

Table S1Analytical results of ^{137}Cs activity concentration in surface water collected at feeder river of Matsukawau-ra lagoon. ^{137}Cs activity concentrations were decay-corrected to the sampling date.

Station	Sampling date	Long E	Lat N	Salinity	^{137}Cs in suspended particles (Bq kg^{-1})	Particulate ^{137}Cs (Bq m^{-3})	Dissolved ^{137}Cs (Bq m^{-3})
KZ	2021/6/17	140.9272	37.8076	0.1	1128 ± 87	4.5 ± 0.3	3.5 ± 0.2
	2021/7/20			0.2	3677 ± 221	6.0 ± 0.4	2.7 ± 0.3
	2021/8/27			0.1	4835 ± 854	1.8 ± 0.3	3.7 ± 0.3
	2021/9/24			0.1	1419 ± 68	6.5 ± 0.3	2.2 ± 0.3
	2021/10/28			0.1	2368 ± 196	3.6 ± 0.3	1.2 ± 0.3
	2021/12/24			0.4	1833 ± 115	4.8 ± 0.3	2.6 ± 0.3
	2022/2/8			1.0	191 ± 34	0.5 ± 0.1	2.7 ± 0.3
	2022/6/23			0.1	386 ± 65	1.4 ± 0.2	1.0 ± 0.3
	2022/8/30			0.1	955 ± 19	47.0 ± 0.9	1.8 ± 0.3
	2022/10/27			0.1	776 ± 144	1.1 ± 0.2	1.2 ± 0.3
	2023/2/20			0.1	653 ± 119	1.7 ± 0.3	2.1 ± 0.3
UD	2021/6/17	140.9126	37.7902	0.1	1110 ± 163	1.9 ± 0.3	2.0 ± 0.3
	2021/7/20			0.1	1790 ± 447	1.1 ± 0.3	2.3 ± 0.2
	2021/8/27			0.1	2368 ± 272	2.4 ± 0.3	2.5 ± 0.3
	2021/9/24			0.1	988 ± 149	2.0 ± 0.3	1.8 ± 0.2
	2021/10/28			0.1	1435 ± 91	5.1 ± 0.3	1.3 ± 0.3
	2021/12/24			0.1	4452 ± 352	3.1 ± 0.2	1.8 ± 0.3
	2022/2/8			0.1	3750 ± 327	2.9 ± 0.3	1.0 ± 0.2
	2022/6/23			0.1	376 ± 122	0.4 ± 0.1	2.2 ± 0.3
	2022/8/30			0.1	670 ± 15	45.7 ± 1.0	1.0 ± 0.2
	2022/10/27			0.1	1308 ± 211	0.7 ± 0.1	1.3 ± 0.3
	2023/2/20			0.1	2331 ± 541	1.2 ± 0.3	1.3 ± 0.3
UM	2021/6/17	140.9494	37.7863	0.1	1496 ± 30	45.6 ± 0.9	3.4 ± 0.2
	2021/7/20			0.1	2331 ± 51	37.6 ± 0.8	2.3 ± 0.2
	2021/8/27			0.1	9140 ± 384	13.7 ± 0.6	3.0 ± 0.3
	2021/9/24			0.1	974 ± 29	15.8 ± 0.5	3.4 ± 0.4
	2021/10/28			0.1	1034 ± 28	15.8 ± 0.4	2.3 ± 0.3
	2021/12/24			0.1	1244 ± 53	8.7 ± 0.4	3.3 ± 0.3
	2022/2/8			0.1	789 ± 36	7.3 ± 0.3	3.0 ± 0.3
	2022/6/23			0.1	1346 ± 24	33.2 ± 0.6	2.4 ± 0.3
	2022/8/30			0.1	2707 ± 49	54.1 ± 1.0	1.7 ± 0.3
	2022/10/27			0.1	1014 ± 60	5.6 ± 0.3	2.6 ± 0.3
	2023/2/20			0.2	454 ± 28	5.5 ± 0.3	1.6 ± 0.3
NK	2021/6/17	140.9428	37.7594	0.1	1360 ± 65	10.0 ± 0.5	3.9 ± 0.2
	2021/7/20			0.1	560 ± 88	1.5 ± 0.2	3.3 ± 0.2
	2021/8/27			0.1	1861 ± 210	3.3 ± 0.4	3.8 ± 0.3
	2021/9/24			0.1	2176 ± 74	15.3 ± 0.5	3.2 ± 0.3
	2021/10/28			0.1	2224 ± 80	12.0 ± 0.4	3.2 ± 0.3
	2021/12/24			0.1	373 ± 51	2.1 ± 0.3	3.9 ± 0.4
	2022/2/8			0.1	360 ± 65	1.5 ± 0.3	3.5 ± 0.3
	2022/6/23			0.1	1208 ± 146	2.3 ± 0.3	2.4 ± 0.3
	2022/8/30			0.1	1702 ± 32	55.8 ± 1.0	4.0 ± 0.4
	2022/10/27			0.1	1039 ± 75	3.7 ± 0.3	4.0 ± 0.4
	2023/2/20			0.1	595 ± 31	6.0 ± 0.3	3.5 ± 0.3

Table S2Analytical results of ^{137}Cs activity concentration in surface water collected at Matsukawa-ura lagoon. ^{137}Cs activity concentrations were decay-corrected to the sampling date.

Station	Sampling date	Long E	Lat N	Salinity	^{137}Cs in suspended particles (Bq kg^{-1})	Particulate ^{137}Cs (Bq m^{-3})	Dissolved ^{137}Cs (Bq m^{-3})
UME	2021/6/17	140.9698	37.7869	6.0	730 ± 14	103.3 ± 2.0	23.5 ± 0.4
	2021/7/20			26.8	489 ± 16	18.0 ± 0.6	31.3 ± 0.7
	2021/8/27			28.3	16433 ± 770	12.3 ± 0.6	18.0 ± 0.5
	2021/9/24			28.7	594 ± 7	123.3 ± 1.4	24.6 ± 0.8
	2021/10/28			26.7	853 ± 26	13.2 ± 0.4	14.4 ± 0.6
	2021/12/24			23.3	2005 ± 108	5.6 ± 0.3	7.2 ± 0.5
	2022/2/8			31.0	779 ± 34	7.2 ± 0.3	9.0 ± 0.4
	2022/6/23			28.4	1001 ± 34	12.7 ± 0.4	25.1 ± 0.8
	2022/8/30			15.6	1369 ± 19	121.9 ± 1.7	14.4 ± 0.6
	2022/10/27			32.0	1509 ± 30	28.2 ± 0.6	17.7 ± 0.6
	2023/2/20			32.5	570 ± 31	7.3 ± 0.4	8.3 ± 0.5
OSS	2021/6/17	140.9792	37.7967	30.9	751 ± 26	13.6 ± 0.5	21.0 ± 0.4
	2021/7/20			28.8	1708 ± 85	7.6 ± 0.4	24.0 ± 0.6
	2021/8/27			26.1	1482 ± 141	2.8 ± 0.3	12.5 ± 0.4
	2021/9/24			28.7	1162 ± 35	16.4 ± 0.5	14.0 ± 0.6
	2021/10/28			26.8	1224 ± 147	2.2 ± 0.3	8.9 ± 0.5
	2021/12/24			29.7	447 ± 105	0.9 ± 0.2	5.2 ± 0.4
	2022/2/8			31.7	232 ± 36	1.4 ± 0.2	6.4 ± 0.4
	2022/6/23			30.1	869 ± 68	4.0 ± 0.3	17.2 ± 0.6
	2022/8/30			9.7	503 ± 21	15.8 ± 0.7	9.7 ± 0.5
	2022/10/27			32.6	632 ± 68	2.5 ± 0.3	10.0 ± 0.5
	2023/2/22			33.4	888 ± 176	1.2 ± 0.2	5.9 ± 0.4
IWS	2021/6/17	140.9745	37.8048	31.1	1985 ± 64	15.6 ± 0.5	14.8 ± 8.9
	2021/7/20			29.0	898 ± 58	4.9 ± 0.3	22.6 ± 0.7
	2021/8/27			26.7	1780 ± 200	2.2 ± 0.3	12.9 ± 0.5
	2021/9/24			29.4	641 ± 42	4.4 ± 0.3	10.5 ± 0.5
	2021/10/28			27.8	788 ± 92	2.2 ± 0.3	7.4 ± 0.5
	2021/12/24			30.0	399 ± 84	1.0 ± 0.2	5.4 ± 0.4
	2022/2/8			32.0	436 ± 143	0.5 ± 0.2	3.3 ± 0.4
	2022/6/23			28.3	398 ± 29	4.1 ± 0.3	14.1 ± 0.5
	2022/8/30			27.7	340 ± 40	2.1 ± 0.3	11.2 ± 0.5
	2022/10/27			33.9	286 ± 45	1.2 ± 0.2	10.1 ± 0.5
	2023/2/22			33.8	177 ± 43	0.4 ± 0.1	4.3 ± 0.3
UDE	2021/6/17	140.9742	37.8133	32.6	751 ± 34	8.7 ± 0.4	9.5 ± 0.4
	2021/7/20			30.7	440 ± 28	5.0 ± 0.3	9.4 ± 0.2
	2021/8/27			28.9	9719 ± 885	3.2 ± 0.3	10.0 ± 0.3
	2021/9/24			10.4	751 ± 76	2.4 ± 0.2	4.4 ± 0.4
	2021/10/28			15.7	879 ± 77	2.5 ± 0.2	3.8 ± 0.4
	2021/12/24			23.7	648 ± 114	1.2 ± 0.2	3.5 ± 0.4
	2022/2/8			27.2	307 ± 83	0.5 ± 0.1	2.5 ± 0.3
	2022/6/23			31.9	595 ± 61	2.1 ± 0.2	6.9 ± 0.4
	2022/8/30			19.5	460 ± 20	7.0 ± 0.3	8.4 ± 0.4
	2022/10/27			34.6	471 ± 37	3.6 ± 0.3	7.3 ± 0.4
	2023/2/22			27.2	631 ± 106	1.3 ± 0.2	4.4 ± 0.3

Station	Sampling date	Long E	Lat N	Salinity	¹³⁷ Cs in suspended particles (Bq kg ⁻¹)	Particulate ¹³⁷ Cs (Bq m ⁻³)	Dissolved ¹³⁷ Cs (Bq m ⁻³)
KZE	2021/6/17	140.9617	37.8208	32.3	644 ± 32	6.8 ± 0.3	20.3 ± 0.4
	2021/7/20			30.4	361 ± 34	2.9 ± 0.3	11.5 ± 0.5
	2021/8/27			30.4	2240 ± 171	4.3 ± 0.3	12.3 ± 0.3
	2021/9/24			29.6	466 ± 14	14.5 ± 0.4	11.8 ± 0.5
	2021/10/28			30.7	704 ± 70	2.5 ± 0.2	6.8 ± 0.5
	2021/12/24			30.0	193 ± 63	0.4 ± 0.1	4.7 ± 0.3
	2022/2/8			32.3	555 ± 153	0.8 ± 0.2	4.7 ± 0.3
	2022/6/23			27.8	905 ± 42	7.5 ± 0.3	15.5 ± 0.6
	2022/8/30			29.7	483 ± 25	6.5 ± 0.3	12.0 ± 0.5
	2022/10/27			34.1	375 ± 72	1.4 ± 0.3	7.7 ± 0.5
WKS	2023/2/22	140.9807	37.8199	33.9	401 ± 76	1.1 ± 0.2	5.0 ± 0.4
	2021/6/17			29.0	160 ± 14	4.1 ± 0.3	13.4 ± 0.6
	2021/7/20			31.5	171 ± 49	1.0 ± 0.3	7.5 ± 0.2
	2021/8/27			29.2	1790 ± 254	2.0 ± 0.3	13.6 ± 0.4
	2021/9/24			29.6	583 ± 54	3.4 ± 0.3	10.9 ± 0.5
	2021/10/28			31.4	1086 ± 106	3.3 ± 0.3	6.2 ± 0.5
	2021/12/24			29.6	557 ± 165	0.7 ± 0.2	5.6 ± 0.4
	2022/2/8			32.3	347 ± 107	0.5 ± 0.1	4.9 ± 0.3
	2022/6/23			31.8	404 ± 58	0.8 ± 0.1	8.4 ± 0.5
	2022/8/30			26.1	407 ± 65	1.5 ± 0.2	11.1 ± 0.5
WKO	2022/10/27	140.9756	37.8219	34.2	9604 ± 261	15.4 ± 0.4	7.9 ± 0.5
	2023/2/20			34.6	204 ± 29	0.2 ± 0.0	3.5 ± 0.4
	2021/6/17			31.4	699 ± 71	2.3 ± 0.2	7.2 ± 0.2
	2021/7/20			31.3	287 ± 20	4.0 ± 0.3	6.5 ± 0.2
	2021/8/27			30.0	553 ± 77	1.8 ± 0.2	8.0 ± 0.3
	2021/9/24			29.6	1097 ± 102	2.3 ± 0.2	10.4 ± 0.5
	2021/10/28			30.9	1202 ± 192	1.6 ± 0.2	6.8 ± 0.5
	2021/12/24			30.2	1007 ± 218	1.1 ± 0.2	5.1 ± 0.4
	2022/2/8			32.9	100 ± 29	0.1 ± 0.0	2.9 ± 0.3
	2022/6/23			32.0	590 ± 106	1.3 ± 0.2	5.6 ± 0.4
SKS	2022/8/30	140.9774	37.8277	29.8	871 ± 157	1.2 ± 0.2	7.6 ± 0.5
	2022/10/27			33.3	1044 ± 81	3.8 ± 0.3	7.1 ± 0.4
	2023/2/22			34.4	765 ± 220	0.4 ± 0.1	4.1 ± 0.4
	2021/6/17			31.4	190 ± 42	0.9 ± 0.2	7.6 ± 0.6
	2021/7/20			29.6	199 ± 35	0.9 ± 0.2	14.2 ± 0.3
	2021/8/27			30.0	2024 ± 263	1.7 ± 0.2	7.9 ± 0.4
	2021/9/24			29.0	208 ± 44	0.4 ± 0.1	7.1 ± 0.4
	2021/10/28			28.7	631 ± 160	0.9 ± 0.2	7.2 ± 0.5
	2021/12/24			29.4	387 ± 98	0.6 ± 0.2	6.8 ± 0.5
	2022/2/8			32.3	522 ± 127	0.9 ± 0.2	4.0 ± 0.4
URS	2022/6/23	141.0039	37.8000	30.1	749 ± 102	1.8 ± 0.2	9.4 ± 0.5
	2022/8/30			29.3	148 ± 37	0.2 ± 0.1	6.2 ± 0.4
	2022/10/27			34.1	551 ± 62	2.3 ± 0.3	9.0 ± 0.4
	2023/2/22			33.7	1256 ± 329	0.9 ± 0.2	4.4 ± 0.4
	2021/8/2			32.0	-	-	3.1 ± 0.2
	2021/10/14			30.5	167 ± 53	0.2 ± 0.1	4.8 ± 0.4
	2022/2/1			34.4	403 ± 76	0.4 ± 0.1	3.1 ± 0.4
	2022/6/1			33.7	122 ± 28	0.4 ± 0.1	2.8 ± 0.3
	2022/8/3			32.7	-	-	2.7 ± 0.3
	2022/10/3			33.4	247 ± 61	0.8 ± 0.2	2.5 ± 0.3
	2023/2/7			34.3	175 ± 48	0.2 ± 0.1	2.2 ± 0.3

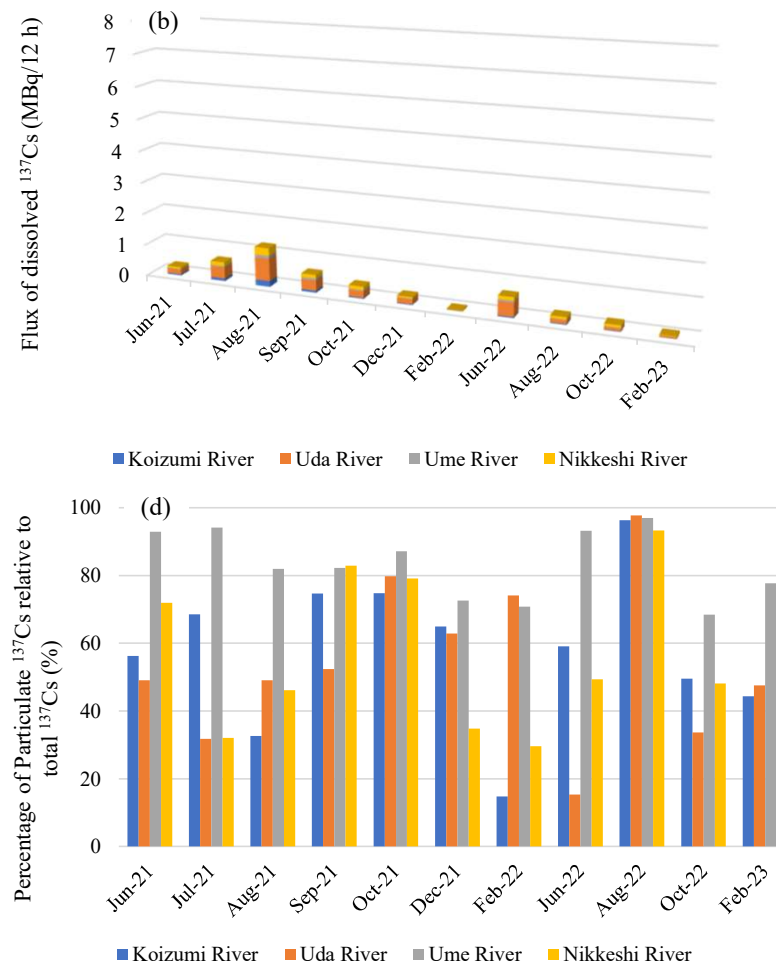
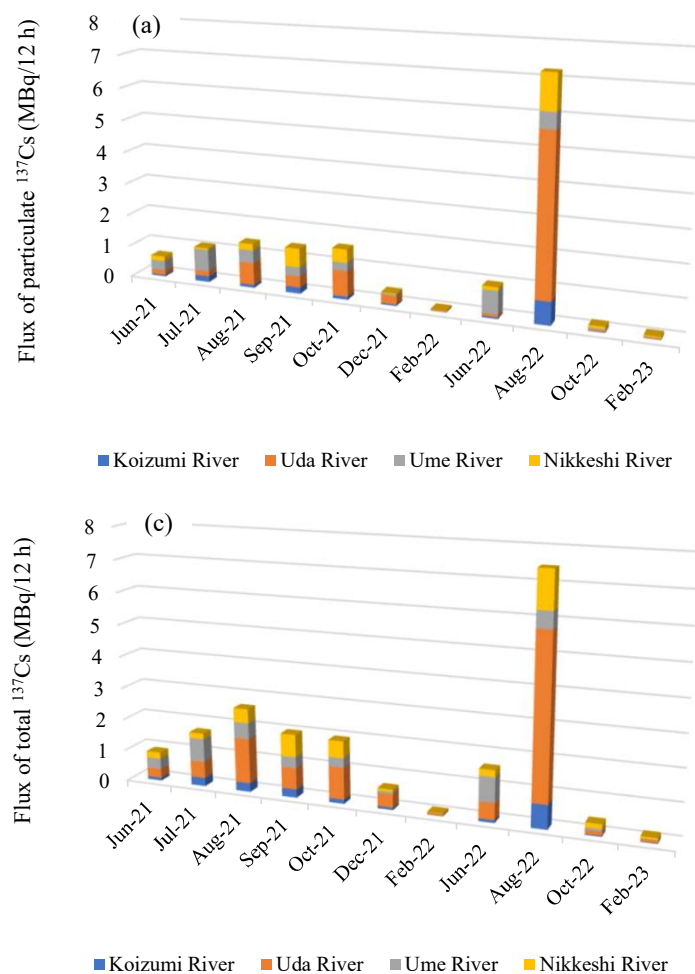


Figure S1: Fluxes of ^{137}Cs from rivers flowing into Matsukawa-ura lagoon and the percentage of particulate ^{137}Cs flux relative to total ^{137}Cs flux. (a) Fluxes of particulate ^{137}Cs from rivers, (b) fluxes of dissolved ^{137}Cs , (c) fluxes of total ^{137}Cs , and (d) percentages of particulate ^{137}Cs relative to the total fluxes.