

Results of Radioactive Material Monitoring of Aquatic Organisms (Locations A and B along the Abukuma River)

<Locations A and B along the Abukuma River: Samples collected>

Items	General items		Radioactive materials			
	Water	Sediment	Water (Cs)	Water (Sr)	Sediment (Cs)	Sediment (Sr)
A-1	○	○	○	○	○	○
A-2	○	○	○	-	○	-
B-2	○	○	○	-	○	-
B-3	○	○	○	-	○	-

<Locations A and B along the Abukuma River: Site measurement item>

Items	Latitude and longitude of the location		Survey date and time			Water	Sediment				Other	
	Latitude	Longitude	Date	Time (water)	Time (sediment)		Water temperature (degrees C)	Sediment temperature (degrees C)	Property	Color	Contaminants	Water depth (m)
A-1(Surface layer)	37.6210°	140.5218°	2021/9/10	09:20	08:58	20.6	19.5	Silt	5Y3/2	Fallen leaves	6.00	37 (0.5m)*
A-1(Bottom layer)				09:30		20.7						
A-2	37.5673°	140.3946°		11:30	11:35	19.1	19.3	Sand	10YR4/4	None	0.75	>50
B-2	37.8121°	140.5058°		15:00	15:10	22.2	21.1	Sand	10YR4/4	None	0.70	40
B-3	37.8182°	140.4679°		13:50	14:00	20.5	20.8	Sand	10YR3/4	None	0.60	>50

* The number in parentheses indicates Secchi disk depth.

<Locations A and B along the Abukuma River: General survey items/Analysis of radioactive materials Water>

Items	Latitude and longitude of the location		Survey date and time		pH	BOD (mg/L)	COD (mg/L)	DO (mg/L)	Electric conductivity (mS/m)	Salinity	TOC (mg/L)	SS (mg/L)	Turbidity (FNU)	Cs-134 (Bq/L)	Cs-137 (Bq/L)	Sr-90 (Bq/L)	
	Latitude	Longitude	Date	Time (water)													
A-1(Surface layer)	37.6210°	140.5218°	2021/9/10	09:20	7.5	1.1	4.8	8.8	15.0	0.08	1.8	17	6.8	N.D.(0.0015)	0.012	0.00097	
A-1(Bottom layer)				09:30	7.5	1.2	4.3	9.0	15.2	0.08	1.8	14	6.6	0.0013	0.016	-	
A-2	37.5673°	140.3946°		11:30	7.5	<0.5	2.9	9.9	9.4	0.05	0.9	4	2.0	N.D.(0.0014)	0.010	-	
B-2	37.8121°	140.5058°		15:00	7.6	0.8	5.0	9.4	14.4	0.09	1.6	26	8.5	0.014	0.34	-	
B-3	37.8182°	140.4679°		13:50	7.9	<0.5	3.4	10.4	8.8	0.05	1.4	3	2.0	N.D.(0.0014)	0.0052	-	

Note) N.D. means to be below the detection limit and figures in parentheses show the detection limit.

<Locations A and B along the Abukuma River: General survey items/Analysis of radioactive materials Sediment>

Items	Latitude and longitude of the location		Survey date and time		pH	Redox potential E _{NHE} (mV)	Water content (%)	IL (%)	TOC (mg/g-dry)	Soil particle density (g/cm ³)	Grain size distribution							Cs-134 (Bq/kg-dry)	Cs-137 (Bq/kg-dry)	Sr-90 (Bq/kg-dry)	
	Latitude	Longitude	Date	Time (sediment)							Gravel (2-75mm) (%)	Coarse sand (0.85-2mm) (%)	Medium sand (0.25-0.85mm) (%)	Fine sand (0.075-0.25mm) (%)	Silt (0.005-0.075mm) (%)	Clay (Less than 0.005mm) (%)	Median grain diameter (mm)	Maximum grain diameter (mm)			
A-1	37.6210°	140.5218°	2021/9/10	08:58	7.3	67	40.3	8.2	25.3	2.586	0.0	0.3	2.3	40.3	42.3	14.8	0.058	2.0	15	400	0.41
A-2	37.5673°	140.3946°		11:35	7.0	129	22.0	2.7	6.3	2.731	14.7	23.5	31.7	11.7	10.2	8.2	0.56	9.5	14	380	-
B-2	37.8121°	140.5058°		15:10	7.4	549	15.5	1.7	2.2	2.694	0.0	0.4	57.5	30.5	7.9	3.7	0.28	2.0	3.7	110	-
B-3	37.8182°	140.4679°		14:00	7.5	489	20.4	1.4	1.8	2.630	13.5	16.6	43.8	16.7	4.9	4.5	0.48	9.5	3.8	86	-

Note) N.D. means to be below the detection limit and figures in parentheses show the detection limit.

<Locations A and B along the Abukuma River: Analysis items Aquatic organisms>

Locations	Sampling point	Latitude and longitude of the location		Sampling date	Division	Class	Order	Family	Scientific name	English name	Population	Sample weight (kg-wet)	Note			Radioactive cesium (Bq/kg-wet)			Sr-90 (Bq/kg-wet)
		Latitude	Longitude										Growth stage	Stomach contents	Measurement site	Total	Cs-134	Cs-137	
A-1	The main stream of the Abukuma River	37.6210°	140.5218°	2021/8/29	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	87	1.4	Immature fish,Mature fish	-	-	3.8	N.D.(1.5)	3.8	0.16
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale chub	374	2.1	Immature fish,Mature fish	-	-	3.7	N.D.(1.4)	3.7	0.24
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Gnathopogon elongatus elongatus</i>	<i>Gnathopogon elongatus elongatus</i>	46	0.24	Immature fish,Mature fish	-	-	1.5	N.D.(0.71)	1.5	-
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach	152	1.1	Immature fish	-	-	2.6	N.D.(1.3)	2.6	-
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropodus salmoides</i>	Largemouth bass	3	0.024	Immature fish	-	-	3.7	N.D.(1.9)	3.7	-
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropodus dolomieu</i>	Small mouth bass	4	0.20	Immature fish	-	-	3.0	N.D.(1.8)	3.0	-
					Vertebrata	Amphibia	Anura	Ranidae	<i>Rana japonica</i>	Japanese brown frog	4	0.087	Imago	-	-	61.3	2.3	59	-
					Vertebrata	Amphibia	Anura	Lithobates	<i>Lithobates catesbeianus</i>	American bullfrog	1	0.16	Imago	-	-	2.0	N.D.(1.1)	2.0	-
					Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.013	-	-	-	140	N.D.(8.6)	140	-
A-2	Harase River	37.5673°	140.3946°	2021/8/29	Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	Macromia amphigena	81	0.032	Larva(Dragonfly larva)	-	-	8.2	N.D.(2.7)	8.2	-
					Arthropoda	Insecta	Odonata	Cordulegastridae	<i>Anotogaster sieboldii</i>	<i>Anotogaster sieboldii</i>									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Melligomphus viridicostus</i>	<i>Melligomphus viridicostus</i>									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<i>Sieboldius albardae</i>									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Davidius sp.</i>	<i>Davidius</i>									
					Arthropoda	Insecta	Odonata	Aeshnidae	<i>Boyeria macclachlani</i>	<i>Boyeria macclachlani</i>									
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Protohermes grandis</i>	<i>Protohermes grandis</i>									
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish									
					Arthropoda	Malacostraca	Decapoda	Potamidae	<i>Geothelphusa dehaani</i>	Japanese freshwater crab	6	0.015	Juvenile,Imago	-	-	9.1	N.D.(3.5)	9.1	-
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Neocardina sp.</i>	<i>Neocardina</i>									
					Mollusca	Gastropoda	Architaenioglossa	Viviparidae	<i>Cipangopaludina chinensis laeta</i>	Mud-snail	2	0.0053	Juvenile	-	-	25	N.D.(7.1)	25	-
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	<i>Semisulcospira libertina</i>									
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur minnow	15	0.096	Immature fish,Mature fish	-	-	9.4	N.D.(2.3)	9.4	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale chub									
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudogobio esocinus esocinus</i>	<i>Pseudogobio esocinus esocinus</i>	7	0.061	Immature fish,Mature fish	-	-	7.9	N.D.(2.7)	7.9	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Candidia temminckii</i>	Dark chub									
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	31	0.093	Immature fish,Mature fish	-	-	5.5	N.D.(2.4)	5.5	-
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach									
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	Yamame trout	7	0.14	Immature fish	-	-	8.3	N.D.(2.1)	8.3	-
					Vertebrata	Cephalaspisomorphi	Petromyzontiformes	Petromyzontidae	<i>Lethenteron reissneri</i>	Far eastern brook lamprey									
					Vertebrata	Amphibia	Anura	-	-	Frog	59	0.042	Larva(Tadpole)	-	-	93.1	3.1	90	-
					Vertebrata	Amphibia	Anura	Ranidae	<i>Rana japonica</i>	Japanese brown frog									
					Vertebrata	Amphibia	Anura	Pelophylax	<i>Pelophylax porosus porosus</i>	Tokyo daruma pond frog	19	0.059	Imago	-	-	28	N.D.(3.3)	28	-
					Course Particulate Organic Matter	-	-	-	-	Bottom fallen leaves									
B-2	The main stream of the Abukuma River	37.8121°	140.5058°	2021/8/31	Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	5	4.0	Immature						