	Cs-13	7)/Con	centra	tion(I	Bq/kg)	(*1)			
N/-	Watan	I		Municipality				FY20)11									FY2	2012					
190.	water area	Location		Municipality	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Nakagawa	Miyama Dam Reservoir	Center	Nasushiobara			48										850		11					
2	River System	Shiobara Dam Reservoir	Center	City			2,700				1,590						900		1,000		990		1,000	
3		Kawaji Dam Reservoir	Center				920				610						690		750		25		320	
4		Ikari Dam Reservoir	Center				4,400				6,700						4,100		3,300		2,500		4,000	
5	Kinugawa River System	Kawamata Dam Reservoir	Center	Nikko City			0				176					212			190		140			
6		Lake Yuno	Center				0										270		28		390			
7		Lake Chuzenji	Center				153										1,180		830		115		710	
8	Watarase River System	Watarase Reservoir	Center	Tochigi City			251										165	134		197				
					total r of sa	umber mples	166	Dete tin	ction nes	164														
					*1: Bla	nk cells	are loc	ations	where	sampi	es wer	e not c	collecte	d. The	e result	"Not	letec ta	ble" is	indica	ted as	"0."			

(Tochigi Prefecture: lake sediments)

		Location								Lak	e Sedi:	ments	/Radio	active	Cesiu	ım (C	s-134-	Cs-1	37)/Co	ncent	ration(Bq/kş	(*1)					
	NY .			M						FY2	2013											FY.	2014					
NO	. water area	Location		Municipality	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Nakagawa	Miyama Dam Reservoir	Center	Nasushiobara			284	106			610							343			560		1,230		740			
2	River System	Shiobara Dam Reservoir	Center	City			1,160	1,080			1,020		1,040					930			1,060		1,030		1,210	1		
3		Kawaji Dam Reservoir	Center				850	1,320			460		410					1,420			307		355		330			
4		Ikari Dam Reservoir	Center				2,530	5,100			1,980		2,560						1,740		8,700		4,500		2,090	1		
5	Kinugawa River System	Kawamata Dam Reservoir	Center	Nikko City			330		350		321		370					293			354		232		196			
6		Lake Yuno	Center				286		248		440		320						1,270		250		1,500	339				
7		Lake Chuzenji	Center				420		270		122		168					840			640		550		1,010	1		
8	Watarase River System	Watarase Reservoir	Center	Tochigi City			177		113		164		460					146			134		144		421			
					*1: B	ank ce	lls are	locatio	ns wh	ere san	nples w	vere no	ot colle	cted. 7	The res	ult "N	ot dete	ctable'	is ind	cated	as "0."							

		Location									La	ike Se	dimen	ts/Rad	lioacti	ve Ces	sium (Cs-134	+Cs-	137)/0	Conce	ntrati	on(Bq/	kg)(*1)					Average of		coefficient	
No.	Water area	Location		Municipality			-			FY2	015									_		FY	2016						Changes	FY2016 (*2)	No.	of variation	Trends (*3)
			r		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3					
1	Nakagawa	Miyama Dam Reservoir	Center	Nasushiobara			960		820		580		514					1,200			554		589		900				www	811	1	0.59	~
2	River System	Shiobara Dam Reservoir	Center	City			960		1,130		290		290					450			185		317		276				Lang_	307	2	0.58	\nearrow
3		Kawaji Dam Reservoir	Center			382			257		261		215					274			183		199		1,790)			m	612	3	0.81	$\wedge \wedge \wedge$
4		Ikari Dam Reservoir	Center			1,760			1,050		275		333					283			369		290		250				mh_	298	4	0.85	\uparrow
5	Kinugawa River System	Kawamata Dam Reservoir	Center	Nikko City		191			185		147		285					165			77		44		52				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	85	5	0.53	$\wedge \wedge \wedge$
6		Lake Yuno	Center				520		535		132		1,240					497			743		126		320				MM	422	6	0.88	$\wedge \wedge \wedge$
7		Lake Chuzenji	Center				870		640		1,010		880					760			930		1,130)	970				Mm	948	7	0.51	~
8	Watarase River System	Watarase Reservoir	Center	Tochigi City			103		123		137		148					118			128		143		129				~~M	130	8	0.54	$\wedge \wedge \wedge$
					*1: Bl	ank ce	lls are	loc atio	ns whe	re sam	nples w	ere no	ot colle	cted. T	'he res	ult "No	ot dete	ctable"	is indi	cated a	1s "0."	,		A	в	с	D	Е		451	Average		
					*2: A	rithmet	ic Ave	rage; c	alculat	ed by a	issumi	ing ND	=0; C	olor co	des sh	ow cat	egorie	s (see ti	he rigł	ıt).													
					3: R	esults (of the a	analysis	of tre	nds at	respec	tive lo	cation	s using	the m	ethod e	explain	ed on 4	.3(1)	2)		D	ecreasi	ng -	7	ncreas	ng	~~	Unchanged N	Fluctuations			

5) Gunma Prefecture

In Gunma Prefecture, surveys were conducted 16 to 22 times from November 2011 to December 2016 for lake sediment samples collected at 24 locations.

Regarding the concentration levels of detected values, 13 locations were categorized into Category D and 11 locations were categorized into Category E (see Table 4.3-31 and Table 4.3-32).

Concentration levels were generally decreasing at 10 locations, unchanged at six locations, fluctuating at seven locations, and increasing at one location.

Table 4.3-31 Categorizations of detected values at respective locations (Gunma Prefecture: lake sediments)

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	0	(None)
D	Upper 25 to 50 percentile	13	No. 1, No. 2, No. 3, No. 5, No. 7, No. 9, No. 10, No. 12, No. 13, No. 15, No. 16, No. 17, No. 22
Е	Upper 50 to 100 percentile (lower 50%)	11	No. 4, No. 6, No. 8, No. 11, No. 14, No. 18, No. 19, No. 20, No. 21, No. 23, No. 24



Figure 4.3-17 Changes in concentration levels over the years at respective locations (Gunma Prefecture: lake sediments)

		Location			1		La	nke So	dime	nts/Ra	ndioac	tive C	Cesiun	ı (Cs-	134+	Cs-13	7)/Co	ncent	ration	(Bq/k	g)(*1)			
N.,	Watan anna	Ition		Municipality				FY20	11									FY2	2012					
INO.	water area	Location		Municipality	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		Lake Okutone (Yagisawa Dam)	Center						750							1,250		2,210		1,210				
2		Lake Naramata (Naramata Dam)	Center	Minakami Town					0							1,130		3,400		2,420				
3		Lake Dogen (Sudagai Dam)	Center						1,490							970		640		560				
4		Lake Marunuma (Marunuma Dam)	Center	Katashina Village					0								540		98		16			
5	Tonegawa River	Lake Fujiwara (Fujiwara Dam)	Center	Minakami Town					4,600							1,430		2,900		1,880				
6		Lake Tanbara (Tanbara Dam)	Center	Numata City												33		860		380				
7		Lake Akaya (Aimata Dam)	Center	Minakami Town					1,690		1,970					2,560		3,800		2,320				
8		Lake Sonohara (Sonohara Dam)	Center	Numata City					420								500	490		500				
9		Lake Akagionuma	Center	Maebashi City				1,310								104		1,400		1,480				
10		Lake Okushima (Shimagawa Dam)	Center	Nakanojo Town					660								530		1,760	380				
11	Agatsuma River Area	Lake Shimako (Nakanojo Dam)	Center	Ivakanojo Town													94		1,120	510		1,350		
12		Lake Tashiro (Kazawa Dam)	Center	Tsumagoi Village					650						540			780			800			
13		Lake Haruna	Center	Takasaki City/Higashi- Agatsuma Town				0							114			76		30				
14		Lake Kirizumi (Kirizumi Dam)	Center	Annaka City					49						790			3,700		1,900				
15		Lake Usui (Sakamoto Dam)	Center	Philliaka City					2,600			970			1,950			4,100		3,500				
16	Karasu River	Lake Arafune (Dodairagawa Dam)	Center	Shimonita Town					37		233				310			390			450	239		
17		Lake Oshio (Oshio Dam)	Center	Tomioka City					740		280						540		680	196		310		
18		Lake Kanna (Shimokubo Dam)	Center	Fujioka City/Kamikawa Town					75		197				128			213			228	242		
19		Lake Hebikami (Shiozawa Dam)	Center	Kanna Town					1,670						690			270			990			
20	Watarase River	Lake Kusaki (Kusaki Dam)	Center	Midori City					147			1,860				2,400		207			440		760	
21	Area	Lake Umeda (Kiryugawa Dam)	Center	Kiryu City					179			0			123			129			710		280	
22	Nakatsu River	Lake Nozori (Nozori Dam)	Center	Nakanojo Town														550	300	700				
23	Watarase River	Lake Jonuma	Center	Tatebayachi City																				
24	Area	Lake Tataranuma	Center	Tacoayasin City																				
					total nur san *1: Blan	mber of 1ple 1k cells a	479 re loca	Dete tin tions v	ction nes vhere s	475 amples	were	not col	llected.	The re	esult "?	Not det	ectable	" is ind	licated	as "0."	,			
1																								

Table 4.3-32 Detection of radioactive cesium at respective locations (Gunma Prefecture: lake sediments) (No.1)

		Location							I	.ake S	Sedim	ents/F	adioa	ctive	Cesiu	m (Cs	-134-	-Cs-1	37)/C	oncen	tratio	n(Bq/	kg)(*1)				
No	Water area	Location		Municipality						FY2	013											FY2	2014					
140.	water area	Location		Municipanty	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		Lake Okutone (Yagisawa Dam)	Center				2,260		1,230		1,250	1,550						1,520			760		1,170	850				I
2		Lake Naramata (Naramata Dam)	Center	Minakami Town			2,920		1,100		910	3,900						750			2,280		2,060	1,950		-		1
3		Lake Dogen (Sudagai Dam)	Center				960		660		440		540					860			680		820		600			
4		Lake Marunuma (Marunuma Dam)	Center	Katashina Village			21	151			81		74					211			201		349	127		1		
5	Tonegawa River	Lake Fujiwara (Fujiwara Dam)	Center	Minakami Town				1,310	1,160		2,130		3,590					1,140			1,240		1,330		1,100	1		
6		Lake Tanbara (Tanbara Dam)	Center	Numata City			420		390		890		520					570			530		1,250			1		
7		Lake Akaya (Aimata Dam)	Center	Minakami Town			2,790		3,500		3,260		760					1,830			1,240		2,650		1,950			
8		Lake Sonohara (Sonohara Dam)	Center	Numata City			590		440		380		164					266			237		342		336	1		
9		Lake Akagionuma	Center	Maebashi City			1,060	1,860			980		1,000					1,040			790		640	5,100		1		
10		Lake Okushima (Shimagawa Dam)	Center	Nekonojo Town			560		630		4,300		1,520					1,110			438		1,710	1,600		1		
11	Agatsuma River Area	Lake Shimako (Nakanojo Dam)	Center	Nakalojo Town			840		1,190		860		278					266			510		570	410		1		1
12		Lake Tashiro (Kazawa Dam)	Center	Tsumagoi Village			850		110		1,260	1,160							1,420		1,120		1,180	1,320				
13		Lake Haruna	Center	Takasaki City/Higashi- Agatsuma Town			47		460		148							266			490		112	520				
14		Lake Kirizumi (Kirizumi Dam)	Center				2,380		310		770		490					38			1,420		800		810			
15		Lake Usui (Sakamoto Dam)	Center	Annaka City			3,400		3,400		1,340		1,960					215				1,230	1,330		1,160			
16	Karasu River	Lake Arafune (Dodairagawa Dam)	Center	Shimonita Town			490		630		620		530					710			770		700		840			
17		Lake Oshio (Oshio Dam)	Center	Tomioka City			340		660		400		320					650			830		1,170		700			
18		Lake Kanna (Shimokubo Dam)	Center	Fujioka City/Kamikawa Town		178			320		410		93					173			100		119		222			
19		Lake Hebikami (Shiozawa Dam)	Center	Kanna Town			111		720		610		770					660			520		590		550			
20	Watarase River	Lake Kusaki (Kusaki Dam)	Center	Midori City		650		1,010			720		1,670					390			361		400		345			
21	Area	Lake Umeda (Kiryugawa Dam)	Center	Kiryu City		62		203			810		245						1,130		1,000		980		1,420			
22	Nakatsu River	Lake Nozori (Nozori Dam)	Center	Nakanojo Town			82		660		1,580	181							1,900		358		1,220					
23	Watarase River	Lake Jonuma	Center	Tatabauahi Citu		540			301		291		670					720			720		260		241			
24	Area	Lake Tataranuma	Center	l atebayashi City		1,440			950		530		1,240					850			750		1,200		530			
L																												

Table 4.3-32 Detection of radioactive cesium at respective locations (Gunma Prefecture: lake sediments) (No.2)

Table 4.3-32 Detection of radioactive cesium at respective locations (Gunma Prefecture: lake sediments) (No.3)

No. Late Oktore (Sodga) Dam) Center Municipality I Vol <	f No.	of Trends variation (*3)
No. Vial and and the field of the fie	1	variation
1 Image: Answer And Stress	1	
2 Image: Answarding (Narmange Integration of the Stream of the Strea		0.34
3 Image: Additional product of the state of the st	2	0.53
4 Image: Anomaly and the strength of the strengt	3	0.35
5 Tonggwa Row (Pojwara Dam) Center Minkami Town Image: Section 2010/1000/1000/1000/1000/1000/1000/1000	4	0.76
6 Lake Tanbara, Center Numata City 1,430 1.270 660 550 245 710 329 171 1	5	0.61
(1 and 2 and)	6	0.62
7 Lake Akaya (Aimata Dam) Center Minakami Town 750 980 1,350 1,850 1,030 2,230 1,710 1,740 1,070 1,070	7	0.43
8 Lake Sonohara (Sonohara Dam) Center Numata City 281 279 193 146 16 150 181 235 230 10 10 10 10 10 10 10 10 10 10 10 10 10	8	0.42
9 Lake Akagionuma Center Maebashi City I 1740 1230 660 1920 11.750 2200 2,110 1,350 1.50 1.85	9	0.68
10 Lake Okushima (Shimagawa Dam) Center Value in Tara 4570 1.140 580 2.070 1.600 2.510 1.190 1.240 1.240 1.040 1.633	10	0.77
11 Agatsuma River Lake Shimako (Nakanojo Dam) Center 720 670 107 339 314 227 252 384 M M 2000 294	11	0.66
12 Lake Tashiro (Kazwa Dam) Center Tsumagoi Vilage 343 610 620 580 574 574 535 412 1.030 - 7/-1 638	12	0.45
13 Lake Harma Center Takasaki City Higgshi- Agatsuma Town 470 346 460 650 610 246 152 1,40	13	0.96
14 Lake Krizumi (Krizumi Dam) Center 100 570 600 680 670 386 405 489 429 March Center 427	14	0.99
15 Lake Usui (Sakamoto Dam) Center 990 990 1,130 830 740 628 840 763 700 773	15	0.70
16 Karasu River Lake Arafune (Dodairagawa Dam) Center Shimonia Town 530 237 47 660 760 488 467 744 777 615	16	0.47 ~~~
17 Lake Oshio (Oshio Dam) Center Tomioka City 468 610 640 600 660 660 660 660 664 674 674 670 MMMM 660 660 666 666 666 666 666 666 6	17	0.38
18 Lake Kanna (Shimokubo Dam) Center Fujoka City/Kamikawa Town 226 175 118 272 26 120 281 218 100	18	0.47
19 Lake Hebikami (Shiozawa Dam) Center Kanna Town 530 521 548 476 292 439 329 207 317	19	0.57
20 Watarase River Kusaki Dam) Center Midori City 200 237 357 115 318 205 509 282 1 1 329	20	0.98
21 Area Lake Umeda (Kiryugawa Dam) Center Kiryu Ciry 240 780 950 500 760 248 129 59 50 50 249	21	0.84
22 Nakasu River Lake Nozori (Nozori Dam) enter Nakanojo Town 1,020 2,210 1,050 454 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	22	0.65
23 Watarase River Lake Jonuma Center Tatebugshi City 518 560 660 668 668 673 673 67448 539 448 759 448	23	0.33 ~~~
24 Autor 510 590 429 1,660 527 383 320 383 MLA 403	24	0.48
*1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0." A B C D E 721	Averag	pe -
*2: Arithmetic Average; calculated by assuming ND=0; Color codes show categories (see the right).		_
*3: Results of the analysis of trends at respective locations using the method explained on 4.3(1) 2) 📏 Decreasing are luchanged AMA Fluctus	ons	

6) Chiba Prefecture

In Chiba Prefecture, surveys were conducted 22 times from November 2011 to February 2017 for lake sediment samples collected at eight locations.

Regarding the concentration levels of detected values, one location was categorized into Category C, one location into Category D, and six locations into Category E (see Table 4.3-33 and Table 4.3-34).

Concentration levels were generally decreasing at seven locations and were unchanged at one location.

Table 4.3-33 Categorizations of detected values at respective locations (Chiba Prefecture: lake sediments)

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	1	No. 4
D	Upper 25 to 50 percentile	1	No. 3
Е	Upper 50 to 100 percentile (lower 50%)	6	No. 1, No. 2, No. 5, No. 6, No. 7, No. 8





		Location				T	oko Se	dimor	nte /D	odioo	otivo	Cori		Cc 12	4-1-0	Ce 12	27/10	- -		on (P	where a loss	en)									
		Location	1			Б	ake Se	anner	ns/Ra	aciioad	cuve	Cesi		CS-15	474	CS-12	57)/C	Joncer	2012	011(D	f kg)(-1)									
No.		Location	Municipality		0	10	F 12	12	1	2	2	4			6	7	0	P 1	2012	11	12	1	2	2							
1		Fusashita		8	9	10	870	12	1	2)	4		9	80	/	8	9 940	10	11	900		2 880	3							
2	Laka	Shimoteganuma Chuo	Inzai City				1,350			1,140)			6	50			720			490	,	900								
3	Teganuma	Teganuma Chuo	Abiko City/Kashiwa				990			1,670)			9	90			1,540)		1,58	D	1,540								
4		Nedoshita	City				3,300			7,400)			5,3	300			7,600)		7,60	D	8,200								
5		Kita-Inbanuma Chuo	Inzai City/Narita City				730			880				9	10			630			460)	560								
6	Lake	Ipponmatsushita	Inzai City				1,160			1,070)			6	00			860			740)	730								
7	Inbanuma	Lower area of Josuido water intake	Sakura City				1,100			1,250)			9	40			1,050)		910)	880								
8		Asobashi Bridge	Yachiyo City				1,160			440				9	80			800			1,08	D	970								
				total of s	numbe	r 176	Dete	ction	176																						
				*1: B	lank cel	lls are k	ocations	where	e samp	oles we	ere no	t colle	cted.	The r	esult '	"Not	detect	table" i	is indi	cated	ıs "0."										
									1																						
																												-			
		Location	1					Lak	e Sec	dimen	its/Ra	adioa	ctive	Cesi	um (Cs-1	34+	Cs-1	37)/C	oncer	tratio	n(Bq/l	(*1)					_			
No.		Location	Municipality	4	6	6	2		FY20	13	11	12	1	2	2	,	4	6	۷	7		FY20	14		2	1 2	2	4			
1		Fusashita		4	660	0	,	140	,	10	880	12	730	1			•		710	,	0	750	10	5	00	52	0	-			
2	Lake	Shimoteganuma Chuo	Inzai City		420		:	349		:	520		760	,					440			320		3	25	44	3				
3	Teganuma	Teganuma Chuo	Abiko City/Kashiwa		420		1	,200		1	,320		1,550	D				1	,270			1,150		1,	300	1,2	30				
4		Nedoshita	City		2,530		3	,800		4	1,400		5,70	D				5	,700			4,700		3,	500	4,0	60				
5		Kita-Inbanuma Chuo	Inzai City/Narita City		151		:	195		:	550		500	•					360			480		4	50	35	0				
6	Lake	Ipponmatsushita	Inzai City		152		4	440		:	560		570	•					313			430		5	20	49	0				
7	Inbanuma	Lower area of Josuido water intake	Sakura City		340		1	251			800		800	•					760			730		6	90	62	0				
8		Asobashi Bridge	Yachiyo City		770		4	360		:	266		202						121			460		3	04	33	8				
				*1:B	slank ce	ells are	locatio	ns whe	ere sai	mples	were	not c	ollect	ted. T	he res	sult "?	Not d	detecta	ıble" i	is indi	ated a	s "0."									
	-	Location							La	ke Se	dime	nts/R	adio	active	e Ces	sium	(Cs-	134+	Cs-1	37)/C	oncen	ration	(Bq/kg)(*1)					Average of		001.1
No.		Location	Municipality	4	5	6	7	F 8 9	FY201:	5	1	12	1	2	3	4	5	5 6		7	8 9	Y2016) 11	12	1	2	3	Changes	FY2016 (*2)	No.	of variati
1		Fusashita				283		47	74		5	530		451				35	0		37	5		438		505		$\sim\sim$	426	1	0.36
2	Lake	Shimoteganuma Chuo	ilizai City			441		32	24		2	264		338				35	i4		19	97		235		315		w~~	309	2	0.58
3	Teganuma	Teganuma Chuo	Abiko City/Kashiwa		1	,160		99	90		1,	,110		870				99	0		1,0	30		894		1,050	/	v/~~~	1,012	3	0.25
4		Nedoshita	City		3	,510		2,9	70		3,	,180		4,240				2,4	90		2,4	60		2,520)	2,230	/	~~	2,950	4	0.42
5		Kita-Inbanuma Chuo	Inzai City/Narita City			355		39	91		3	354		328				34	8		35	57		392		405	_	m	366	5	0.41
6	Lake Inbanuma	Ipponmatsushita	Inzai City		-	520		50)9		3	313		473				42	4		38	80		465		451		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	442	6	0.43
7		water intake	Sakura City		_	570		58	30		6	510		505				48	6		43	3		495		382		· V~~	508	7	0.38
8		Asobashi Bridge	Yachiyo City			187		21	16		3	312		273		<u> </u>		9	0		17	'9		117		66		\sim	180	8	0.79
				*1: Bla	nk cells	are loc	ations v	where s	sample	s were	e not c	collect	ed. Tl	he rest	ult "N	lot det	ectab	ole" is i	ndicat	ed as '	0."		A	В	С	D	Е		774	Average	
				*2: Ari	thmetic	Averaş	ge; calc	ulated b	oy assu	uming !	ND=0); Colo	r cod	les sho	w ca	tegori	es (se	ee the I	right).				ج.				huma 1	AAAE	~		
1				*3: Res	sults of	the ana	ilysis of	trends	at res	pective	e locat	tions u	ising t	the me	thod (explai	ned o	on 4.3()	1)2)		⇒ Dea	reasing	_	increasi	ı <u>ғ</u> ~	- Unc	nanged	/vvv-iuctuation			

Trends (*3)

Table 4.3-34 Detection of radioactive cesium at respective locations (Chiba Prefecture: lake sediments)

(2)-3 Coastal areas

1) Iwate Prefecture

In Iwate Prefecture, surveys were conducted 11 times from January 2012 to November 2016 for coastal area sediment samples collected at two locations.

Regarding the concentration levels of detected values, both locations were categorized into Category E (see Table 4.3-35 and Table 4.3-36).

Concentration levels were unchanged at one location and fluctuating at the other location.

		NI 1 C	
Category	Percentile (percentile in all detected values)	locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	0	(None)
D	Upper 25 to 50 percentile	0	(None)
Е	Upper 50 to 100 percentile (lower 50%)	2	No. 1, No. 2

Table 4.3-35 Categorizations of detected values at respective location	ns
(Iwate Prefecture: coastal area sediments)	



Figure 4.3-19 Changes in concentration levels over the years at respective locations (Iwate Prefecture: coastal area sediments)

Table 4.3-36 Detection of radioactive cesium at respective locations (Iwate Prefecture: coastal area sediments)

	Location				Coast	al area s	edimen	ts/Radio	active C	esium	(Cs-13	4+Cs	-137)/	Concer	ntratio	n(Bq/k	g)(*1)				
N.	Teenting				FY.	2011									FY2	2012					
NO.	Location	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Ofunato Bay (A)						0										33				39
2	Hirota Bay						0										0			0	
		total nu sam	mber of ples	22	Detecti	on times	8														
		*1: Blan	k cells ar	re locatio	ns where	e samples	s were n	ot collect	ed. The	result "	Not de	tectable	e" is inc	licated	as "0."	,					

	Location						Coast	al area	sedin	ents/F	tadioad	tive C	esium	(Cs-13	34+Cs	-137)/	Conce	ntratio	n(Bq/l	(*1)					
N.	Instign						Fy2	2013											Fy2	2014					
INO.	Location	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Ofunato Bay (A)				46				35						16						13				
2	Hirota Bay				0				0						0						0				

*1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0."

	Location							Coast	tal are	a sediı	ments/	Radioa	active (Cesium	ı (Cs-1	134+0	Cs-137)	/Conce	entrati	on(Bq/	kg)(*1	l)					Average			
N							FY2	2015											FY2	2016							of FY2016	5 No.	coefficient of variation	Trends (*3)
NO.	Location	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	Changes	(*2)		or variation	(5)
1	Ofunato Bay (A)			0					10						12						0					\frown	6.0	1	0.91	$\wedge \wedge \wedge$
2	Hirota Bay			0					0						0						0						0	2	-	~~~*
		*1: Bl	ank cel	ls are le	ocation	s where	e samp	les wer	e not c	ollected	d. The	result "	'Not de	:tec table	e" is in	dicated	as "0.'	,			А	в	с	D	Е		3.0	Average	2	
		*2: Ai	ithmeti	c Aver	age; ca	dc ulated	1 by as:	suming	ND=0	; Color	codes	show c	categor	ies (see	e the ri	ght).														
		*3: Re	sults o	f the ar	nalysis	of trend	ds at re	spectiv	e locati	ions us	ing the	metho	d expla	uined on	n 4.3(1)) 2)	\searrow	Decre	easing	\rightarrow	Increasi	ing ~	∽ • U	nchange	i A	A Fluctuations				

2) Miyagi Prefecture

In Miyagi Prefecture, surveys were conducted 11 to 47 times from October 2011 to February 2017 for coastal area sediment samples collected at 12 locations (this analysis excludes the survey results from 28 locations where the survey was conducted only in 2011).

Regarding the concentration levels of detected values, one location was categorized into Category A, one location into Category B, two locations into Category C, three locations into Category D, and five locations into Category E (see Table 4.3-37 and Table 4.3-38).

Concentration levels were generally decreasing at three locations, unchanged at one location, fluctuating at seven locations, and increasing at one location.

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	1	No. 8
В	Upper 5 to 10 percentile	1	No. 2
С	Upper 10 to 25 percentile	2	No. 7, No. 9
D	Upper 25 to 50 percentile	3	No. 1, No. 6, No. 11
Е	Upper 50 to 100 percentile (lower 50%)	5	No. 3, No. 4, No. 5, No. 10, No. 12

Table 4.3-37 Categorizations of detected values at respective locations (Miyagi Prefecture: coastal area sediments)





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-20 Changes in concentration levels over the years at respective locations (Miyagi Prefecture: coastal area sediments)

Table 4.3-38 Detection of radioactive cesium at respective locations

						(M	iya	ıgı	Pr	ete	ect	ure	e: (coa	asi	al	ar	ea	se	dir	ne	ents	3)
	Locatio	n				Coast	al are:	a sedir	nents/	Radioa	ctive	Cesiur	n (Cs-	134+	Cs-137)/Con	centra	tion(B	q/kg)(*	^{\$} 1)			
No	Loo	tion				FY20	11										FY201:	2					
INO.	Loca	ation	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	I	2	3
1	Kesennuma Bay (B)	Offshore of Hachigasaki			17			0											54	5	0	16	48
2	Kesennuma Bay (C)	Offshore of Oshimakita			0			158											44	41	10	91	78
3	All other neighboring sea areas	Oppa Bay (Jyusanhama Beach)			350				390										216	28	81	12	101
4	Neighboring sea area of Ishinomaki (C)	Lake Mangokuura, M-6 (center)			0				75										109	10)1	77	145
5	Neighboring sea area of Ishinomaki (B-3)	Offshore of Kitakami River Estuary			105				25									0	0	0)	0	
6	Neighboring sea area of Ishinomaki (C)	Offshore of Naruse			165				205									136	101	5	6	93	
7	Matsushima Bay (B)	Nishihama Beach			139				830									410	450	47	70	400	
8	Neighboring sea area of Sendai Port(A)	Naiko Inner Port, 4-Nai			270			213										1,530	1,500	1,5	530	1,020	
9	Neighboring sea area of Sendai Port (B)	Gamo-3			44			540										0	258	3	3	10	
10	All other neighboring sea areas	Ido-5			71			28										0	12	0)	0	
11	Offshore of Abukuma River Estuary				390			230										142	128	193	131	103	115
12	Offshore of Tsuyagawa River Estuary				0														0			0	
			total nu san	mber of ples	278	Dete tin	ction nes	225															
			*1: Blan	k cells a	re locat	ions w	here sa	imples	were i	iot coll	ected.	The re	sult "N	ot dete	ctable'	' is ind	icated a	as "0."					

(Miyagi Prefecture: coastal area sediments)

	Locatio	n					Coa	stal ar	ea sed	liment	s/Radi	oactive	e Cesit	ım (Cs	s-134-	Cs-1	\$7)/Co	ncentr	ation(Bq/kg))(*1)					
No	Log	tion]	FY201:	3											FY2	2014					
140.	Loca	lion	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Kesennuma Bay (B)	Offshore of Hachigasaki				57	174			191			76			67			82			141			87	
2	Kesennuma Bay (C)	Offshore of Oshimakita				400	740			450			19			68			72			490			464	
3	All other neighboring sea areas	Oppa Bay (Jyusanhama Beach)		26			203			76			23			163			52			0			15	
4	Neighboring sea area of Ishinomaki (C)	Lake Mangokuura, M-6 (center)		74			51			71			76			74			71			54			48	
5	Neighboring sea area of Ishinomaki (B-3)	Offshore of Kitakami River Estuary				109	148			0			0			0			0			0			0	
6	Neighboring sea area of Ishinomaki (C)	Offshore of Naruse				151	128			17			16			149			136			36			93	
7	Matsushima Bay (B)	Nishihama Beach			450		540			360			229			440			520			155			230	
8	Neighboring sea area of Sendai Port(A)	Naiko Inner Port, 4-Nai			1,030		2,040			530			420			55			54			322			1,090	
9	Neighboring sea area of Sendai Port (B)	Gamo-3			35		50			31			19			49			0			0			327	
10	All other neighboring sea areas	Ido-5			10		12			102			48			49			11			21			140	
11	Offshore of Abukuma River Estuary				61	13 108	2,030	21	290		170	62	55			45	126	1,020	118	400	0	311	226	86	80	
12	Offshore of Tsuyagawa River Estuary					0				0						0						0				
			*1: Bk	ink cel	ls are k	ocations who	re sam	ples we	re not	collect	ed. Th	e resul	t "Not o	detecta	ble" is	indic at	ed as '	0."								
	Location	n						Coasta	ıl area	sedim	ents/R	adioad	tive C	esium	(Cs-1	34+C	-137)/	Conce	itratio	n(Bq/l	kg)(*1)				
N.	Leve						FY20	15											FY201	6						

	Locatio	n							Coas	tal are	a sedi	ments	/Radio	active	Cesiu	m (Cs-	134+	Cs-13	7)/Con	centra	ation(l	Bq/kg)	(*1)					A			
N	T	+i						FY.	2015											FY2	2016							FY2016	No.	coefficient of	Trends
INO.	Loca	non	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	Changes	(*2)		variation	(*3)
1	Kesennuma Bay (B)	Offshore of Hachigasaki			99		40			47			105			117			95			144			47		m	101	1	0.63	$\bigwedge \! \bigwedge$
2	Kesennuma Bay (C)	Offshore of Oshimakita			426		382			418			277			398			351			385			299		~~~~	358	2	0.67	\mathbb{M}
3	All other neighboring sea areas	Oppa Bay (Jyusanhama Beach)			181		17			0			0			12			0			18			0		m	7.5	3	1.26	Į
4	Neighboring sea area of Ishinomaki (C)	Lake Mangokuura, M-6 (center)		110			59			76			61			32			35			10			19		An	24	4	0.53	\mathbb{N}
5	Neighboring sea area of Ishinomaki (B-3)	Offshore of Kitakami River Estuary		0			0			24			0			0			0			0			0			0	5	2.29	\mathbb{N}
6	Neighboring sea area of Ishinomaki (C)	Offshore of Naruse		53			120			65			115			66			79			0			66		m	53	6	0.57	\swarrow
7	Matsushima Bay (B)	Nishihama Beach		216			239			198			180			195			243			203			157		m	200	7	0.52	\swarrow
8	Neighboring sea area of Sendai Port(A)	Naiko Inner Port, 4-Nai		530			740			563			530			601			492			383			392		Mm	467	8	0.74	\sim
9	Neighboring sea area of Sendai Port (B)	Gamo-3		15			560			910			790			0			710			298			337		m	336	9	1.29	~
10	All other neighboring sea areas	Ido-5		0			0			0			0			0			0			0			0		M	0	10	1.65	$\bigwedge \! \bigwedge$
11	Offshore of Abukuma River Estuary			113	144	135	265	171	124	104	116	119	129			114	117	128	93	94	105	53	73	97	138		h	101	11	1.63	\sim
12	Offshore of Tsuyagawa River Estuary				0					0						0						0						0	12	-	~~~
			*1: Bl	ank ce	lls are l	ocatior	is whe	re sam	ples we	ere not	collect	ed. Th	e resul	t "Not	detecta	ble" is	indic at	ed as '	°0."			A	в	с	D	Е		137	Average		
			*2: Ai	ithmet	ic Aver	age; ci	alculate	d by a	ssumin	g ND=	0; Cok	or code	s shov	v categ	ories (s	see the	right).														
			*3: Ro	esults o	of the a	nalysis	of trei	ıds at ı	espect	ive loca	ations a	using ti	ne metl	hod exp	lained	on 4.3(1) 2)		>	Decre	easing	~	Incre	asing	~~	► Unc	hanged AM Flu	octuations			

3) Fukushima Prefecture

In Fukushima Prefecture, surveys were conducted 40 to 53 times from October 2011 to February 2017 for coastal area sediment samples collected at 15 locations (this analysis excludes the survey results from eight locations where the survey was conducted only once in 2011).

Regarding the concentration levels of detected values, one location was categorized into Category A, one location into Category B, three locations into Category C, five locations into Category D, and five locations into Category E (see Table 4.3-39 and Table 4.3-40).

Concentration levels were generally decreasing at 10 locations, unchanged at one location, and fluctuating at four locations.

Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	1	No. 14
В	Upper 5 to 10 percentile	1	No. 9
С	Upper 10 to 25 percentile	3	No. 7, No. 8, No. 10
D	Upper 25 to 50 percentile	5	No. 2, No. 4, No. 11, No. 12, No. 15
Е	Upper 50 to 100 percentile (lower 50%)	5	No. 1, No. 3, No. 5, No. 6, No. 13

Table 4.3-39 Categorizations of detected values at respective locations (Fukushima Prefecture: coastal area sediments)





2) Scales of the vertical axes differ in the left and right figures.

Figure 4.3-21 Changes in concentration levels over the years at respective locations (Fukushima Prefecture: coastal area sediments)

Table 4.3-40 Detection of radioactive cesium at respective locations

		,															,	`		'				
	L	ocation					Coast	al area	a sedin	ents/R	adioac	tive C	esium	(Cs-13	4+Cs-	137)/C	Concent	ration	Bq/kg)(*1)				
No		Logation				FY2	011										FY2	012						
140.		Location	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	1	1	12	1		2	3
1	Neighboring sea area of Soso	Approx. 2,000 m offshore of Tsurushihama Fishing Port			35	123		1,240		38				320	62	0	11	3	0	0	11		0	0
2	Matsukawaura sea area	Around center of Fishing Right Area- 1 in Matsukawaura sea area			94	32		610		15				300	164	90		105	123	175	55	53	48	
3	Neighboring sea area of Soso	Approx. 2,000 m offshore of Manogawa River			81	57		102		36				106	38	300	36	13	81	11	91	4	15	19
4	Neighboring sea area of	Approx. 1,000 m offshore of Niida River			177	49		300		44				290	280	470	400	26	58	114	67	6	10	
5	Haramachi City	Approx. 1,000 m offshore of Ota River															36	4	8	53		5	18	57
6		Approx. 1,000 m offshore of Odaka River																88	127	50	59	1	87	37
7	Neighboring sea area of	Approx. 2,000 m offshore of Ukedo River																						
8	Soso District	Approx. 1,000 m offshore of Kumagawa River																						
9		Approx. 1,000 m offshore of Tomioka River																						
10	Neighboring sea area of Naraha Town	Approx. 1,000 m offshore of Kidogawa River																400	380	154	113	380	530	
11	Approx. 1,000 m offshore of	of Asami River Estuary			730	480		900		480				570	470	310	330	36	50	1,110	970	277	430	
12	Approx. 1,000 m offshore of	of Ohisa River Estuary			520	490		246		205				153	196	170	102	21	3	54	80	290	200	
13	Neighboring sea area of Iwaki City	Approx. 1,500 m offshore of Natsui River			590	211		310		223				156	159	113	133	7	4	150	86	125	132	
14	Onahama Port	Approx. 400 m north of Nishibouhatei No. 2			380	630		590		156				590	480	280	550	73	80	770	420	470	460	
15	Joban coastal sea area	Approx. 1,000 m offshore of Binda River			800	360		340		260				280	214	249	193	16	57	77	168	169	184	
			total n of sa	umber mples	733	Dete tin	ction nes	689																

(Fukushima Prefecture: coastal area sediments) (No.1)

*1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0."

	L	ocation						c	oastal	area so	dimen	ts/Rad	ioactiv	e Cesi	um (C	-134+	·Cs-13	7)/Con	centra	tion(B	n/kg)(*	1)					
								-	FY201	3								.,			FY2	2014					
No.		Location	4	5	6		7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	Neighboring sea area of Soso	Approx. 2,000 m offshore of Tsurushihama Fishing Port			28	12	0	44	10	0	0	0	81	11			0	12	0	0	0	0	0	0	0	0	
2	Matsukawaura sea area	Around center of Fishing Right Area- 1 in Matsukawaura sea area			26	18	11	48	101	0	89	45	164	39			38	73	32	17	19	43	45	26	0	44	
3	Neighboring sea area of Soso	Approx. 2,000 m offshore of Manogawa River			15	36	17	55	23	48	61	16	13	11			35	18	17	20	17	10	31	24	17	12	
4	Neighboring sea area of	Approx. 1,000 m offshore of Niida River			51	33	38	61	79	27	70	48	43	221			13	20	12	27	18	22	41	43	0	85	
5	Haramachi City	Approx. 1,000 m offshore of Ota River			47	14	38	15	38	47	44	51	81	54			24	22	18	17	15	38	21	26	26	24	
6		Approx. 1,000 m offshore of Odaka River			38	31	44	39	380	64	64	59	45	35			20	18	28	22	18	22	21	16	10	21	
7	Neighboring sea area of	Approx. 2,000 m offshore of Ukedo River			214	420	234	1,240	187	243	294	870	133	152			90	182	440	205	230	263	293	194	163	206	
8	Soso District	Approx. 1,000 m offshore of Kumagawa River			620	570	620	620	580	530	400	500	700	620			440	470	450	368	333	297	374	350	365	403	
9		Approx. 1,000 m offshore of Tomioka River			520	480	1,600	440	340	610	530	520	510	1,140			530	388	385	390	390	410	500	430	550	417	
10	Neighboring sea area of Naraha Town	Approx. 1,000 m offshore of Kidogawa River			295	290	251	154	191	278	243	290	198	1,160			370	240	201	215	203	274	275	404	144	234	
11	Approx. 1,000 m offshore of	of Asami River Estuary			320	290	190	241	143	272	254	202	192	262			127	268	105	173	100	88	205	188	209	219	
12	Approx. 1,000 m offshore of	of Ohisa River Estuary			149	131	102	125	96	75	167	100	155	161			75	76	43	84	101	105	76	55	64	65	
13	3 Neighboring sea area of Iwaki City River				55	60	55	63	47	57	49	53	90	76			101	80	70	89	78	54	50	35	45	44	
14	Onahama Port Approx. 400 m north of Nishibouhatei No. 2				580	460	400	740	450	380	520	560	370	630			540	540	450	450	780	480	440	830	449	354	
15	Joban coastal sea area	Approx. 1,000 m offshore of Binda River			112	139	108	189	129	200	104	205	122	98			104	124	114	102	96	108	88	75	84	125	
			*1: Bla	ink cell	s are lo	cations	where	sample	s were	not co	llected.	The re	sult "N	ot dete	ctable"	is indic	ated as	"0."									

Table 4.3-40 Detection of radioactive cesium at respective locations (Fukushima Prefecture: coastal area sediments) (No.2)

	L	ocation							Co	astal a	rea sec	liment	s/Radio	active	Cesiu	m (Cs-	134+0	Cs-137)	/Conc	entrati	on(Bq/	kg)(*1)								
		x						FY2	2015											FY2	2016						a	FY2016	No.	coefficient of variation	Trends (*3)
NO.		Location	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	Changes	(*2)		or variation	(5)
1	Neighboring sea area of Soso	Approx. 2,000 m offshore of Tsurushihama Fishing Port		0	0	0	0	15	0	0	0	15	0			0	0	0	0	0	0	0	0	0	0		h	0	1	4.42	\checkmark
2	Matsukawaura sea area	Around center of Fishing Right Area- 1 in Matsukawaura sea area		103	35	23	16	2,460	2,950	800	1,230	570	333			618	180	235	129	82	117	0	27	43	55		much	149	2	2.27	\sim
3	Neighboring sea area of Soso	Approx. 2,000 m offshore of Manogawa River		0	13	13	12	58	109	16	22	13	18			12	11	10	13	0	12	0	0	24	14		manue	10	3	1.33	\nearrow
4	Neighboring sea area of	Approx. 1,000 m offshore of Niida River		10	15	20	17	322	284	251	112	218	95			52	46	41	81	121	105	148	84	22	128		Maria	83	4	1.10	\checkmark
5	Haramachi City	Approx. 1,000 m offshore of Ota River		20	18	17	19	22	52	17	39	25	33			18	12	14	20	29	28	29	10	30	31		Mahr	22	5	0.53	Ļ
6		Approx. 1,000 m offshore of Odaka River		31	59	0	12	62	58	232	46	26	20			32	20	22	17	83	32	32	44	14	51		alda	35	6	1.23	\mathbb{N}
7	Neighboring sea area of	Approx. 2,000 m offshore of Ukedo River		239	740	127	174	231	104	440	532	13	251			138	231	355	110	174	64	254	140	138	530		Martin	213	7	0.83	\sim
8	Soso District	Approx. 1,000 m offshore of Kumagawa River		213	397	267	301	308	402	365	321	319	418			351	282	292	217	240	235	240	199	253	235		Nor	254	8	0.35	Ļ
9		Approx. 1,000 m offshore of Tomioka River		311	295	367	480	354	297	484	372	265	313			353	316	315	321	399	273	433	656	371	312		hann	375	9	0.52	Ĺ
10	Neighboring sea area of Naraha Town	Approx. 1,000 m offshore of Kidogawa River		361	206	477	217	219	95	67	1,740	224	118			429	780	166	295	153	272	20	148	167	211		nhally	264	10	0.92	\sim
11	Approx. 1,000 m offshore of	of Asami River Estuary		123	132	150	72	92	175	118	124	137	134			87	77	102	88	93	68	80	73	41	114		M	82	11	0.91	Ļ
12	Approx. 1,000 m offshore of	of Ohisa River Estuary		66	33	38	63	56	55	50	31	45	43			43	41	43	35	51	40	46	33	31	28		Warne	39	12	0.92	Ļ
13	Neighboring sea area of waki City	Approx. 1,500 m offshore of Natsui River		60	37	25	31	48	47	35	24	32	66			36	20	20	20	22	26	23	25	24	21		human	24	13	1.12	Ļ
14	Onahama Port	Approx. 400 m north of Nishibouhatei No. 2		368	340	452	399	490	477	312	508	361	530			368	470	753	524	473	371	264	403	474	543		MARLAN	464	14	0.28	~~~
15	loban coastal sea area	Approx. 1,000 m offshore of Binda River		62	60	58	96	75	84	62	74	64	79			60	62	45	42	69	55	46	80	64	38		hanne	56	15	0.88	\checkmark
			*1: Bla	ink cell	s are lo	cations	where	sample	es were	not co	llec ted.	The re	sult "N	ot dete	table"	is indic	ated as	"0."				A	в	с	D	Е		138	Average		
			*2: Ar	ithmetic	Avera	ige; cak	culated	by ass	uming 1	ND=0;	Color c	odes sl	10w ca	tegories	(see tl	he right).														
			*3: Re	sults of	f the an	alysis o	of trend	s at res	spective	locatio	ns usir	ig the n	nethod	explain	ed on 4	.3(1) 2	, .	∽ I	Decreasi	ng -	≯ In	creasing	~	▲ Uncl	hanged	\sim	Fluctuations				
			*1: Bla *2: Ar *3: Re	ink cell ithmetic sults of	s are lo c Avera f the an	cations ige; cak alysis o	where culated of trend	sample by ass s at res	es were uming l spective	not co ND=0; locatio	llected. Color c ms usir	The re odes sl	sult "N now ca nethod	ot dete tegories explain	ctable" (see tl ed on 4	is indic he right .3(1) 2	ated as).)	"0." >> I	Decreasi	ng -	→ Ind	A	в	C Uncl	D	E	A Fluctuations	138	Average		

4) Ibaraki Prefecture

In Ibaraki Prefecture, surveys were conducted 23 to 25 times from October 2011 to February 2017 for coastal area sediment samples collected at five locations.

Regarding the concentration levels of detected values, all five locations were categorized into Category E (see Table 4.3-41 and Table 4.3-42).

Concentration levels were generally decreasing at three locations and fluctuating at two locations.

Table 4.3-41 Categorizations of detected values at respective locations (Ibaraki Prefecture: coastal area sediments)

	·		
Category	Percentile (percentile in all detected values)	Number of locations	Locations
А	Upper 5 percentile	0	(None)
В	Upper 5 to 10 percentile	0	(None)
С	Upper 10 to 25 percentile	0	(None)
D	Upper 25 to 50 percentile	0	(None)
Е	Upper 50 to 100 percentile (lower 50%)	5	No. 1, No. 2, No. 3, No. 4, No. 5





Table 4.3-42 Detection of radioactive cesium at respective locations

						`																'
	Location				Coasta	ıl area	sedin	nents/I	Radioa	ctive (esiun	ı (Cs-1	134+0	(s-137)	/Conc	entrati	ion(Bq	/kg)(*	1)			
N	Leader				FY201	1									1	FY2012	2					
INO.	Location	8	9	10	11	12	1	2	3	4	5	6		7	8	9	10	11	12	1	2	3
1	Offshore of Satone River Estuary			80				94				53					52	0	29		0	
2	Offshore of Okita River Estuary			173				165				52					18	17	30		34	
3	Offshore of Momiya River/Kujigawa River Estuaries			155				230				64	6	0	69		32	12	14		49	
4	Neighboring water body of Ken-o Offshore of Nakagawa River			10				11				0	()	0		0	0	0		0	
5	Offshore of Tonegawa River Estuary			21				12					17	25	0		0	0	0			0
		total nu sam	mber of ples	121	Dete tin	ction ies	63															
		*1: Blank	c cells are	locati	ons wh	ere sar	nples v	were no	ot colle	cted. T	he res	ult "No	ot detec	table"	is indic	ated as	"0."					

(Ibaraki Prefecture: coastal area sediments)

	Location						Coasta	l area	sedim	ents/R	adioac	tive C	esium	(Cs-1	34+C	s-137)	/Conce	ntrati	on(Bq	/kg)(*	1)						
N	N. Londin		FY2013													FY2014											
INO.	Location	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
1	Offshore of Satone River Estuary			35		41			53			67			14			27			25			25			
2	Offshore of Okita River Estuary			42		28			0			13			13			0			10			11			
3	Offshore of Momiya River/Kujigawa River Estuaries			14		42			0			11			15			13			63			67			
4	Neighboring water body of Ken-o Offshore of Nakagawa River			11		0			0			0			0			0			0			0			
5	Offshore of Tonegawa River Estuary			0		0			0			0			0			0			0			0			
		*1: Bl	ank cel	lls are l	locatior	is whe	re sam	ples we	ere not	collect	ied. Th	e resul	t "Not	detecta	able" is	indica	ted as '	°0."									

Location							Coastal area sediments/Radioactive Cesium (Cs-134+Cs-137)/Concentration(Bq/kg)(*1)														Average of									
No	Location		FY2015 FY2016 Changes												FY2016	No.	coefficient of variation	Trends (*3)												
140.		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	changes	(*2)		or variation	(1)
1	Offshore of Satone River Estuary		31			24			15			43			29				36		30			30		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	31	1	0.63	\sim
2	Offshore of Okita River Estuary		0			0			0			0			49				0		0			0		\sum	12	2	1.66	/
3	Offshore of Momiya River/Kujigawa River Estuaries		13			23			17			178			0				0		25			0		hand	6.3	3	1.26	\sim
4	Neighboring water body of Ken-o Offshore of Nakagawa River		0			0			0			0			0				0		0			0		11	0	4	2.77	\searrow
5	Offshore of Tonegawa River Estuary			0			0		0			0				0			0			0		0		Ч	0	5	2.43	/
	*1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0." A B C D E 10 Average																													
	*2: Arithmetic Average; calculated by assuming ND=0; Color codes show categories (see the right).																													
	*3: Results of the analysis of trends at respective locations using the method explained on 4.3(1) 2) 🦄 Decreasing 🛹 Increasing 🗸 Unchanged 👭 Flactuations																													

5) Chiba Prefecture and Tokyo Metropolis

In Chiba Prefecture and Tokyo Metropolis, surveys were conducted 21 to 36 times from May 2012 to February 2017 for coastal area sediment samples collected at eight locations in total.

Regarding the concentration levels of detected values, one location was categorized into Category C, three locations were categorized into Category D and four locations were categorized into Category E (see Table 4.3-43 and Table 4.3-44).

Concentration levels were generally decreasing at five locations and fluctuating at three locations.

Category	Percentile (percentile in all detected values)	Number of locations	Locations					
А	Upper 5 percentile	0	(None)					
В	Upper 5 to 10 percentile	0	(None)					
С	Upper 10 to 25 percentile	1	No. 6					
D	Upper 25 to 50 percentile	3	No. 3, No. 7, No. 8					
Е	Upper 50 to 100 percentile (lower 50%)	4	No. 1, No. 2, No. 4, No. 5					

Table 4.3-43 Categorizations of detected values at respective locations (Chiba Prefecture and Tokyo Metropolis: coastal area sediments)



Note: 1) For locations where surveys were conducted multiple times in one month, their average value is used in the figures. Figure 4.3-23 Changes in concentration levels over the years at respective locations (Chiba Prefecture and Tokyo Metropolis: coastal area sediments)
Table 4.3-44 Detection of radioactive cesium at respective locations (Chiba Prefecture and Tokyo Metropolis: coastal area sediments)

		Location				Coa	istal ai	rea se	limen	ts/Rad	lioacti	ve Ces	ium (Cs-134	+Cs-	137)/0	Concer	ntratio	n(Bq/l	(*1)		
	D. C. I.						FY20	11									FY2	2012					
No.	Prefecture	1	.ocation	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		Tokyo Bay 7	Offshore of Yorogawa River Estuary											0				15	0	15		21	
2		Tokyo Bay 5	Offshore of Miyako River Estuary											17				15	27	59		33	
3	Chiba Prefecture	Coastal sea area of Makuhari	Offshore of Inbanuma Discharge Channel											0		35	10	0	16	27		26	
4		Approx. 1 km offshore of Ebigawa River Estuary	Channel I km offshore of River Estuary Coastal area of Keiyo Port (Ebigawa											134		0	0	60	12	0		0	
5		Approx. 1 km offshore of Edogawa River Estuary	River Estuary)											37		14	31	13	0	0		0	
6		Approx. 1 km offshore of Kyu- Edogawa River Estuary	Offshore of Kyu-Edogawa River Estuary															380		780		710	
7	Tokyo Metropolis	St-8	Offshore of Arakawa River/Kyu- Edogawa River Estuaries										490	440	380	400	440	420		320		410	
8		Southwestern area of Toyosu Wharf	Offshore of Sumida River Estuary										16	11	0	29	0	72		49		126	
				total nu sam	mber of ples	214	Dete tin	ction 1es	158														
				*1: Blan	ik cells a	re loca	tions w	where s	ample	s were	not co	ollected	l. The	result '	'Not de	etec tab	le" is i	ndicate	d as "()."			

		Location						С	oastal	area	edime	nts/R:	adioac	tive C	esium	(Cs-1	34+C	s-137)	/Conc	entrat	ion(B	¶/kg)('	P1)				
N.	Desfeature								FY.	2013											FY.	2014					
INO.	Freiecture		Location	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		Tokyo Bay 7	Offshore of Yorogawa River Estuary			0		0			11		11					11			11			0		0	
2		Tokyo Bay 5	Offshore of Miyako River Estuary			19		30			19		21					21			20			21		20	
3	Chiba Prefecture	Coastal sea area of Makuhari	Offshore of Inbanuma Discharge Channel			0	17	52	15	36	47		23					14	11	0	14	16		14		19	
4		Approx. 1 km offshore of Ebigawa River Estuary	Coastal area of Keiyo Port (Ebigawa			0		0			0		0					13			0			0		0	
5		Approx. 1 km offshore of Edogawa River Estuary	River Estuary)			38		0			54		0					19			0			0		0	
6		Approx. 1 km offshore of Kyu- Edogawa River Estuary	Offshore of Kyu-Edogawa River Estuary			226	450	550	580	193	580			780			630	500	375	168	409		237			0	
7	Tokyo Metropolis	St-8	Offshore of Arakawa River/Kyu- Edogawa River Estuaries			97	330	330	332	370	294			354			311	330	370	309	278		257			255	
8		Southwestern area of Toyosu Wharf	Offshore of Sumida River Estuary			12		100			30			118			18			62			49			109	
				*1: B	lank ce	lls are	locatio	ns whe	ere san	nples v	ere no	t colle	cted. T	The res	ult "N	ot dete	ctable"	is indi	cated a	1s "0."							

		Location								Co	astal a	rea se	dimen	ts/Ra	lioacti	ve Ce	sium (Cs-13	4+Cs	-137)/	Conce	ntrati	on(Bq	/kg)(*	1)					Average of			
No	Profesture		opation							FY201:	5											FY.	2016						Changer	FY2016	No.	coefficient of variation	Trends (*3)
140	Trefecture	1	cie anon	4	5	6	7	8		9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	Changes	(*2)			
1		Tokyo Bay 7	Offshore of Yorogawa River Estuary			0				0			0		0				0			0			0		0		M	0	1	1.52	\nearrow
2		Tokyo Bay 5	Offshore of Miyako River Estuary			17				18			17		0				12			0			15		0		Y	6.8	2	0.66	Ļ
3	Chiba Prefecture	Coastal sea area of Makuhari	Offshore of Inbanuma Discharge Channel			0	17	11		17	17		0		17				12	22	52	46	71		0		58		mm	37	3	0.87	MM
4		Approx. 1 km offshore of Ebigawa River Estuary	Coastal area of Keiyo Port (Ebigawa			0				0			0		0				0			0			0		0		h	0	4	3.15	\nearrow
5		Approx. 1 km offshore of Edogawa River Estuary	River Estuary)			0			1	123			99		315				37			23			0		17		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	19	5	1.93	\sim
6		Approx. 1 km offshore of Kyu- Edogawa River Estuary	Offshore of Kyu-Edogawa River Estuary		410	267	109		266	335		198			197			269	304	268	265	263		250			264		Mm-	269	6	0.54	/
7	Tokyo Metropolis	St-8	Offshore of Arakawa River/Kyu- Edogawa River Estuaries		180	195	280		248	234		322			230			210	202	192	180	171		250			159		March	195	7	0.32	\nearrow
8		Southwestern area of Toyosu Wharf	Offshore of Sumida River Estuary		83			110				89			84			89			81			129			84		Mm-r	96	8	0.65	MM
*1: Blank cells are locations where samples were not collected. The result "Not detectable" is indicated as "0." A B C D E												78	Average																				
	*2: Arithmetic Average; calculated by assuming ND=0; Color codes show categories (see the right).																																
		*3: Results of the analysis of trends at respective locations using the method explained on 4.3(1) 2) 🍾 Decreasing 🛹 Unchanged MAPAcuations																															

(3) Conclusion

The concentration levels of detected values for sediment samples from public water areas (rivers, lakes, and coastal areas) from FY2011 to FY2016 and their changes shown so far are summarized as follows (see Figure 4.3-24 and Table 4.3-45).

1) Concentration levels of detected values

Rivers

Out of all surveyed locations (396 locations), the number categorized into Categories A and B, which fall under the upper 10%, was the largest in Hamadori in Fukushima Prefecture (18 locations). Other such locations were also found in Nakadori and Aizu in Fukushima Prefecture, Ibaraki Prefecture, Gunma Prefecture and Chiba Prefecture.

Lakes

Out of all surveyed locations (164 locations), locations categorized into Category A or B were found in Hamadori in Fukushima Prefecture.

Coastal areas

Out of all surveyed locations (42 locations), locations categorized into Category A or B were found in Miyagi and Fukushima Prefectures.



Figure 4.3-24 Categorizations by concentration levels of detected values for sediment samples

(upper: rivers; middle: lakes; lower: coastal areas)

(* Figure 4.3-24 shows the aforementioned Table 3.1-1 graphically.)

2) Changes in detected values

Rivers

A decreasing trend was observed at most locations.

Lakes

Detected values were generally decreasing or unchanged at most locations but some locations showed fluctuations.

· Coastal areas

A decreasing trend was observed at most locations but some locations showing fluctuations.

Table 4.3-45 Changes in detected values for sediment samples from public water areas (rivers, lakes, and coastal areas)

<rivers></rivers>	>												
						N	umber of l	ocations					
Trends				Fukushima	ı							To	otal
Decreasing	Iwate	Miyagi	Hamadori	Nakadori	Aizu	Ibaraki	Tochigi	Gunma	Chiba	Saitama	Tokyo	Number of locations	Percentage
Decreasing	19	35	49	42	20	46	40	32	38	2	1	324	81.8
Unchanged	0	0	1	0	0	2	0	1	1	0	1	6	1.5
Fluctuations	3	8	3	2	6	5	16	15	8	0	0	66	16.7
Increasing	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	22	43	53	44	26	53	56	48	47	2	2	396	100.0

<Lakes>

					Number	of locations				
Trends			Fukushima						То	otal
Decreasing	Miyagi	Hamadori	Nakadori	Aizu	Ibaraki	Tochigi	Gunma	Chiba	Number of locations	Percentage
Decreasing	12	21	5	8	9	2	10	7	74	45.1
Unchanged	3	4	2	4	6	0	6	1	26	15.9
Fluctuations	6	15	5	13	4	4	7	0	54	32.9
Increasing	0	1	0	6	0	2	1	0	10	6.1
Total	21	41	12	31	19	8	24	8	164	100.0

<Coastal areas>

				Number	of locations			
Trends							Te	otal
	Iwate	Miyagi	Fukushima	Ibaraki	Chiba	Tokyo	Number of locations	Percentage
Decreasing	0	3	10	3	3	2	21	50.0
Unchanged	1	1	1	0	0	0	3	7.1
Fluctuations	1	7	4	2	2	1	17	40.5
Increasing	0	1	0	0	0	0	1	2.4
Total	2	12	15	5	5	3	42	100.0

3) Summary by prefecture

Concentration levels of detected values and their changes are summarized by prefecture as follows (see Figures 4.3-25 to 4.3-27).

- (i) Iwate Prefecture
 - For rivers, all the 22 surveyed locations were categorized into either Category D or E. A decreasing trend was observed at most locations.
 - For coastal areas, the two surveyed locations were categorized into Category E. An unchanged trend was observed at most locations except for some locations that showed fluctuations.
- (ii) Miyagi Prefecture
 - For rivers, of the 43 surveyed locations, some locations in the lower reaches were categorized into Category C, but over 80% of the surveyed locations were categorized into Category D or E. A decreasing trend was observed at most locations.
 - For lakes, of the 21 surveyed locations, most locations were categorized into Category D or E, while one location was categorized into Category C. Concentration levels were generally decreasing or unchanged except for some locations that showed fluctuations.
 - For coastal areas, approximately 70% of the 12 surveyed locations were categorized into Category D or E, rest of them were categorized into Category A, B or C. There was a location categorized into Category A in the Sendai Port. Although concentration levels were fluctuating at some locations, most other locations showed decreasing or unchanged trends.
- (iii) Hamadori, Fukushima Prefecture
 - For rivers, approximately 60% of the 53 surveyed locations were categorized into Category A, B or C.
 - Many locations categorized into Category A or B were found near to or northwest of Fukushima Daiichi NPS, while locations categorized into Category C were seen in the northern and southern parts of the district. A decreasing trend was observed at most locations.
 - For lakes, approximately 70% of the 41 surveyed locations were categorized into Category A, B or C.
 - Many locations categorized into Category A or B were found northwest of Fukushima Daiichi NPS. A decreasing or unchanged trend was observed generally except for some locations that showed fluctuations.
 - For coastal areas, approximately 70% of the 15 surveyed locations were categorized into Category D or E, and the rest were categorized into Category A, B, or C. One location categorized into Category A was seen in Onahama port. A decreasing trend was generally observed except for some locations that showed fluctuations.

(iv) Nakadori, Fukushima Prefecture

- For rivers, more than 70% of the 44 surveyed locations were categorized into Category D or E, and the rest were categorized into Category B or C. The locations categorized into Category B or C were found between the center and the northern part of the Abukuma River system. A decreasing trend was observed at most locations.
- For lakes, eight of the 12 surveyed locations were categorized into Category D or E, and the remaining four locations were categorized into Category C. The locations categorized into Category C were seen in the

upper and lower reaches of the Abukuma River basin. A decreasing or unchanged trend was generally observed except for some locations that showed fluctuations.

- (v) Aizu, Fukushima Prefecture
 - For rivers, one of the 26 surveyed locations was categorized into Category B, one location was categorized into C, and all the remaining locations were categorized into Category D or E. A decreasing trend was observed at most locations.
 - For lakes, seven of the 31 surveyed locations were categorized into Category C, and approximately 80% of the locations were categorized into Category D or E. Although concentration levels were fluctuating at some locations, decreasing or unchanged trends were observed at rest of the locations.
- (vi) Ibaraki Prefecture
 - For rivers, approximately 70% of the 53 surveyed locations were categorized into Category D or E, and the rest were categorized into Category A, B, or C. The locations categorized into Category A or B were found in rivers flowing into Lake Kasumigaura. A decreasing trend was observed at most locations.
 - For lakes, out of the 19 surveyed locations, one in the northern part of the prefecture was categorized into Category C, and the remaining locations were categorized into Category D or E. A decreasing or unchanged trend was observed at most locations.
 - For coastal areas, all the five surveyed locations were categorized into Category E. A decreasing trend was generally observed at most locations except for some locations that showed fluctuations.
- (vii) Tochigi Prefecture
 - For rivers, one of the 56 surveyed locations was categorized into Category C, and the remaining locations were categorized into Category D or E. A decreasing trend was generally observed except for some locations that showed fluctuations.
 - For lakes, all eight locations were categorized into Category D or E. Concentration levels were fluctuating at many of the locations, and rest of the locations showed a variety of trends.
- (viii) Gunma Prefecture
 - For rivers, of the 48 surveyed locations, some locations in the lower reaches of the Watarase River basin were categorized into Category B, and all the remaining locations were categorized into Category D or E. A decreasing trend was generally observed except for some locations that showed fluctuations.
 - For lakes, all the 24 surveyed locations were categorized into Category D or E. Although concentration levels were fluctuating at some locations, decreasing or unchanged trends were generally observed.
- (ix) Chiba and Saitama Prefectures and Tokyo Metropolis
 - For rivers, over 60% of the 51 surveyed locations were categorized into Category A, B, or C. The locations categorized into Category A or B were found in rivers flowing into Lake Teganuma or Lake Inbanuma, the Edogawa River system and a part of the Tonegawa River system. A decreasing trend was observed at most locations.
 - For lakes, one of the eight surveyed locations, in Lake Teganuma, was categorized into Category C, and all the remaining locations were categorized into Category D or E. A decreasing trend was observed at most locations.

• For coastal areas, one of the eight surveyed locations, the mouth of the Kyuedogawa River, was categorized into Category C, and all remaining locations were categorized into Category D or E. A decreasing trend was observed at most locations except for some locations that showed fluctuations.





(*) Categories A to E show relative concentration levels for river sediment samples and cannot be compared with those for lake sediment samples or coastal area sediment samples.



Figure 4.3-26 Categorization of and changes in concentration levels for lake sediment samples from public water areas

(*) Categories A to E show relative concentration levels for lake sediment samples and cannot be compared with those for river sediment samples or coastal area sediment samples.





(*) Categories A to E show relative concentration levels for coastal area sediment samples and cannot be compared with those for river sediment samples or lake sediment samples.

5 Results (Radionuclides Other than Radioactive Cesium)

5.1 Radioactive strontium (Sr-90 and Sr-89)

(1) Public water areas

1) Outline

In principle, radioactive strontium was measured at locations where the radioactive cesium concentration in the sediments was high. Sediment samples from public water areas (rivers, lakes, and coastal areas) were surveyed for Sr-90 from FY2011 to FY2016, and those from public water areas (rivers and lakes) for Sr-89 in FY2011, respectively. The status of the survey and the summary of the survey results are as shown in Table 5.1-1 (detection limits: approx. 1 Bq/kg for Sr-90, and approx. 2 Bq/kg for Sr-89).

In addition, in FY2016, Sr-90 was surveyed (detection limit: approx. 1Bq/L for Sr-90 in water) for 45 water samples collected on the same day at the same locations (two locations in Miyagi, 32 locations in Fukushima, two locations in Ibaraki and eight locations in Gunma) where Sr-90 was detected at 1.0 Bq / kg or more in public water areas (lakes).

The detection status by medium for Sr-90 is as shown in 2) and 3).

Although a single survey was conducted for Sr-89 on 22 samples (13 river sediment samples and nine lake sediment samples) in FY2011, Sr-89 was not detectable in any of them.

2) Detection of Sr-90 in sediment samples

(i) River sediments

Sr-90 was detected in 12 out of 23 river sediments samples surveyed in FY2016 (detection rate: 52.2%). Detected values were less than 1 Bq/kg (see Table 5.1-1).

Sr-90 has been continuously detected since FY2011 at some locations in Ota River and Ukedo River in Fukushima Prefecture, but the detected values have gradually decreased to fall below 2 Bq/kg from FY2014 on (see Figure 5.1-1).

(ii) Lake sediments

In FY2016, 66 lake sediments samples were surveyed for Sr-90; Sr-90 was detected in 65 samples (detection rate: 98.5%) (see Table 5.1-1). Sr-90 has been continuously detected until FY2016 in each prefecture surveyed. When reviewed location by location, detected values have basically been at relatively low levels, and the range of measured values in FY2016 was from not detectable to 100 Bq/kg(see Figure 5.1-1).

(iii) Coastal area sediments

In FY2016, 32 coastal area sediment samples were surveyed; Sr-90 was detected in two samples collected in Fukushima Prefecture (detection rate: 6.3%) (see Table 5.1-1). Measured values ranged from not detectable to 0.38 Bq/kg, which were lower values than those obtained from rivers and lakes.

3) Detection of Sr-90 in water

Surveys on 45 water samples, which were collected on the same day from the same public water area (lakes)

sediments where Sr-90 was detected at 1.0 Bq/kg or more, were conducted. Sr-90 was not detectable at any surveyed locations even in measurements at the lower limit value (0.032 to 0.047 Bq/L) which was even lower than 1 Bq/L.

Table 5.1-1 Detection of Sr-90 and Sr-89 in sediment samples from public water areas (rivers, lakes, and coastal areas)

o Sr-90

o Sr-89

				FY2011						FY2012						FY2013						FY2014			
Property	Prefecture	Number of samples	Detection times	Detection rate (%)	Range valu	of mea 1es (Bq	isured /kg)	Number of samples	Detection times	Detection rate (%)	Range val	e of meas ues (Bq/	sured kg)	Number of samples	Detection times	Detection rate (%)	Range val	e of mea 1es (Bq	sured /kg)	Number of samples	Detection times	Detection rate (%)	Range valu	of mea ies (Bq	sured /kg)
	Miyagi	2	2	100.0	0.40	-	1.10	7	1	14.3	ND	-	1.2	5	3	60.0	ND	-	0.56	4	3	75.0	ND	-	0.52
	Fukushima	7	7	100.0	1.2	-	4.1	25	15	60.0	ND	-	12	16	10	62.5	ND	-	2.9	14	9	64.3	ND	-	1.5
	Ibaraki	1	1	100.0	1.6	-	1.6	4	1	25.0	ND	-	1.8	6	4	66.7	ND	-	1.8	6	2	33.3	ND	-	0.89
Rivers	Tochigi	1	1	100.0	1.3	-	1.3	2	0	0.0		ND		2	1	50.0	ND	-	0.23	2	1	50.0	ND	-	0.53
	Gunma	1	1	100.0	0.70	-	0.70	2	0	0.0		ND		2	1	50.0	ND	-	0.44	1	0	0.0		ND	
	Chiba	1	1	100.0	1.1	-	1.1	4	0	0.0		ND		4	2	50.0	ND	-	0.49	4	1	25.0	ND	-	0.40
	Total	13	13	100.0	0.40	-	4.1	44	17	38.6	ND	-	12	35	21	60.0	ND	-	2.9	31	16	51.6	ND	-	1.5
	Miyagi	1	1	100.0	1.6	-	1.6	3	2	66.7	ND	-	2.1	5	5	100.0	0.30	-	2.2	6	5	83.3	ND	-	0.96
	Fukushima	3	3	100.0	3.3	-	6.8	41	41	100.0	2.1	-	93	40	40	100.0	0.70	-	55	39	39	100.0	0.70	-	50
	Ibaraki	2	2	100.0	0.70	-	3.3	6	1	16.7	ND	-	7.0	6	5	83.3	ND	-	5.2	6	6	100.0	0.57	-	3.0
Lakes	Tochigi	1	1	100.0	1.3	-	1.3	2	1	50.0	ND	-	1.6	2	2	100.0	0.74	-	0.93	2	2	100.0	1.0	-	1.1
	Gunma	1	1	100.0	2.0	-	2.0	2	2	100.0	1.9	-	2.2	2	1	50.0	ND	-	1.7	2	2	100.0	1.5	-	1.7
	Chiba	1	1	100.0	1.4	-	1.4	4	1	25.0	ND	-	4.4	2	1	50.0	ND	-	1.8	4	3	75.0	ND	-	2.5
	Total	9	9	100.0	0.70	-	6.8	58	48	82.8	ND	-	93	57	54	94.7	ND	-	55	59	57	96.6	ND	-	50
	Miyagi	0	0	-		-		2	0	0.0		ND		4	0	0.0		ND		2	0	0.0		ND	
Coastal	Fukushima	0	0	-		-		21	0	0.0		ND		30	1	3.3	ND	-	0.33	30	2	6.7	ND	-	0.58
areas	Tokyo	0	0	-		-		2	0	0.0		ND		0	0	-		-		0	0	-		-	
	Total	0	0	-		-		25	0	0.0		ND		34	1	2.9	ND	-	0.33	32	2	6.3	ND	-	0.58

	Ri	ver	La	ke
Prefecture	Number of samples	Detection times	Number of samples	Detection times
Miyagi	2	0	1	0
Fukushima	7	0	3	0
Ibaraki	1	0	2	0
Tochigi	1	0	1	0
Gunma	1	0	1	0
Chiba	1	0	1	0
Total	13	0	9	0

				FY2015						FY2016					Tota	ıl		
Property	Prefecture	Number of samples	Detection times	Detection rate (%)	Range valu	of mea ies (Bq	sured /kg)	Number of samples	Detection times	Detection rate (%)	Range valu	of mea ies (Bq	sured /kg)	Number of samples	Detection times	Range valu	of mea ies (Bq.	sured (kg)
	Miyagi	2	0	0.0		ND		2	1	50.0	ND	-	0.43	22	10	ND	-	1.2
	Fukushima	10	5	50.0	ND	-	1.9	10	4	40.0	ND	-	0.68	82	50	ND	-	12
	Ibaraki	4	2	50.0	ND	-	0.92	4	3	75.0	ND	-	0.69	25	13	ND	-	1.8
Rivers	Tochigi	1	0	0.0		ND		0	0	-		-		8	3	ND	-	1.3
	Gunma	0	0	-		-		0	0	-		-		6	2	ND	-	0.70
	Chiba	5	2	40.0	ND	-	0.35	7	4	57.1	ND	-	0.53	25	10	ND	-	1.1
	Total	22	9	40.9	ND	-	1.9	23	12	52.2	ND	-	0.69	168	88	ND	-	12
	Miyagi	8	7	87.5	ND	-	1.4	8	7	87.5	ND	-	1.3	31	27	ND	-	2.2
	Fukushima	40	39	97.5	ND	-	150	35	35	100.0	0.63	-	100	198	197	ND	-	150
	Ibaraki	6	6	100.0	0.34	-	2.6	6	6	100.0	0.33	-	2.5	32	26	ND	-	7.0
Lakes	Tochigi	2	2	100.0	0.47	-	2.2	2	2	100.0	0.92	-	2.0	11	10	ND	-	2.2
	Gunma	8	8	100.0	0.67	-	2.4	11	11	100.0	0.71	-	2.6	26	25	ND	-	2.6
	Chiba	4	4	100.0	0.36	-	0.61	4	4	100.0	0.43	-	0.75	19	14	ND	-	4.4
	Total	68	66	97.1	ND	-	150	66	65	98.5	ND	-	100	317	299	ND	-	150
	Miyagi	2	0	0.0		ND		2	0	0.0		ND		12	0		ND	
Coastal	Fukushima	30	3	10.0	ND	-	0.78	30	2	6.7	ND	-	0.38	141	8	ND	-	0.78
areas	Tokyo	0	0	-		-		0	0	-		-		2	0		ND	
	Total	32	3	9.4	ND	-	0.78	32	2	6.3	ND	-	0.38	155	8	ND	-	0.78



Figure 5.1-1 Detection of Sr-90 in sediment samples from public water areas (upper: rivers; lower: lakes)

(2) Groundwater

Surveys for Sr-89 and Sr-90 were conducted on approximately 240 groundwater samples collected in Fukushima Prefecture between January 2012 and February 2017.

An outline of these survey results is as shown in Table 5.1-2. Detected values of Sr-89 and Sr-90 were all below the detection limit (1 Bq/L).

Table 5.1-2 Detection of Sr-89 and Sr-90 in	groundwater samples	s (all collected in Fukushima Prefecture)
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			Sr-90				Sr-89	
Fiscal Year	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L) (*1)	Number of samples	Detection times	Detection rate (%)	Range of measured values (Bq/L) (*1)
FY2011	8	0	0.0	ND	8	0	0.0	ND
FY2012	60	0	0.0	ND	60	0	0.0	ND
FY2013	77	0	0.0	ND	77	0	0.0	ND
FY2014	48	0	0.0	ND	48	0	0.0	ND
FY2015	48	0	0.0	ND	48	0	0.0	ND
FY2016	48	0	0.0	ND	48	0	0.0	ND
Total	289	0	0.0	ND	289	0	0.0	ND

*1:Results were compiled by setting the detection limit at 1 Bq/L. Additionally, the detection limit of Sr-90 was 0.0002Bq/L in FY2011, and 1Bq/L thereafter, and similarly, the detection limit of Sr-89 was 0.001 Bq/L in FY2011, and 1 Bq/L thereafter.

In the FY2011 survey (calendar year 2012), Sr-90 was detected in all eight samples, with detected values ranging from 0.0004 to 0.0029 Bq/L. Similarly, while the detection limit for Sr-89 was 0.001 Bq/L in FY2011 (calendar year 2012), Sr-89 in all eight samples was below the detection limit.

5.2 Other γ-ray emitting radionuclides

Apart from the aforementioned radionuclides (Cs-134, Cs-137, Sr-89 and Sr-90), measurement results for water samples and sediment samples using a germanium semiconductor detector were analyzed from FY2011 to FY2016 to obtain activity concentrations of accident-derived radionuclides (Ag-110m, Te-129m, Nb-95, Sb-125 and Ce-144, etc.¹⁰) and major naturally occurring radionuclides such as K-40. The summary of the results is as shown in Table 5.2-1 and Table 5.2-2.

Among the detected radionuclides, no artificial radionuclides were detected in water samples, while two types of radionuclides, Ag-110m and Sb-125, were detected in sediment samples with detection rates of 1% or less. Since FY2013, neither radionuclide has been detected.

Although six naturally occurring radionuclides (K-40, Pb-212, Pb-214, Tl-208, Ac-228 and Bi-214) were detected, K-40 is a naturally occurring radionuclide entrained during the Earth's formation, while the other species are all either uranium series or thorium series radionuclides, which are widely distributed in nature including the Earth's crust.

Fiscal	Number	Major det	tected artificial radionuclide	Major detected	naturally occurring
year	of samples	Nuclide	Detection rate and detected values	Nuclide	Detection rate
FY2011	1,755	-	-	K-40	10%
FY2012	3,518	-	-	K-40	6%
FY2013	3,860	-	-	K-40	13%
FY2014	3,856	-	-	K-40	10%
				Pb-214	9%
FY2015	3,916	-	-	Pb-212	7%
				K-40	7%
				Pb-214	17%
FY2016	3,890	-	-	Pb-212	10%
				K-40	8%

Table 5.2-1 Detection of other radionuclides (Water)

¹⁰ Among the accident-derived radionuclides, I-131 was investigated in water samples from public water areas (3,111 river water samples, 1,416 lake water samples, and 715 coastal area water samples) and sediment samples (3,073 river sediment sample, 877 lake sediment samples, and 393 coastal area sediment samples) from FY 2011 to FY 2012, and in groundwater samples (3,793 samples) from FY 2011 to FY 2014. In none of these samples was I-131 detected (detection limit values: 1 Bq/L for water and 10 Bq/kg for sediments).

	Number	Major det	tected artificial radionuclide	Major detected naturally occurring			
Fiscal year	of			radionuclide			
, , , , , , , , , , , , , , , , , , ,	samples	Nuclide	Detection rate and detected values	Nuclide	Detection rate		
				K-40	79%		
EV2011	1.550	A = 110m	4 samples (0.26%)	Pb-212	41%		
F 1 2011	1,559	Ag-110m	46 - 170 Ba/kg	Pb-214	16%		
				T1-208	14%		
			$26 \text{ somm}\log(0.00\%)$	Ac-228	41%		
		Ag-110m	26 samples (0.90%)	Bi-214	43%		
EV2012	2 005		7.9 - 350 Bq/kg	K-40	97%		
F12012	2,003		2 complete (0.100%)	Pb-212	75%		
		Sb-125	5 samples (0.10%)	Pb-214	44%		
			140 - 420 Bq/kg	T1-208	39%		
		-		Ac-228	25%		
				Bi-214	25%		
EV2012	2.0(2			K-40	91%		
FY2013	3,062		-	Pb-212	49%		
				Pb-214	23%		
				T1-208	23%		
				Ac-228	24%		
	3,035			Bi-214	24%		
EV2014				K-40	91%		
F I 2014		-	-	Pb-212	48%		
				Pb-214	24%		
				T1-208	24%		
				Ac-228	32%		
				Bi-214	60%		
EV2015	2 1 5 9			K-40	88%		
F 1 2015	5,158	-	-	Pb-212	63%		
				Pb-214	67%		
				T1-208	37%		
				Ac-228	35%		
				Bi-214	66%		
EV2016	2,000			K-40	92%		
FY2016	3,088	-	-	Pb-212	64%		
				Pb-214	75%		
					T1-208	40%	

Table 5.2-2 Detection of other radionuclides (Sediments)

Note: detection limits of artificial radionuclides: 7 - 180 Bq/kg for Ag-110m, and 130 - 330 Bq/kg for Sb-125

Part 3: Other Radioactive Material Monitoring Conducted Nationwide (FY2016)

1 Outline of the Monitoring

1.1 Covered monitoring

As other radioactive material monitoring activity conducted nationwide, the results of the Monitoring of Environmental Radioactivity Levels in FY2016, which was conducted in FY2016 by the Nuclear Regulation Authority for the purpose of clarifying the existence or nonexistence of the influence of nuclear facilities, etc. nationwide, are compiled here.

Monitoring locations are as shown in Table 1.1-1 and Figure 1.1-1. See the relevant website for more details. (http://www.env.go.jp/air/rmcm/result/nsr.html)

1.2 Compilation methods

Measurement data are available on the website of Environmental Radioactivity and Radiation in Japan.¹¹

Data for this report were collected from this website under the following search criteria.

- (i) Period: April 2016 to March 2017 (Published on Feb 14, 2018)
- (ii) Coverage: Nationwide
- (iii) Targets: All radionuclides
- (iv) Targeted samples: Inland water (river water, lake water, freshwater), seawater, sediments (river sediments, sea sediments)

¹¹ Environmental Radioactivity and Radiation in Japan "Environmental Radiation Database" http://search.kankyo-hoshano.go.jp/servlet/search.top. (Japanese only, accessed Feb 14, 2018)

No.	Prefecture	Property	Sampling locations	Water	Sediments
1	TT 11 '1	Lake	Oyafuru, Ishikari City (Lake Barato)	0	-
2	Ноккаїдо	Coastal area	Yoichi Town, Yoichi County (Yoichi Bay)	0	0
3	A	Coastal area	Fukaura Town, Nishitsugaru County (off Kasose)	0	0
4	Aomori	Coastal area	Hiranai Town, Higashitsugaru County (Mutsu Bay)	0	0
5	Iwate	Coastal area	Hirono Town, Kunohe County (off Taneichi)	0	0
6	Akita	River	Asahikawa, Akita City	0	-
7		Coastal area	Soma City (off Haragama Beach)	0	0
8	Fukusnima	River	Zainiwasaka, Fukushima City	0	-
9	TI 1'	Lake	Kasumigaura	0	-
10	Ibaraki	Coastal area	Tokai Village, Naka County (off the NPS)	0	0
11	Chiba	Coastal area	Tokyo Bay (off Sodegaura City)	0	0
12	Kanagawa	Coastal area	Yokosuka City (Odawa Bay)	0	0
13		Lake	Shichikuyama, Chuo Ward, Niigata City		-
14	Niigata	Coastal area	off Niigata Port	0	0
15	Fukui	Lake	Inogaike Pond, Tsuruga City	0	-
16	Nagano	Lake	Lake Suwa	0	-
17	Aichi	Coastal area	Tokoname City (off Kosugaya)	0	0
18	Mie	River	Seki Town, Kameyama City (Suzuka River)	0	-
19	Kyoto	Freshwater	Tenno, Ogura Town, Uji City	0	-
20	Osaka	Coastal area	Osaka City (Entrance to Osaka Port)	0	0
21		River	Katamo (Katamo River System)	0	0
22		River	Kawakami (Kawakami River System)	0	0
23	Tottori	River	Hotani (Iwakura River System)	0	0
24		River	Bessho (except for Katamo River System)	0	0
25		River Kannokura (Oshika River System)		0	0
26	Hiroshima	River	Kawate Town, Shobara City (Saijo River)	0	-
27	Yamaguchi	Coastal area	Ajisu, Yamaguchi City (Yamaguchi Bay)	0	0
28	Fukuoka	Coastal area	Higashiminato Town, Moji Ward, Kitakyushu City (off Chichisaki)	0	0
29	Kagoshima	Coastal area	Minamisatsuma City (off the mouth of Manose River)	0	0
30	Okinawa	Coastal area	Katsuren White Beach, Uruma City	0	0

Table 1.1-1 Locations for the Monitoring of Environmental Radioactivity Levels (30 in total)



Figure 1.1-1 Locations for the Monitoring of Environmental Radioactivity Levels

2 Results

2.1 Water

(1) Inland water¹²

In the Monitoring of Levels in FY2016, inland water samples were reported for 9 radionuclides (Be-7, K-40, U-234, U-235, U-238, Cs-134, Cs-137, I-131 and Sr-90), as shown in Table 2.1-1.

A comparison with the results of the Monitoring of Levels for the last twenty years (excluding data from March 11, 2011, to March 10, 2013) revealed that although detected values for Be-7, which is a naturally occurring radionuclide, exceeded the range of past measurement values, all these radionuclides were considered to be within the past measurement trends since its maximum value in other environment monitoring is 0.18Bq/L¹³ (see Figure 2.1-1).

Table 2.1-1 Detection of radionuclides in the Monitoring of Levels [inland water]

Nuclides		Number of reported data	Detection times	Range of measured values (Bq/L)			The range of past measurement records (Bq/L) (*1)		
	Be-7	7	4	ND	-	0.034	ND	-	0.021
Naturally	K-40	10	10	0.016	-	0.18	0.0067	-	0.30
Occurring radionuclides	U-234	10	10	0.0015	-	0.0073	0.00042	-	0.015
	U-235	10	0	ND		ND	-	0.00054	
	U-238	10	10	0.00071	-	0.0055	ND	-	0.013
	Cs-134	9	1	ND	-	0.0035	ND	-	0.028
Artificial	Cs-137	9	4	ND	-	0.019	ND	-	0.055
radionuclides	I-131	7	0		ND		ND	-	0.013
	Sr-90	3	3	0.0013	_	0.0024	ND	-	0.0050

(*1) Results of the Monitoring of Levels from FY1996 to FY2015 (excluding data from March 11, 2011 to March 10, 2013)



Figure 2.1-1 Detection of radionuclides in the Monitoring of Levels [inland water]

¹² This report only covers data for river water, lake water, and freshwater in the Monitoring of Levels.

¹³ Environmental Radioactivity and Radiation in Japan "Environmental Radiation Database" http://search.kankyo-hoshano.go.jp/servlet/search.top. (Japanese only, accessed Feb 14, 2018)

(2) Seawater

In the Monitoring of Levels in FY2016, 6 radionuclides (Be-7, K-40, Cs-134, Cs-137, I-131 and Sr-90) were reported from seawater samples, as shown in Table 2.1-2.

A comparison with the results of the Monitoring of Levels for the last twenty years (excluding data from March 11, 2011, to March 10, 2013) revealed that detected values for K-40 and Cs-137 exceeded the range of the past measurement trends (see Figure 2.1-2). K-40 is a naturally occurring radionuclide and is derived from potassium in seawater. The detected value for Cs-137 is the same level as the detection limit collected at the same location in recent years.

Table 2.1-2 Detection	of radionuclides	in the Monitoring of	f Levels	[seawater]
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Nuclides		Number of reported data	Detection times	Range of measured values (Bq/L)			Range of past measurement records (Bq/L) (*1)		
Naturally occurring	Be-7	2	0	ND		ND NI		ND	
radionuclides	K-40	16	16	0.18	-	15	0.078	-	14
	Cs-134	16	0		ND			ND	
Artifical	Cs-137	16	2	ND	-	0.064	ND	-	0.0034
radionuclides	I-131	13	0		ND			ND	
	Sr-90	15	15	0.00064	-	0.0011	ND	-	0.0025

(*1) Results of the Monitoring of Levels from FY1996 to FY2015 (excluding data from March 11, 2011 to March 10, 2013)



Figure 2.1-2 Detection of radionuclides in the Monitoring of Levels [seawater]

2.2 Sediments

(1) Inland water sediments (river sediments)

In the Monitoring of Levels in FY2016, 3 radionuclides (U-234, U-235 and U-238) were reported from inland water sediment samples (river sediments) as shown in Table 2.2-1.

A comparison with the results of the Monitoring of Levels for the last twenty years (excluding data from March 11, 2011, to March 10, 2013) revealed that detected values for all 3 detected radionuclides were within the past measurement trends (see Figure 2.2-1).

Table 2.2-1	Detection of	of radionuclide	es in the	Monitoring	of Levels
	[Inland wate	er sediments	(river se	diments)]	

Nuclides		Number of reported data	Detection times	Range of measured values (Bq/L)			Range of past measurement records (Bq/L) (*1)		
Naturally	U-234	5	5	12	-	27	6.5	-	76
occurring radionuclides	U-235	5	5	0.47	-	1.1	0.20	-	3.4
	U-238	5	5	11	_	28	6.6	-	94

(*1) Results of the Monitoring of Environmental Radioactivity Levels from FY1996 to FY2015 (excluding data from March 11, 2011 to March 10, 2013 and results reported in mg/kg units)



Figure 2.2-1 Detection of radionuclides in the Monitoring of Levels [Inland water sediments (river sediments)]

(2) Sea sediments

In the Monitoring of Levels in FY2016, 6 radionuclides (Be-7, K-40, Cs-134, Cs-137, I-131, and Sr-90) were reported from seawater sediment samples as shown in Table 2.2-2.

A comparison with the results of the Monitoring of Levels for the last twenty years (excluding data from March 11, 2011, to March 10, 2013) revealed that detected values for all these radionuclides were within the past measurement trends (see Figure 2.2-2).

Nuclides		Number of reported data	Detection times	Range of measured values (Bq/L)			Range of past measurement records (Bq/L) (*1)		
Naturally occurring radionuclides	Be-7	4	0		ND		ND	-	13
	K-40	15	15	86	-	690	33	-	750
Artificial radionuclides	Cs-134	15	3	ND	-	1.9	ND	-	35
	Cs-137	15	9	ND	-	11	ND	-	76
	I-131	8	0		ND			ND	
	Sr-90	8	0		ND		ND	-	0.41

Table 2.2-2 Detection of radionuclides in the Monitoring of Levels [Sea sediments]

(*1) Results of the Monitoring of Environmental Radioactivity Levels from FY1996 to FY2015 (excluding data from March 11, 2011 to March 10, 2013)



Figure 2.2-2 Detection of radionuclides in the Monitoring of Levels [Sea sediments]