

OResults 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 Locations	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	
Locations	Latitude	Longitude	Date	Time (water)	Time (sediment)	Water temperature (degrees C)	Sediment temperature (degrees C)	Property	Color	Contaminants	Water depth (m)	Transparency (cm)
A-1(Surface layer)	37.6210°	140.5218°	2018/10/25	09:17	09:46	15.1	16.4	Silt	5Y3/2	None	7.30	>50 (2.5m)*
A-1(Bottom layer)				09:05		15.0						
A-2	37.5673°	140.3946°		11:37	11:54	15.4	15.8	Sand	2.5Y4/6	None	0.83	>50
B-2	37.8121°	140.5058°		15:05	15:15	17.1	17.3	Sand	2.5Y4/2	None	0.58	>50
B-3	37.8182°	140.4679°		13:56	14:05	16.6	17.2	Sand	2.5Y4/6	None	0.68	>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 Locations	Latitude and longitude of the location		Survey date and time		pH	BOD	COD	DO	Electric conductivity	Salinity	TOC	SS	Turbidity	Cs-134	Cs-137	Sr-90
	Latitude	Longitude	Date	Time (water)		(mg/L)	(mg/L)	(mg/L)	(mS/m)		(mg/L)	(mg/L)	(FNU)	(Bq/L)	(Bq/L)	(Bq/L)
A-1(Surface layer)	37.6210°	140.5218°	2018/10/25	09:17	7.3	1.4	3.3	9.7	19.0	0.10	1.5	3	2.0	N.D.(0.0013)	0.0074	0.0011
A-1(Bottom layer)				09:05	7.4	1.3	3.5	9.9	19.1	0.10	1.6	3	2.2	N.D.(0.0013)	0.011	-
A-2	37.5673°	140.3946°		11:37	7.7	<0.5	2.3	10.8	10.3	0.06	1.0	3	1.9	0.0015	0.011	-
B-2	37.8121°	140.5058°		15:05	7.9	0.8	2.8	12.1	17.8	0.10	1.3	4	2.1	N.D.(0.0012)	0.0089	-
B-3	37.8182°	140.4679°		13:56	8.0	<0.5	2.8	11.1	9.3	0.05	1.2	2	1.3	N.D.(0.0013)	0.0071	-

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 _h (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)	
											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)				
Locations	Latitude	Longitude	Date	Time (sediment)	2018/10/25																	
A-1	37.6210°	140.5218°		09:46		7.5	161	58.5	7.5	36.7	2.638	0.1	2.4	25.0	26.0	22.4	24.1	0.12	4.8	68	760	0.32
A-2	37.5673°	140.3946°		11:54		7.3	313	18.7	1.5	2.1	2.681	48.4	37.9	11.6	1.1	1.0		2.0	9.5	11	130	-
B-2	37.8121°	140.5058°		15:15		7.4	312	24.9	1.6	2.1	2.743	0.0	1.7	64.5	32.1	1.7		0.30	4.8	14	140	-
B-3	37.8182°	140.4679°		14:05	7.6	317	17.5	0.8	1.1	2.643	70.8	27.4	1.7	0.1	0.0		2.5	9.5	4.5	42	-	

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°	2018/10/19	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	Hemibarbus barbus	1	1.8	Mature fish	Obscure digesta	Viscera removed	11	N.D.(1.5)	11	0.54
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus salmoides</i>	Largemouth bass	1	0.014	Immature fish	Empty stomach	Viscera removed	7.0	N.D.(2.8)	7.0	-
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	1	1.1	Mature fish	Fish	Viscera removed	13	N.D.(1.8)	13	0.28
					Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.030	-	-	-	73.4	7.4	66	-
A-2	Harase River	37.5673°	140.3946°	2018/10/17	Arthropoda	Malacostraca	Decapoda	Potamidae	<i>Geothelphusa dehaani</i>	Japanese Freshwater Crab	30	0.049	Juvenile	-	-	6.8	N.D.(1.3)	6.8	-
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	Semisulcospira libertina	30	0.014	Imago	-	Molluscos part	7.9	N.D.(2.9)	7.9	-
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	Semisulcospira libertina	30	0.021	Imago	-	Molluscos part	4.7	N.D.(2.1)	4.7	-
					Vertebrata	Amphibia	Anura	-	-	Frog	20	0.012	Larva(Tadpole)	-	-	84.5	6.5	78	-
					Vertebrata	Amphibia	Anura	Glandirana	<i>Glandirana rugosa</i>	Wrinkled Frog	2	0.017	Imago	-	-	4.9	N.D.(2.3)	4.9	-
					Vertebrata	Amphibia	Anura	Pelophylax	<i>Pelophylax porosus porosus</i>	Tokyo Daruma pond frog			Imago	-	-	-	-	-	-
					Coarse Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.20	-	-	-	13	N.D.(1.9)	13	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	2	0.41	Mature fish	Obscure digesta	Viscera removed	11	N.D.(1.6)	11	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Carassius auratus</i>	Carassius auratus langsdorfii	1	0.74	Mature fish	Obscure digesta	Viscera removed	6.4	N.D.(1.4)	6.4	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Common carp	1	7.3	Mature fish	Obscure digesta	Viscera removed	8.1	N.D.(1.2)	8.1	0.43
B-2	The main stream of the Abukuma River	37.8121°	140.5058°	2018/10/19	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	Hemibarbus barbus	2	2.7	Mature fish	Obscure digesta	Viscera removed	18.1	2.1	16	0.49
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	3	2.6	Immature fish,Mature fish	Cut-tailed bullhead	Viscera removed	9.8	N.D.(1.7)	9.8	0.18
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	2	1.2	Immature fish	Empty stomach	Viscera removed	10	N.D.(1.2)	10	-
					Vertebrata	Osteichthyes	Siluriformes	Siluridae	<i>Silurus asotus</i>	Amur catfish	1	0.33	Mature fish	Japanese dace	Viscera removed	4.9	N.D.(1.9)	4.9	-
					Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.019	-	-	-	79.7	8.7	71	-
					Arthropoda	Insecta	Ephemeroptera	Ephemeridae	<i>Ephemera strigata</i>	Mont mayfly	432	0.020	Larva	-	-	23	N.D.(1.9)	23	-
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	4	0.037	Juvenile,Imago	-	-	7.6	N.D.(1.8)	7.6	-
B-3	Surikami River	37.8182°	140.4679°	2018/10/20	Vertebrata	Osteichthyes	Anguilliformes	Anguillidae	<i>Anguilla japonica</i>	Japanese eel	1	0.22	Mature fish	Empty stomach	Viscera removed	5.99	0.69	5.3	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	50	0.33	Immature fish	-	-	4.1	N.D.(0.32)	4.1	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale chub	2	0.029	Immature fish,Mature fish	-	-	6.8	N.D.(1.9)	6.8	-
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou masou</i>	Seema	2	1.2	Mature fish	Empty stomach	Viscera removed	0.46	N.D.(0.37)	0.46	-
					Coarse Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.21	-	-	-	2.4	N.D.(1.9)	2.4	-
					Arthropoda	Insecta	Ephemeroptera	Ephemeridae	<i>Ephemera strigata</i>	Mont mayfly	432	0.020	Larva	-	-	23	N.D.(1.9)	23	-
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	4	0.037	Juvenile,Imago	-	-	7.6	N.D.(1.8)	7.6	-

*1: Organisms were collected in or around the targeted water areas.

*2: When multiple types of aquatic organisms were collected, a sample was prepared by mixing them.

*3: For a sample made of multiple types of aquatic organisms, the English name of the dominant one largest in number is underlined.

*4: Basically, measurement was conducted for all organism samples. Viscera (stomach and bowels) were removed for the measurement when possible so that undigested food and sediments, etc. in the digestive system would be excluded.

*5: Plankton (suspended algae) is the residue remaining after the filtration of lake water or seawater with a plankton net (40µm-mesh).

*6: River bottom materials (incl. algae) are algae, etc. that were scratched off stones with a brush, etc. and may include very fine particles such as inorganic silt and clay.

*7: N.D. means to be below the detection limit and figures in parentheses show the detection limit.

*8: Activity concentrations include counting errors, but the details are omitted here.