NIRS-RSD-54

RADIOACTIVITY SURVEY DATA in Japan

NUMBER 54

Sep. 1980

National Institute of Radiological Sciences

Chiba, Japan

Radioactivity Survey Data in Japan

Number 54

September 1980

CONTENTS

Environmental and Dietary Materials*

(Japan Chemical Analysis Center)

1. Collection and pretreatment of samples

(1) Rain and dry fallout

Rain and dry fallout was collected monthly on a sampling tray, approximately 5000 cm^2 in area, which was filled with water to a depth of 1 cm at the beginning of every month.

The sample was filtered after strontium and cesium carriers were added. The tray was washed with 5ℓ of distilled water and the washing was combined to the filtrate. The sample was passed through a cation exchange column (500 mℓ of Dowex 50W X8, 50 ~ 100 mesh, Na form) at a rate of 80 mℓ/min.

(2) Airborne dust

Airborne dust was collected by an electrostatic precipitator or a filter air sampler for every three months at a rate of more than 3000 m^3 per month. The sampling was done 1 to 1.5 meters above the ground.

(3) Service water and freshwater

Service water, 100ℓ each, was collected at an intake of the water-treatment plant and at the tap after water was left running for five minutes. Water, to which added carriers of strontium and cesium immediately after sampling, was vigorously stirred and filtered. The subsequent process was the same as that described in the section (1). Freshwater was treated in the same way as the service water.

(4) Soil

Soil was collected from the location in the spacious and flat area without past disturbance on the surface caused by duststorms, inflow and outflow due to precipitation, and so on. Any places located under trees in a forest, in a stony area or inside of river banks were avoided. Soil was taken from two layers of different depths, 0 ~ 5 cm and 5 ~ 20 cm. In the course of air-drying, lumps were crushed by hand, and roots of plants and pebbles were removed. The soil was then passed through a 2 mm sieve to remove small gravels.

(5) Sea water

Sea water was collected at the fixed stations where the effect of terrestrial fresh water from rivers was expected to be negligibly small. A special consideration was also given to weather conditions. The sampling was carried out when there was no rainfall for the last few days. To prevent contamination, water samples were collected at the bow of a sampling boat just before she stood still by scooping surface water using a polyethylene bucket. Immediately after the collection, the samples were acidified to a pH lower than 3 by adding concentrated hydrochloric acid in a ratio of 1 mℓ to 1 ℓ of sea water, and then stored in 20 ℓ polyethylene containers. The sampling equipments as well as containers were thoroughly rinsed with dilute hydrochloric acid and then with distilled water before use. Two hundred milliliters of sea water was also collected at the same stations for the determination of chlorinity.

(6) Sea sediments

Sediment was collected in the same area as that for the sea water sample, taking the following criteria into account:

a. The depth of water exceeds 1 m at low tide.
b. No significant sedimental movement is observed in the vicinity of concern.
c. Mud, silt and fine sand are preferable.

A conventional sediment sampling device was used for collecting the top few centimeters of surface sediment. Approximately 4 kg of the sample in wet weight was spread on a large porcelain dish and dried in an electric oven at 105 to 110 °C to a constant weight.

(7) Total diet

A full one day ordinary diet including three meals, water, tea and other in-between snacks for five persons was collected as a sample of "total diet". The sample in a large stainless steel pan was carbonized carefully by direct application of gas flame, and was transferred to a porcelain dish and then ashed at 500°C in an electric muffle furnace.

(8) Rice

Polished rice was collected in producing districts at the harvest and in consuming areas when new crops were first put on sale. The sample was carbonized and ashed in a porcelain dish.

* Samples were sent to the Center from 32 contracted prefectures.

(9) Milk

Raw milk was collected in producing districts and commercial milk was purchased in consuming districts. Milk in a stainless steel pan or a porcelain dish was evaporated to dryness followed by carbonization and ashing.

(10) Vegetables

Spinach and Japanese radish were selected as the representatives for leaf vegetables and for non-starch roots, respectively. After removing soil, the edible part of vegetable sample was dried and carbonized in a stainless steel pan or a porcelain dish.

(11) Tea

Five hundred grams of manufactured green tea was collected, carbonized and ashed in a stainless steel pan or a porcelain dish.

(12) Fish, shellfish and seaweeds

a. Sea fish and freshwater fish

Fish was rinsed with water and blotted with a filter paper. Only the edible part was used in case of larger sized fish, and the whole part was used in case of smaller ones. Each sample was weighed and placed in a stainless steel pan or a porcelain dish. After carbonized, the sample was ashed in an electric muffle furnace.

b. Shellfish

Approximately 4 kg of shellfish including the shells was collected or purchased. After removing the shells, it was treated in the same way as that for the sea fish.

c. Seaweeds

Edible seaweeds were collected and rinsed with water to remove sand and other adhering matters on the surface. These were removed of excess water, weighed, dried and ashed.

Table 1 shows detailes of sample collection.

Table 1 Details of sample collection

Sample	Frequency of sampling	Quantity of sample
= Environmental materials =		
(1) Rain and dry fallout		
1 for domestic program	monthly	
2 for WHO program	monthly	
(2) Airborne dust	quarterly	>3000 m^3/month
(3) Service water and freshwater		
1 Service water (sourse water)	semiyearly (June and December)	100 ℓ
2 Service water (tap water)	semiyearly (June and December)	100 ℓ
3 Freshwater	yearly (fishing season)	100 ℓ
(4) Soil		
1 0 ~ 5 cm	yearly (June or July)	4 kg
2 5 ~ 20 cm	yearly (June or July)	4 kg
(5) Sea water	yearly (July or August)	40 ℓ
(6) Sea sediments	yearly (July or August)	4 kg
= Dietary materials =		
(7) Total diet	semiyearly (June, November or December)	daily amount for 5 person
(8) Rice		
1 producing districts	yearly (harvesting season)	5 kg (polished rice)
2 consuming districts	yearly (harvesting season)	5 kg (polished rice)
(9) Milk		
1 producing districts for WHO program	quarterly (February, May, August and November)	3 ℓ
2 producing districts for domestic program	semiyearly (February and August)	3 ℓ

Sample	Frequency of sampling	Quantity of sample
3 consuming districts	semiyearly (February and August)	3 ℓ
4 powdered milk	semiyearly (April and October)	2 ~ 3 kg
(10) Vegetables		
1 producing districts	yearly (harvesting season)	4 kg
2 consuming districts	yearly (harvesting season)	4 kg
(11) Tea	yearly (the first harvesting season)	500 g (manufactured tea)
(12) Fish, shellfish, and seaweeds		
1 Sea fish	yearly (fishing season)	4 kg
2 Freshwater fish	yearly (fishing season)	4 kg
3 Shellfish	yearly (fishing season)	4 kg
4 Seaweeds	yearly (fishing season)	2 ~ 3 kg

2. Preparation of samples for analysis

(1) Rain, service water and freshwater

Strontium and cesium were eluted with hydrochloric acid from the cation exchange column. The residue of rain sample on the filter paper was ashed in an electric muffle furnace and the ash was dissolved in hydrochloric acid. The insoluble part was filtered and washed. The filtrate and the washings were combined to the previous eluate and used for radiochemical analysis.

(2) Soil

Air-dried soil was passed through a 20 mesh sieve. The sieved sample was heated, in the presence of strontium and cesium carriers, together with sodium hydroxide. The sample was then heated with hydrochloric acid and the insoluble part was filtered and washed. The combined solution of the filtrate and washings was used for radiochemical analysis.

(3) Sea sediments

After removal of pebbles, shells and other foreign matters, the sediment sample was dried in a hot-air oven and ground finely with a mortar. The sample was passed through a 20 mesh sieve. The further preparation of the sample was the same as that described in the section 2-(2).

(4) Rice

The ashed sample was pulverlized with a porcelain mortar and passed through a 42 mesh sieve. The sieved sample to which both strontium and cesium carriers were added, was digested with hydrochloric acid by heating. After the sample was heated again with nitric acid to dryness, strontium and cesium were extracted with hydrochloric acid and water. The insoluble part was filtered and washed. The filtrate and washings were combined for subsequent radiochemical analysis.

(5) Airborne dust, diet, milk, vegetable, fish and shellfish, seaweeds, tea, and others

These ashed samples were treated with the same procedure as that described in the section 2-(4).

3. Separation of strontium-90 and cesium-137

(1) Strontium-90

Sample solutions, prepared as in the foregoing sections 2-(1) through 2-(5), were neutralized with sodium hydroxide. After sodium carbonate was added, the precipitate of strontium and calcium carbonates was separated. The supernatant solution was retained for cesium-137 determination. The carbonates were dissolved in hydrochloric acid and calcium and strontium were precipitated as oxalates. The precipitate was dissolved in nitric acid and strontium was separated from calcium by successive fuming nitric acid separations. Iron scavenge was made after addition of ferric iron carrier followed by barium chromate separation after addition of barium carrier to remove radium, its daughters and lead. Strontium was recovered as carbonate, and the precipitate was dried and weighed to determine strontium recovery. The strontium carbonate was dissolved in hydrochloric acid and the iron carrier was added. The solution was allowed to stand

for two weeks for strontium-90 and yttrium-90 to attain equilibrium. The yttrium-90 was coprecipitated with ferric hydroxide and the precipitate was filtered off, washed and counted.

(2) Cesium-137

The supernatant separated from the strontium fraction in the solution was acidified with hydrochloric acid. While stirring the solution, cesium was adsorbed on ammonium molybdophosphate.

After filtered off and washed with dilute nitric acid, the precipitate was dissolved in 2.5N sodium hydroxide solution. Ammonia was removed completely from the solution by boiling. The solution was adjusted to pH 8.2 with hydrochloric acid and allowed to cool. Molybdenum hydroxide which came out in the solution, was filtered off and washed with water. In such circumstance that ontamination by rubidium-87 was not negligible for the measurement of cesium-137, the following ion-exchange procedure was applied. A fixed amount of ferric chloride solution was added to the solution dissolved with 2.5N sodium hydroxide. Ammonia and molybdenum hydroxide were removed as described above. Ethylenediaminetetraaceticacid tetrasodium salt was added to the filtrate and washings. Cesium and rubidium were adsorbed on a cation exchange resin. Cesium was separated from rubidium by eluting with hydrochloric acid.

To this eluate or the filtrate and washings after removing molybdenum hydroxide, chloroplatinic acid solution was added to precipitate cesium. The precipitate was filtered onto a tared paper in a demountable filter and washed with water and then ethanol. After fixing the filter paper on a tared planchette and drying it, the chemical yield of cesium was determined by weighing the precipitate with the planchette. Radioactivity from cesium-137 was measured for this precipitate.

4. Determination of stable strontium, calcium and potassium

A weighed amount of soil or sea sediment was treated under heating with sodium hydroxide and then with hydrochloric acid for extraction. A weighed aliquot of ashed samples of total diet, vegetables, milk, fish, shellfish or seeweeds was digested using hydrochloric acid or nitric acid, hydrofluoric acid being used when necessary. The extract was made up to an appropriate volume with dilute hydrochloric acid. The sample solution was analyzed for calcium by titration with standard potassium permanganate solution after separating calcium as oxalate. Atomic absorption spectroscopy was applied when appropriate. Stable strontium and potassium were determined by atomic absorption and flame emission spectrometry, respectively.

5. Counting

After the radiochemical separation, the mounted precipitates were counted for activity using low background beta counters normally for 60 min. Net sample counting rates were corrected for counter efficiency, recovery, self-absorption and decay to obtain the content of strontium-90 and cesium-137 radio activity per sample aliquot. From the results, concentrations of these nuclides in the original samples were calculated.

6. Results

(1)-1 Strontium-90 and Cesium-137 in Rain and dry fallout (for domestic program)

(from June 1980 to Dec. 1980)

– continued from No. 53 of this publication –

Table 1 -1: Strontium-90 and Cesium-137 in Rain and dry fallout

Location	Duration (Days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
June, 1980				
Matsue, SHIMANE	31	114.5	0.009 ± 0.0009	0.014 ± 0.0010
Hiroshima, HIROSHIMA	30	260.3	0.014 ± 0.0010	0.021 ± 0.0012
July, 1980				
Sapporo, HOKKAIDO	32	86.0	0.009 ± 0.0008	0.016 ± 0.0010
Aomori, AOMORI	32	82.9	0.019 ± 0.0012	0.022 ± 0.0013
Sendai, MIYAGI	32	419.6	0.029 ± 0.0019	0.058 ± 0.0019
Futaba-gun, FUKUSHIMA	32	228	0.020 ± 0.0012	0.033 ± 0.0014
Mito, IBARAGI	32	227.0	0.017 ± 0.0011	0.023 ± 0.0014
Shinjuku, TOKYO	32	217	0.015 ± 0.0012	0.027 ± 0.0013
Yokohama, KANAGAWA	32	190.7	0.013 ± 0.0010	0.019 ± 0.0011
Fukui, FUKUI	32	319.8	0.017 ± 0.0011	0.024 ± 0.0012
Shizuoka, SHIZUOKA	32	470.5	0.014 ± 0.0011	0.024 ± 0.0012
Nagoya, AICHI	32	354	0.018 ± 0.0012	0.031 ± 0.0014
Kyoto, KYOTO	32	329.8	0.018 ± 0.0011	0.025 ± 0.0014
Wakayama, WAKAYAMA	34	112	0.007 ± 0.0008	0.013 ± 0.0010
Tottori, TOTTORI	32	316.42	0.018 ± 0.0011	0.019 ± 0.0012
Matsue, SHIMANE	32	386.1	0.010 ± 0.0009	0.029 ± 0.0014
Hiroshima, HIROSHIMA	31	295.5	0.010 ± 0.0010	0.013 ± 0.0010
Matsuyama, EHIME	33	389.5	0.010 ± 0.0010	0.016 ± 0.0011
Tsukushi-gun, FUKUOKA	32	753.5	0.016 ± 0.0011	0.023 ± 0.0013
Saga, SAGA	33	799.3	0.007 ± 0.0009	0.010 ± 0.0009
Nagasaki, NAGASAKI	32	864.0	0.012 ± 0.0010	0.019 ± 0.0011
Nakagami-gun, OKINAWA	32	101.5	0.001 ± 0.0006	0.002 ± 0.0006
August, 1980				
Sapporo, HOKKAIDO	32	126.5	0.008 ± 0.0008	0.013 ± 0.0010
Aomori, AOMORI	32	114.5	0.009 ± 0.0009	0.015 ± 0.0011
Sendai, MIYAGI	32	291.1	0.011 ± 0.0009	0.019 ± 0.0012
Futaba-gun, FUKUSHIMA	32	180	0.007 ± 0.0008	0.013 ± 0.0010
Mito, IBARAGI	32	102.0	0.003 ± 0.0008	0.004 ± 0.0008
Shinjuku, TOKYO	32	157.8	0.005 ± 0.0006	0.008 ± 0.0009
Yokohama, KANAGAWA	33	193.9	0.005 ± 0.0009	0.006 ± 0.0008
Fukui, FUKUI	33	205.3	0.001 ± 0.0008	0.005 ± 0.0008
Shizuoka, SHIZUOKA	32	212	0.003 ± 0.0006	0.006 ± 0.0008
Nagoya, AICHI	32	364	0.010 ± 0.0009	0.008 ± 0.0009

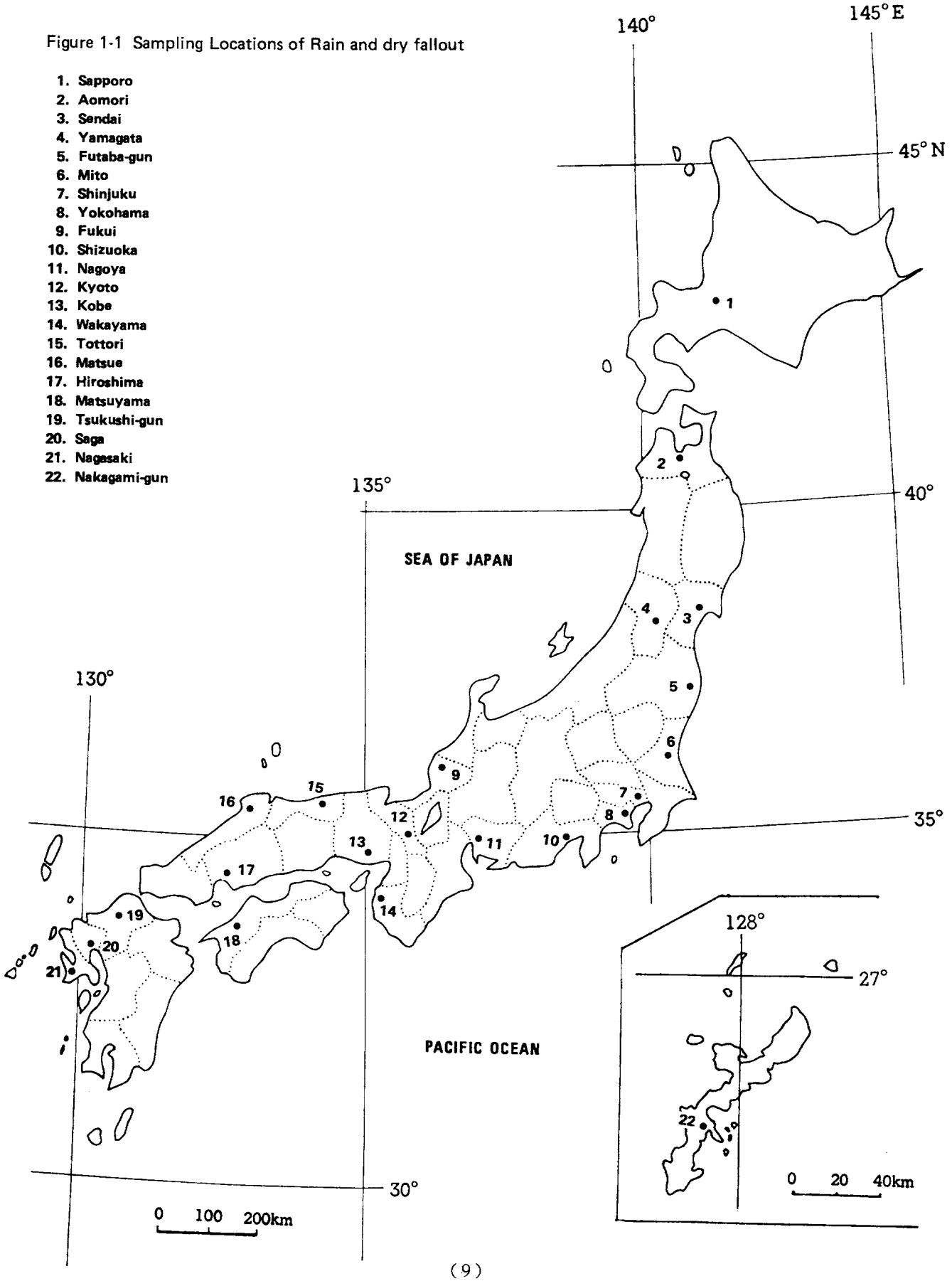
Location	Duration (Days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
Kyoto, KYOTO	32	292.7	0.003 ± 0.0006	0.004 ± 0.0007
Kobe, HYOGO	30	116.5	0.003 ± 0.0006	0.006 ± 0.0009
Wakayama, WAKAYAMA	30	92.2	0.003 ± 0.0008	0.006 ± 0.0009
Tottori, TOTTORI	32	251.18	0.007 ± 0.0009	0.007 ± 0.0009
Matsue, SHIMANE	30	340.3	0.005 ± 0.0007	0.008 ± 0.0009
Hiroshima, HIROSHIMA	28	312.8	0.008 ± 0.0009	0.005 ± 0.0008
Matsuyama, EHIME	32	313	0.004 ± 0.0008	0.005 ± 0.0008
Tsukushi-gun, FUKUOKA	32	496.4	0.003 ± 0.0007	0.010 ± 0.0009
Saga, SAGA	33	614.2	0.004 ± 0.0007	0.003 ± 0.0007
Nagasaki, NAGASAKI	32	410.0	0.003 ± 0.0006	0.004 ± 0.0007
Nakagami-gun, OKINAWA	33	89.5	0.002 ± 0.0006	0.003 ± 0.0007
Yamagata, YAMAGATA	30	192.5	0.006 ± 0.0008	0.006 ± 0.0009
September, 1980				
Sapporo, HOKKAIDO	31	34.5	0.002 ± 0.0006	0.006 ± 0.0008
Aomori, AOMORI	31	89.05	0.006 ± 0.0008	0.008 ± 0.0008
Sendai, MIYAGI	30	54.3	0.003 ± 0.0007	0.004 ± 0.0007
Yamagata, YAMAGATA	32	53.0	0.002 ± 0.0007	0.007 ± 0.0008
Futaba-gun, FUKUSHIMA	31	144	0.005 ± 0.0007	0.008 ± 0.0009
Mito, IBARAGI	31	87.5	0.004 ± 0.0007	0.009 ± 0.0009
Shinjuku, TOKYO	31	162.4	0.007 ± 0.0009	0.011 ± 0.0009
Yokohama, KANAGAWA	31	225.5	0.007 ± 0.0008	0.012 ± 0.0010
Fukui, FUKUI	30	113.2	0.003 ± 0.0008	0.009 ± 0.0009
Shizuoka, SHIZUOKA	31	259.5	0.005 ± 0.0007	0.006 ± 0.0008
Nagoya, AICHI	31	108	0.003 ± 0.0006	0.005 ± 0.0008
Kyoto, KYOTO	31	202.3	0.003 ± 0.0007	0.006 ± 0.0007
Kobe, HYOGO	33	224.5	0.005 ± 0.0008	0.006 ± 0.0009
Wakayama, WAKAYAMA	31	135.5	0.005 ± 0.0008	0.004 ± 0.0008
Tottori, TOTTORI	31	128.66	0.010 ± 0.0009	0.012 ± 0.0010
Matsue, SHIMANE	32	58.5	0.004 ± 0.0008	0.007 ± 0.0008
Hiroshima, HIROSHIMA	29	57.8	0.008 ± 0.0009	0.009 ± 0.0009
Matsuyama, EHIME	31	103.0	0.007 ± 0.0009	0.005 ± 0.0008
Tsukushi-gun, FUKUOKA	31	261.6	0.002 ± 0.0007	0.003 ± 0.0007
Saga, SAGA	34	120.2	0.002 ± 0.0006	0.003 ± 0.0007
Nagasaki, NAGASAKI	31	156.0	0.003 ± 0.0007	0.002 ± 0.0007
Nakagami-gun, OKINAWA	30	154.0	0.001 ± 0.0006	0.002 ± 0.0006
October, 1980				
Sapporo, HOKKAIDO	32	128.0	0.007 ± 0.0008	0.010 ± 0.0009
Aomori, AOMORI	32	89.0	0.006 ± 0.0009	0.011 ± 0.0009
Sendai, MIYAGI	33	153.3	0.005 ± 0.0009	0.008 ± 0.0009
Yamagata, YAMAGATA	32	114.0	0.004 ± 0.0012	0.005 ± 0.0013

Location	Duration (Days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
Futaba-gun, FUKUSHIMA	32	205	0.006 ± 0.0007	0.006 ± 0.0008
Mito, IBARAGI	32	155.0	0.004 ± 0.0007	0.005 ± 0.0008
Shinjuku, TOKYO	32	136.8	0.005 ± 0.0008	0.007 ± 0.0008
Yokohama, KANAGAWA	31	153.7	0.005 ± 0.0007	0.005 ± 0.0008
Fukui, FUKUI	36	316.0	0.013 ± 0.0010	0.022 ± 0.0012
Shizuoka, SHIZUOKA	32	167.0	0.005 ± 0.0008	0.008 ± 0.0009
Nagoya, AICHI	32	167	0.003 ± 0.0006	0.004 ± 0.0007
Kyoto, KYOTO	32	150.1	0.002 ± 0.0006	0.003 ± 0.0007
Kobe, HYOGO	32	150.1	0.002 ± 0.0006	0.004 ± 0.0007
Wakayama, WAKAYAMA	38	246.7	0.004 ± 0.0007	0.007 ± 0.0009
Tottori, TOTTORI	32	243.58	0.012 ± 0.0011	0.012 ± 0.0010
Matsue, SHIMANE	31	240.8	0.007 ± 0.0010	0.011 ± 0.0010
Hiroshima, HIROSHIMA	37	133.3	0.006 ± 0.0008	0.005 ± 0.0008
Matsuyama, EHIME	32	122.5	0.004 ± 0.0007	0.009 ± 0.0009
Tsukushi-gun, FUKUOKA	32	134.2	0.004 ± 0.0007	0.006 ± 0.0008
Saga, SAGA	31	147.9	0.004 ± 0.0007	0.003 ± 0.0007
Nagasaki, NAGASAKI	32	246.0	0.004 ± 0.0008	0.007 ± 0.0008
Nakagami-gun, OKINAWA	2	151.0	0.003 ± 0.0006	0.003 ± 0.0007
November, 1980				
Sapporo, HOKKAIDO	31	61.5	0.006 ± 0.0008	0.008 ± 0.0009
Aomori, AOMORI	31	93	0.011 ± 0.0010	0.012 ± 0.0010
Sendai, MIYAGI	33	26.6	0.006 ± 0.0009	0.006 ± 0.0008
Yamagata, YAMAGATA	30	36.5	0.002 ± 0.0007	0.007 ± 0.0008
Futaba-gun, FUKUSHIMA	31	93	0.004 ± 0.0008	0.007 ± 0.0008
Mito, IBARAGI	31	78.5	0.006 ± 0.0015	0.005 ± 0.0008
Shinjuku, TOKYO	31	140	0.006 ± 0.0009	0.010 ± 0.0009
Yokohama, KANAGAWA	32	144.0	0.002 ± 0.0006	0.008 ± 0.0008
Fukui, FUKUI	30	58.2	0.007 ± 0.0009	0.015 ± 0.0010
Shizuoka, SHIZUOKA	33	148.0	0.004 ± 0.0008	0.007 ± 0.0008
Nagoya, AICHI	34	109	0.007 ± 0.0009	0.011 ± 0.0009
Kyoto, KYOTO	31	101.0	0.006 ± 0.0009	0.006 ± 0.0008
Kobe, HYOGO	28	35.8	0.003 ± 0.0006	0.003 ± 0.0007
Wakayama, WAKAYAMA	35	76.5	0.013 ± 0.0011	0.014 ± 0.0011
Tottori, TOTTORI	31	142.26	0.016 ± 0.0012	0.020 ± 0.0012
Matsue, SHIMANE	32	89.0	0.008 ± 0.0009	0.013 ± 0.0010
Hiroshima, HIROSHIMA	33	82.1	0.012 ± 0.0010	0.005 ± 0.0008
Matsuyama, EHIME	31	50	0.006 ± 0.0009	0.007 ± 0.0009
Tsukushi-gun, FUKUOKA	30	73.0	0.004 ± 0.0008	0.006 ± 0.0008
Saga, SAGA	30	47.1	0.005 ± 0.0008	0.008 ± 0.0009
Nagasaki, NAGASAKI	31	43.0	0.004 ± 0.0008	0.007 ± 0.0008
Nakagami-gun, OKINAWA	62	234.5	0.003 ± 0.0007	0.002 ± 0.0007

Location	Duration (Days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
December, 1980				
Sapporo, HOKKAIDO	26	139.0	0.011 ± 0.0009	0.016 ± 0.0011
Aomori, AOMORI	37	74.65	0.010 ± 0.0010	0.020 ± 0.0012
Sendai, MIYAGI	35	146	0.008 ± 0.0009	0.009 ± 0.0009
Yamagata, YAMAGATA	27	135.0	0.007 ± 0.0008	0.012 ± 0.0010
Futaba-gun, FUKUSHIMA	36	143	0.008 ± 0.0009	0.015 ± 0.0010
Mito, IBARAGI	37	42.0	0.005 ± 0.0007	0.007 ± 0.0008
Shinjuku, TOKYO	32	36.8	0.004 ± 0.0007	0.007 ± 0.0008
Yokohama, KANAGAWA	37	54.8	0.005 ± 0.0008	0.008 ± 0.0009
Fukui, FUKUI	34	474.6	0.059 ± 0.0020	0.089 ± 0.0023
Shizuoka, SHIZUOKA	35	46.5	0.004 ± 0.0008	0.014 ± 0.0010
Nagoya, AICHI	33	39	0.007 ± 0.0008	0.007 ± 0.0008
Kyoto, KYOTO	36	49.1	0.005 ± 0.0008	0.007 ± 0.0009
Kobe, HYOGO	29	58.6	0.007 ± 0.0008	0.012 ± 0.0010
Wakayama, WAKAYAMA	26	14.5	0.002 ± 0.0007	0.003 ± 0.0008
Tottori, TOTTORI	37	180.78	0.030 ± 0.0015	0.050 ± 0.0018
Matsue, SHIMANE	31	168.7	0.032 ± 0.0017	0.050 ± 0.0018
Hiroshima, HIROSHIMA	34	22.6	0.010 ± 0.0009	0.015 ± 0.0011
Matsuyama, EHIME	26	44.5	0.011 ± 0.0010	0.022 ± 0.0012
Tsukushi-gun, FUKUOKA	38	54.8	0.017 ± 0.0012	0.025 ± 0.0013
Saga, SAGA	41	50.1	0.005 ± 0.0009	0.009 ± 0.0009
Nagasaki, NAGASAKI	36	67.0	0.018 ± 0.0012	0.026 ± 0.0013
Nakagami-gun, OKINAWA	37	43.0	0.009 ± 0.0009	0.015 ± 0.0011

Figure 1-1 Sampling Locations of Rain and dry fallout

1. Sapporo
2. Aomori
3. Sendai
4. Yamagata
5. Futaba-gun
6. Mito
7. Shinjuku
8. Yokohama
9. Fukui
10. Shizuoka
11. Nagoya
12. Kyoto
13. Kobe
14. Wakayama
15. Tottori
16. Matsue
17. Hiroshima
18. Matsuyama
19. Tsukushi-gun
20. Saga
21. Nagasaki
22. Nakagami-gun



(1)-2 Strontium-90 and Cesium-137 in Rain and dry fallout (for WHO program)

(from Dec. 1979 to Dec. 1980)

– continued from No. 53 of this publication –

Table 1 -2: Strontium-90 and Cesium-137 in Rain and dry fallout

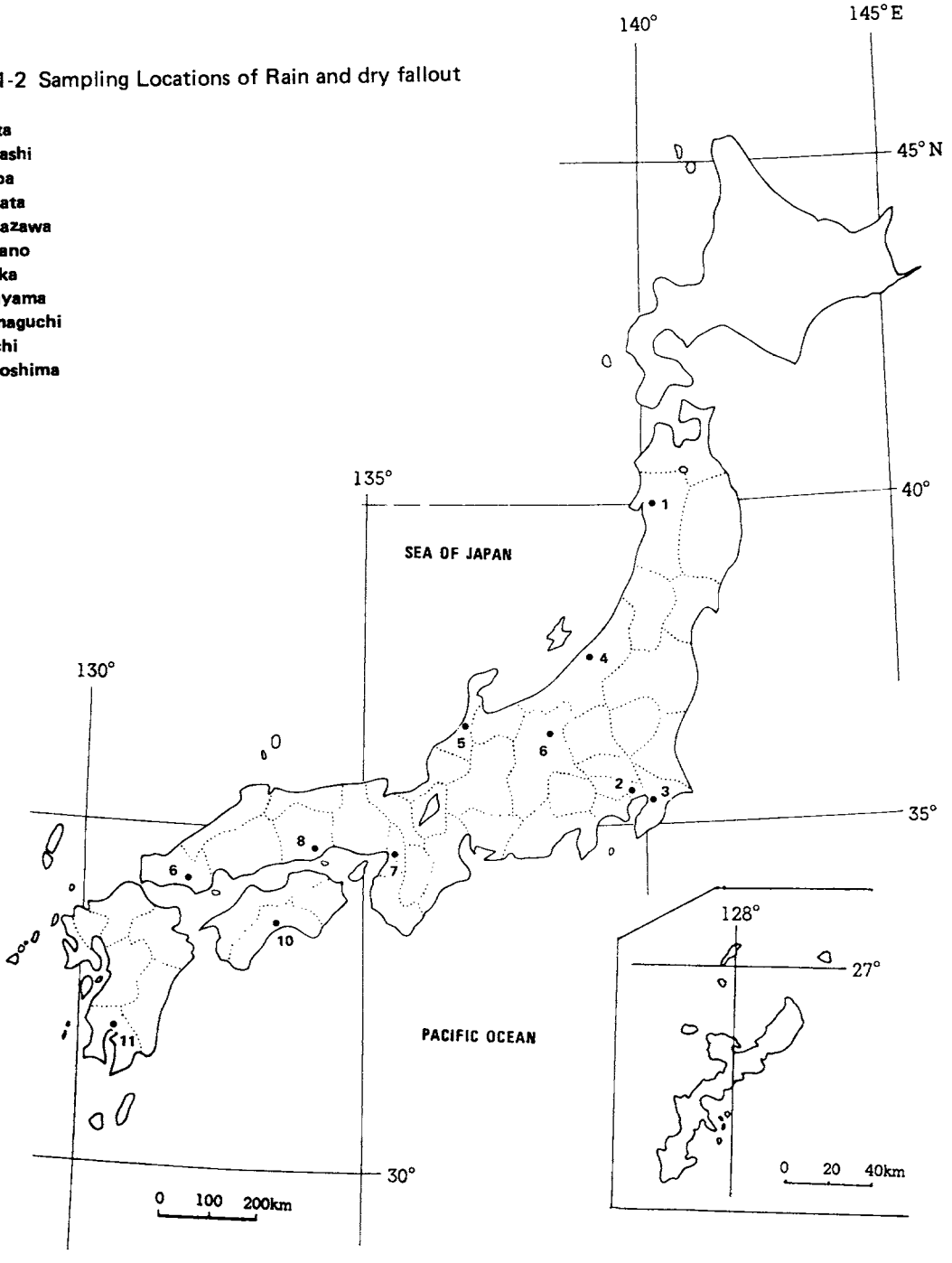
Location	Duration (Days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
December, 1979				
Itabashi, TOKYO	25	49.8	0.001 ± 0.0005	0.003 ± 0.0011
January, 1980				
Chiba, CHIBA	49	115.9	0.006 ± 0.0008	0.008 ± 0.0008
March, 1980				
Chiba, CHIBA	40	190.8	0.019 ± 0.0012	0.026 ± 0.0014
April, 1980				
Chiba, CHIBA	29	107.4	0.011 ± 0.0010	0.015 ± 0.0011
May, 1980				
Chiba, CHIBA	34	234.1	0.025 ± 0.0015	0.038 ± 0.0015
June, 1980				
Chiba, CHIBA	30	109.9	0.014 ± 0.0012	0.021 ± 0.0012
July, 1980				
Chiba, CHIBA	38	158.6	0.015 ± 0.0011	0.020 ± 0.0012
Niigata, NIIGATA	32	296.97	0.017 ± 0.0012	0.025 ± 0.0013
Nagano, NAGANO	32	171.0	0.010 ± 0.0009	0.013 ± 0.0010
Okayama, OKAYAMA	32	248.2	0.007 ± 0.0008	0.009 ± 0.0009
Yamaguchi, YAMAGUCHI	31	502	0.009 ± 0.0009	0.012 ± 0.0009
Kochi, KOCHI	32	329.0	0.015 ± 0.0011	0.018 ± 0.0011
Kagoshima, KAGOSHIMA	32	511	0.007 ± 0.0008	0.014 ± 0.0010
August, 1980				
Akita, AKITA	32	226.64	0.009 ± 0.0008	0.011 ± 0.0010
Niigata, NIIGATA	32	219.01	0.004 ± 0.0007	0.006 ± 0.0008
Kanazawa, ISHIKAWA	33	213.0	0.004 ± 0.0009	0.005 ± 0.0008
Nagano, NAGANO	32	108.0	0.003 ± 0.0006	0.005 ± 0.0008
Osaka, OSAKA	32	193	0.003 ± 0.0008	0.005 ± 0.0008
Okayama, OKAYAMA	32	251.5	0.005 ± 0.0007	0.006 ± 0.0008
Yamaguchi, YAMAGUCHI	32	437.0	0.004 ± 0.0007	0.005 ± 0.0007
Kochi, KOCHI	32	553.9	0.013 ± 0.0011	0.017 ± 0.0011
Kagoshima, KAGOSHIMA	31	214	0.003 ± 0.0007	0.004 ± 0.0007
Chiba, CHIBA	26	68.7	0.004 ± 0.0007	0.004 ± 0.0007

Location	Duration (Days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
September, 1980				
Chiba, CHIBA	31	118.7	0.006 ± 0.0008	0.008 ± 0.0009
Akita, AKITA	31	100.01	0.005 ± 0.0008	0.007 ± 0.0008
Niigata, NIIGATA	31	66.39	0.005 ± 0.0007	0.007 ± 0.0009
Kanazawa, ISHIKAWA	31	89.5	0.005 ± 0.0008	0.008 ± 0.0009
Nagano, NAGANO	31	110.5	0.003 ± 0.0006	0.005 ± 0.0008
Osaka, OSAKA	31	145	0.004 ± 0.0007	0.003 ± 0.0007
Okayama, OKAYAMA	31	207.7	0.002 ± 0.0007	0.003 ± 0.0007
Yamaguchi, YAMAGUCHI	31	87.5	0.002 ± 0.0006	0.003 ± 0.0007
Kochi, KOCHI	31	225.5	0.006 ± 0.0008	0.005 ± 0.0008
Kagoshima, KAGOSHIMA	31	184.2	0.003 ± 0.0006	0.006 ± 0.0008
October, 1980				
Chiba, CHIBA	35	163.0	0.005 ± 0.0009	0.005 ± 0.0008
Akita, AKITA	32	164.73	0.007 ± 0.0008	0.012 ± 0.0010
Niigata, NIIGATA	32	143.87	0.006 ± 0.0008	0.009 ± 0.0010
Kanagawa, ISHIKAWA	32	401.5	0.013 ± 0.0011	0.021 ± 0.0012
Nagano, NAGANO	32	141.0	0.001 ± 0.0006	0.003 ± 0.0007
Osaka, OSAKA	32	171.47	0.003 ± 0.0006	0.004 ± 0.0011
Okayama, OKAYAMA	32	71.1	0.003 ± 0.0006	0.004 ± 0.0007
Yamaguchi, YAMAGUCHI	35	177.5	0.007 ± 0.0008	0.006 ± 0.0008
Kochi, KOCHI	22	304.1	0.008 ± 0.0009	0.008 ± 0.0009
Kagoshima, KAGOSHIMA	35	210.5	0.002 ± 0.0006	0.004 ± 0.0007
November, 1980				
Chiba, CHIBA	28	158.9	0.007 ± 0.0008	0.008 ± 0.0008
Akita, AKITA	31	96.63	0.009 ± 0.0009	0.014 ± 0.0010
Niigata, NIIGATA	31	83.02	0.011 ± 0.0010	0.014 ± 0.0010
Kanazawa, ISHIKAWA	31	108.5	0.014 ± 0.0010	0.020 ± 0.0012
Nagano, NAGANO	31	52.0	0.003 ± 0.0007	0.006 ± 0.0008
Osaka, OSAKA	31	80.26	0.003 ± 0.0007	0.005 ± 0.0008
Okayama, OKAYAMA	31	54.9	0.003 ± 0.0007	0.006 ± 0.0008
Yamaguchi, YAMAGUCHI	31	101.0	0.010 ± 0.0009	0.013 ± 0.0010
Kochi, KOCHI	31	242.8	0.008 ± 0.0009	0.009 ± 0.0009
Kagoshima, KAGOSHIMA	30	43.8	0.003 ± 0.0007	0.004 ± 0.0007
December, 1980				
Chiba, CHIBA	36	58.1	0.005 ± 0.0009	0.006 ± 0.0008
Akita, AKITA	32	172.77	0.023 ± 0.0014	0.035 ± 0.0015
Niigata, NIIGATA	37	239.16	0.022 ± 0.0013	0.034 ± 0.0014
Kanazawa, ISHIKAWA	36	402	0.045 ± 0.0016	0.051 ± 0.0017
Nagano, NAGANO	36	118.5	0.005 ± 0.0008	0.008 ± 0.0009
Osaka, OSAKA	31	61.67	0.006 ± 0.0008	0.011 ± 0.0010
Okayama, OKAYAMA	36	20.4	0.003 ± 0.0007	0.003 ± 0.0007

Location	Duration (Days)	Precipitation (mm)	^{90}Sr (mCi/km^2)	^{137}Cs (mCi/km^2)
Yamaguchi, YAMAGUCHI	33	55.5	0.012 ± 0.0010	0.021 ± 0.0012
Kochi, KOCHI	37	33.1	0.006 ± 0.0009	0.006 ± 0.0008
Kagoshima, KAGOSHIMA	36	74.7	0.009 ± 0.0009	0.012 ± 0.0010

Figure 1-2 Sampling Locations of Rain and dry fallout

1. **Akita**
2. **Itabashi**
3. **Chiba**
4. **Niigata**
5. **Kanazawa**
6. **Nagano**
7. **Osaka**
8. **Okayama**
9. **Yamaguchi**
10. **Kochi**
11. **Kagoshima**



(2) Strontium-90 and Cesium-137 in Airborne dust (from April 1980 to Sept. 1980)

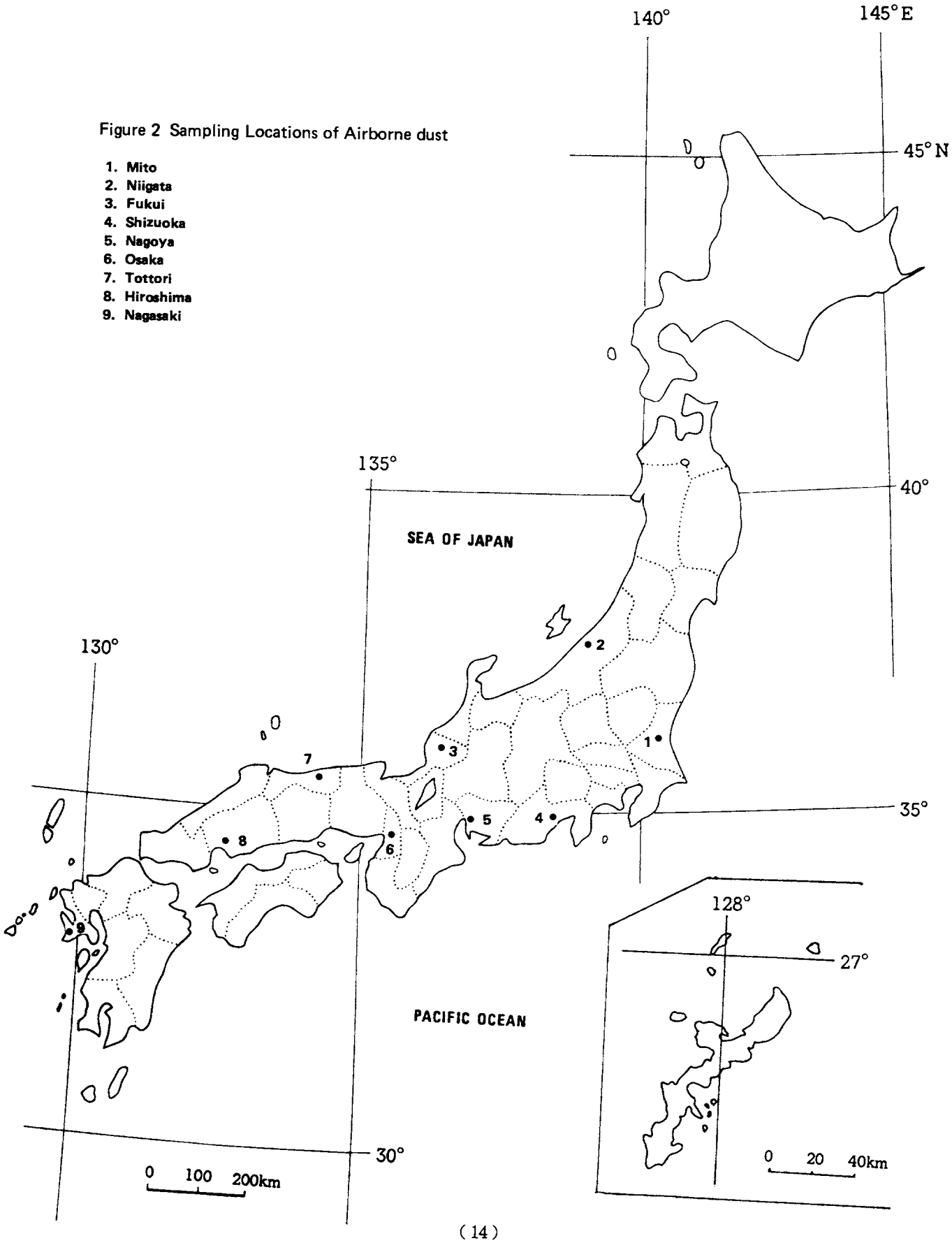
– continued from No. 53 of this publication –

Table 2: Strontium-90 and Cesium-137 in Airborne dust

Location	Sampling period	Absorption volume (m^3)	^{90}Sr (10^{-3} pCi/m^3)	^{137}Cs (10^{-3} pCi/m^3)
April ~ June 1980				
Shizuoka, SHIZUOKA	4 ~ 6	10,226	0.3 ± 0.04	0.5 ± 0.03
Nagasaki, NAGASAKI	4 ~ 6	10,349	0.4 ± 0.04	0.8 ± 0.04
July ~ September 1980				
Mito, IBARAGI	7 ~ 9	12,096	0.03±0.02	0.1 ± 0.02
Niigata, NIIGATA	7 ~ 9	10,780	0.2 ± 0.03	0.4 ± 0.03
Fukui, FUKUI	7 ~ 9	24,355	0.1 ± 0.02	0.3 ± 0.02
Shizuoka, SHIZUOKA	7 ~ 9	11,713	0.1 ± 0.03	0.1 ± 0.02
Nagoya, AICHI	7 ~ 9	10,739	0.1 ± 0.03	0.1 ± 0.02
Osaka, OSAKA	7 ~ 9	7,776	0.04±0.03	0.03±0.03
Tottori, TOTTORI	7 ~ 9	12,612	0.1 ± 0.02	0.1 ± 0.02
Hiroshima, HIROSHIMA	7 ~ 9	10,800	0.1 ± 0.03	0.2 ± 0.03
Nagasaki, NAGASAKI	7 ~ 9	10,546	0.1 ± 0.03	0.1 ± 0.03

Figure 2 Sampling Locations of Airborne dust

1. Mito
2. Niigata
3. Fukui
4. Shizuoka
5. Nagoya
6. Osaka
7. Tottori
8. Hiroshima
9. Nagasaki



(3) Strontium-90 and Cesium-137 in Service water (from June 1980 to Dec. 1980)

– continued from No. 53 of this publication –

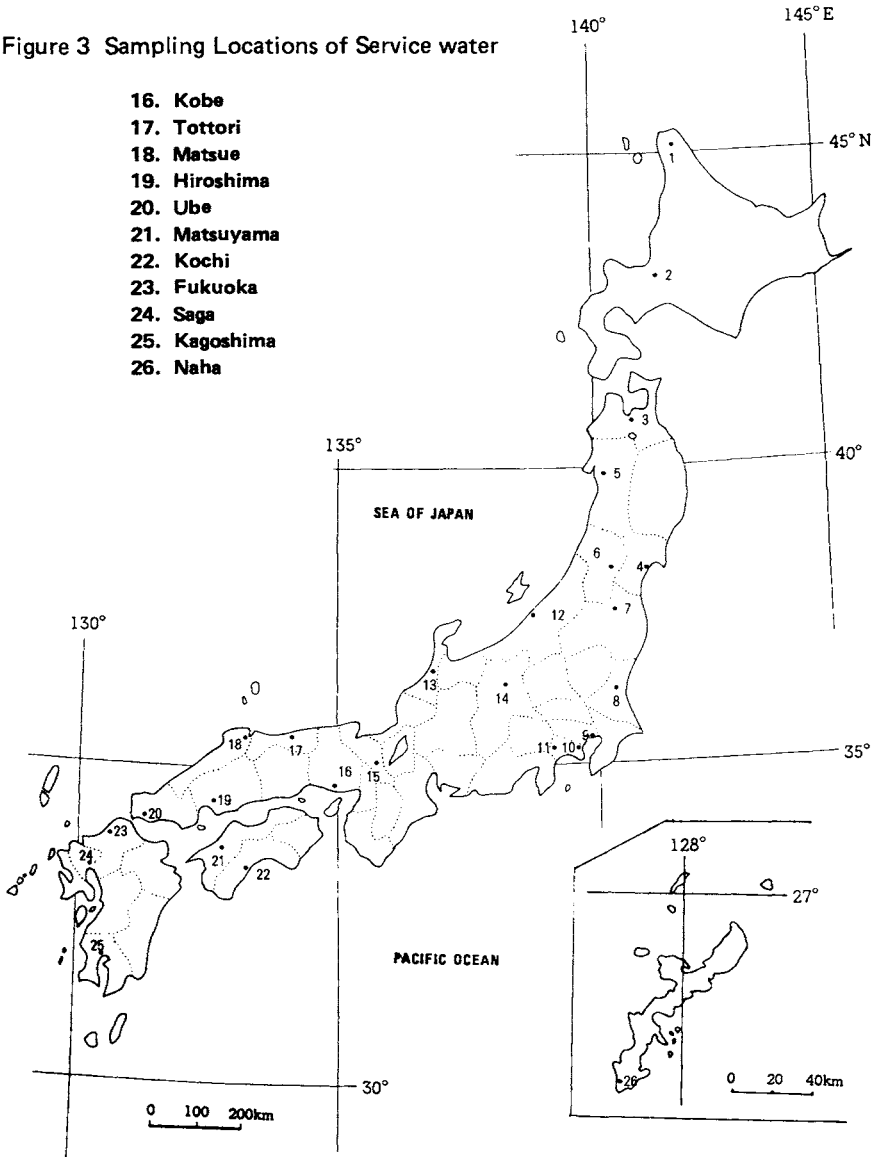
Table 3: Strontium-90 and Cesium-137 in Service water

Location	pH	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)
(Source water)			
June, 1980			
Sapporo, HOKKAIDO	7.1	0.09 ± 0.006	0.03 ± 0.004
Katsushika, TOKYO	6.9	0.10 ± 0.006	0.02 ± 0.004
Fukuoka, FUKUOKA	7.15	0.10 ± 0.006	0.01 ± 0.003
November, 1980			
Kyoto, KYOTO	6.56	0.26 ± 0.009	0.01 ± 0.003
December, 1980			
Tsukui-gun, KANAGAWA	7.2	0.02 ± 0.004	0.003±0.003
(Tap water)			
June, 1980			
Aomori, AOMORI	7.5	0.06 ± 0.005	0.01 ± 0.003
Sendai, MIYAGI	7.51	0.09 ± 0.006	0.01 ± 0.003
Katsushika, TOKYO	6.7	0.10 ± 0.006	0.01 ± 0.003
Tottori, TOTTORI	7.5	0.09 ± 0.007	0.002±0.003
Matsue, SHIMANE	7.1	0.23 ± 0.009	0.01 ± 0.004
Matsuyama, EHIME	7.26	0.08 ± 0.005	0.004±0.003
Fukuoka, FUKUOKA	6.85	0.16 ± 0.007	0.004±0.003
Saga, SAGA	7.21	0.07 ± 0.005	0.002±0.003
Nagasaki, NAGASAKI		0.07 ± 0.005	0.01 ± 0.003
Naha, OKINAWA	7.2	0.19 ± 0.008	0.003±0.003
July, 1980			
Wakkanai, HOKKAIDO	6.6	0.39 ± 0.012	0.01 ± 0.003
Hiroshima, HIROSHIMA	7.4	0.12 ± 0.007	0.01 ± 0.003
Ube, YAMAGUCHI	6.0	0.09 ± 0.006	0.01 ± 0.003
Kagoshima, KAGOSHIMA		0.01 ± 0.003	0.00 ± 0.003
August, 1980			
Fukushima, FUKUSHIMA		0.15 ± 0.007	0.001±0.003
November, 1980			
Kyoto, KYOTO	6.30	0.25 ± 0.009	0.01 ± 0.003
December, 1980			
Akita, AKITA	6.83	0.15 ± 0.008	0.01 ± 0.003
Yamagata, YAMAGATA	6.76	0.09 ± 0.006	0.01 ± 0.003

Location	pH	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)
Mito, IBARAGI	6.4	0.06 ± 0.006	0.003±0.003
Yokohama, KANAGAWA	6.8	0.03 ± 0.004	0.004±0.003
Niigata, NIIGATA	6.98	0.17 ± 0.008	0.01 ± 0.003
Kanazawa, ISHIKAWA	6.6	0.15 ± 0.008	0.001±0.003
Nagano, NAGANO	7.2	0.04 ± 0.005	0.004±0.003
Kobe, HYOGO	6.4	0.19 ± 0.008	0.002±0.003
Matsuyama, EHIME	7.32	0.06 ± 0.005	0.002±0.003
Kochi, KOCHI	7.2	0.08 ± 0.006	0.00 ± 0.003
Kagoshima, KAGOSHIMA	6.7	0.001±0.003	0.00 ± 0.003

Figure 3 Figure 3 Sampling Locations of Service water

1. Wakkanai
2. Sapporo
3. Aomori
4. Sendai
5. Akita
6. Yamagata
7. Fukushima
8. Mito
9. Katsushika
10. Yokohama
11. Tsukui-gun
12. Niigata
13. Kanazawa
14. Nagano
15. Kyoto
16. Kobe
17. Tottori
18. Matsue
19. Hiroshima
20. Ube
21. Matsuyama
22. Kochi
23. Fukuoka
24. Saga
25. Kagoshima
26. Naha



(4) Strontium-90 and Cesium-137 in Freshwater (from May 1980 to Dec. 1980)

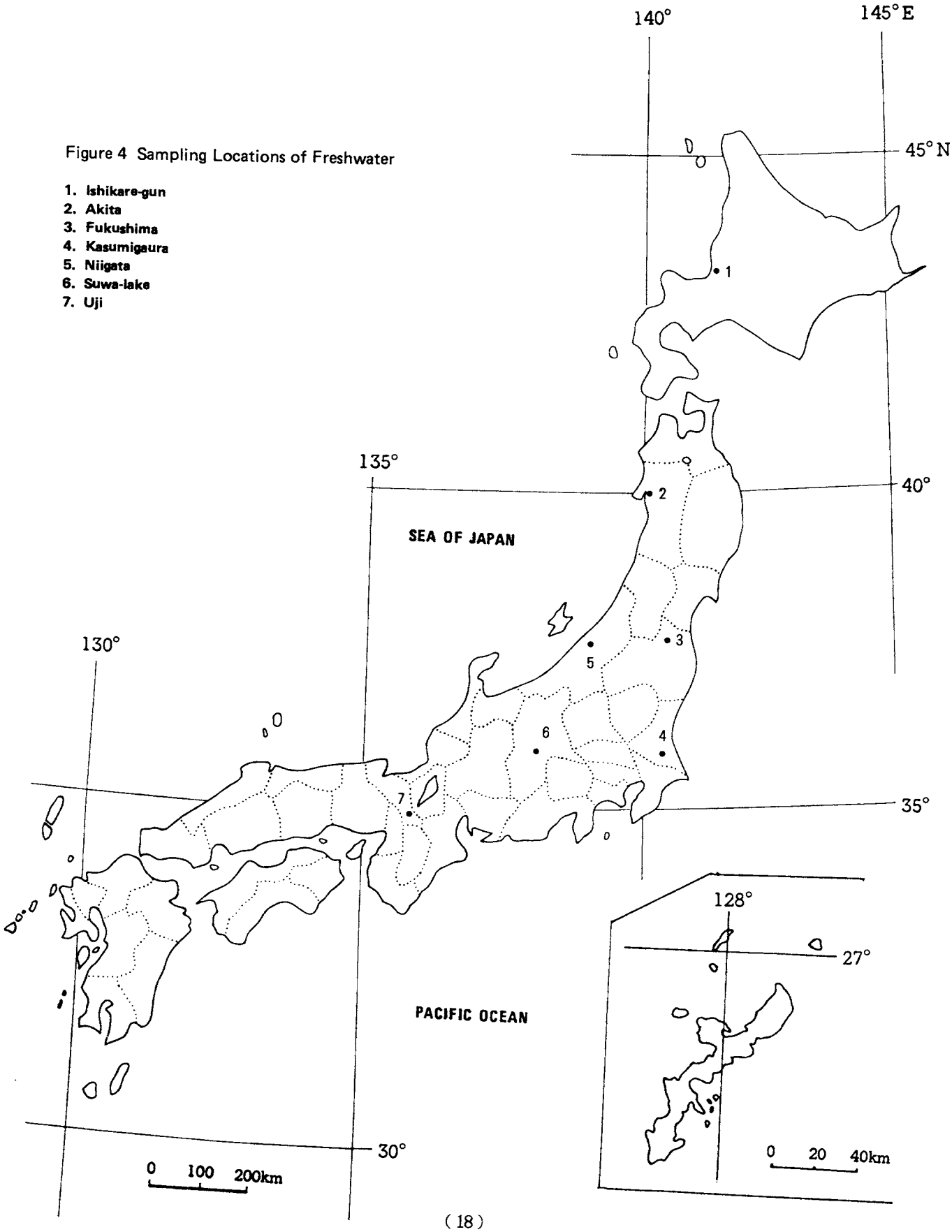
– continued from No. 53 of this publication –

Table 4: Strontium-90 and Cesium-147 in Freshwater

Location	pH	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)
May, 1980			
Kasumigaura, IBARAGI	9.0	0.27 ± 0.009	0.05 ± 0.005
July, 1980			
Ishikari-gun, HOKKAIDO	7.0	0.12 ± 0.007	0.02 ± 0.004
Akita, AKITA	6.9	0.15 ± 0.008	0.01 ± 0.003
October, 1980			
Fukushima, FUKUSHIMA	7.6	0.09 ± 0.006	0.02 ± 0.004
November, 1980			
Niigata, NIIGATA	6.9	0.23 ± 0.009	0.03 ± 0.004
December, 1980			
Suwa-lake, NAGANO	9.1	0.04 ± 0.005	0.01 ± 0.003
Uji, KYOTO	6.01	0.00 ± 0.003	0.00 ± 0.003

Figure 4 Sampling Locations of Freshwater

1. Ishikare-gun
2. Akita
3. Fukushima
4. Kasumigaura
5. Niigata
6. Suwa-lake
7. Uji



(5) Strontium-90 and Cesium-137 in Soil (from July 1979 to Oct. 1980)

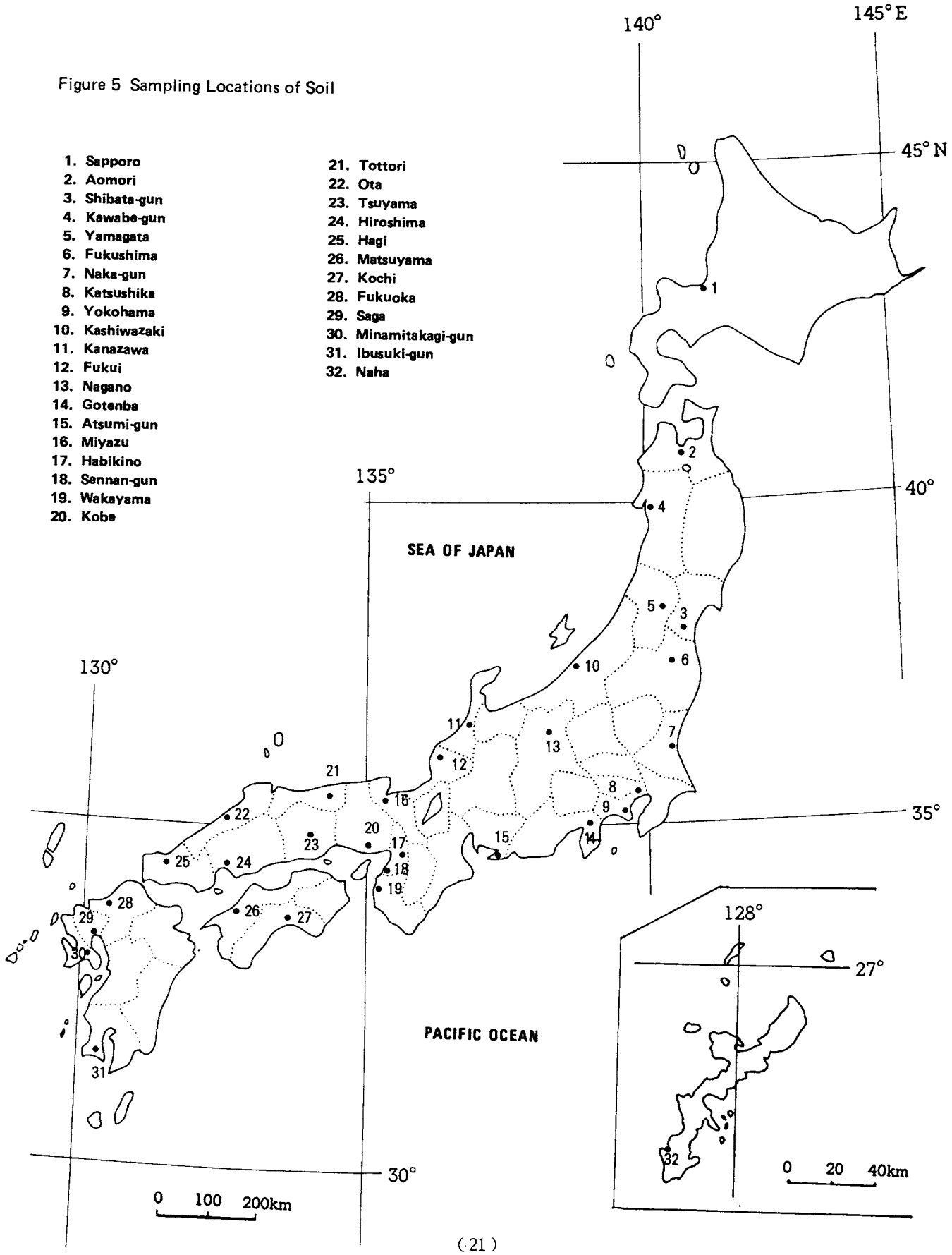
– continued from No. 52 of this publication –

Table 5: Strontium-90 and Cesium-137 in Soil

Location	Sampling Depth (cm)	^{90}Sr (pCi/kg)	^{90}Sr (mCi/km^2)	^{137}Cs (pCi/kg)	^{137}Cs (mCi/km^2)
July, 1979					
Kawabe-gun, AKITA	0 ~ 5	620 ± 14	20 ± 0.5	1300 ± 20	42 ± 0.6
"	5 ~ 20	780 ± 16	83 ± 1.7	1800 ± 20	190 ± 3
August, 1979					
Habikino, OSAKA	0 ~ 5	56 ± 4.7	2.6 ± 0.22	320 ± 10	14 ± 0.5
"	5 ~ 20	57 ± 4.7	9.4 ± 0.78	120 ± 7	19 ± 1.1
Naha, OKINAWA	0 ~ 5	94 ± 6.5	5.3 ± 0.37	250 ± 9	14 ± 0.5
"	5 ~ 20	94 ± 6.7	23 ± 1.6	150 ± 7	36 ± 1.7
May, 1980					
Atsumi-gun, AICHI	0 ~ 5	82 ± 5.2	1.0 ± 0.07	390 ± 10	4.9 ± 0.13
"	5 ~ 20	79 ± 5.2	7.8 ± 0.51	190 ± 7	19 ± 0.7
June, 1980					
Tsuyama, OKAYAMA	0 ~ 5	45 ± 4.4	1.6 ± 0.16	96 ± 5.6	3.4 ± 0.20
"	5 ~ 20	40 ± 4.5	4.2 ± 0.47	97 ± 5.7	10 ± 0.6
Naha, OKINAWA	0 ~ 5	84 ± 6.2	4.6 ± 0.34	230 ± 8	13 ± 0.5
"	5 ~ 20	74 ± 4.9	21 ± 1.4	130 ± 7	37 ± 1.9
July, 1980					
Aomori, AOMORI	0 ~ 5	92 ± 5.7	3.1 ± 0.19	62 ± 4.9	2.1 ± 0.17
"	5 ~ 20	17 ± 3.6	2.3 ± 0.48	2.1 ± 2.74	0.3 ± 0.36
Kawabe-gun, AKITA	0 ~ 5	780 ± 15	37 ± 0.7	1500 ± 20	73 ± 1.0
"	5 ~ 20	1100 ± 20	120 ± 2	2300 ± 30	260 ± 3
Yamagata, YAMAGATA	0 ~ 5	280 ± 9	27 ± 0.9	240 ± 8	23 ± 0.8
"	5 ~ 20	140 ± 7	12 ± 0.6	100 ± 6	8.5 ± 0.48
Fukushima, FUKUSHIMA	0 ~ 5	320 ± 10	5.4 ± 0.17	570 ± 13	9.8 ± 0.22
"	5 ~ 20	70 ± 5.5	4.8 ± 0.38	50 ± 4.9	3.4 ± 0.33
Katsushika, TOKYO	0 ~ 5	43 ± 4.9	3.8 ± 0.44	23 ± 3.8	2.0 ± 0.34
"	5 ~ 20	16 ± 3.5	3.9 ± 0.87	16 ± 3.6	3.9 ± 0.90
Kashiwazaki, NIIGATA	0 ~ 5	180 ± 7	16 ± 0.7	550 ± 13	48 ± 1.1
"	5 ~ 20	310 ± 10	53 ± 1.7	640 ± 14	110 ± 2
Kanazawa, ISHIKAWA	0 ~ 5	190 ± 8	7.8 ± 0.34	420 ± 11	17 ± 0.5
"	5 ~ 20	270 ± 9	25 ± 0.9	650 ± 14	60 ± 1.2
Fukui, FUKUI	0 ~ 5	180 ± 8	9.4 ± 0.40	870 ± 16	46 ± 0.8
"	5 ~ 20	160 ± 7	16 ± 0.8	800 ± 15	82 ± 1.5
Gotenba, SHIZUOKA	0 ~ 5	75 ± 5.6	2.0 ± 0.15	360 ± 10	9.4 ± 0.27
"	5 ~ 20	43 ± 4.3	4.7 ± 0.47	230 ± 9	25 ± 0.9

Location	Sampling Depth (cm)	^{90}Sr		^{137}Cs	
		(pCi/kg)	(mCi/km^2)	(pCi/kg)	(mCi/km^2)
Miyazu, KYOTO	0 ~ 5	250 ± 9	6.7 ± 0.23	3000 ± 30	79 ± 0.7
"	5 ~ 20	190 ± 8	29 ± 1.2	200 ± 8	31 ± 1.2
Sennan-gun, OSAKA	0 ~ 5	140 ± 7	8.0 ± 0.40	200 ± 8	11 ± 0.4
"	5 ~ 20	62 ± 5.1	12 ± 1.0	47 ± 4.3	8.9 ± 0.81
Tottori, TOTTORI	0 ~ 5	72 ± 5.2	4.0 ± 0.29	350 ± 10	19 ± 0.6
"	5 ~ 20	77 ± 5.4	16 ± 1.1	160 ± 7	32 ± 1.4
Ota, SHIMANE	0 ~ 5	130 ± 7	5.6 ± 0.29	830 ± 15	35 ± 0.6
"	5 ~ 20	92 ± 5.8	13 ± 0.8	670 ± 14	97 ± 2.0
Matsuyama, EHIME	0 ~ 5	68 ± 5.2	3.2 ± 0.24	140 ± 7	6.5 ± 0.31
"	5 ~ 20	54 ± 4.6	3.2 ± 0.27	210 ± 8	12 ± 0.46
Fukuoka, FUKUOKA	0 ~ 5	450 ± 12	17 ± 0.4	910 ± 16	34 ± 0.6
"	5 ~ 20	280 ± 10	37 ± 1.2	240 ± 8	31 ± 1.1
Minamitakagi-gun, NAGASAKI	0 ~ 5	450 ± 12	13 ± 0.4	2800 ± 30	84 ± 0.8
"	5 ~ 20	350 ± 11	50 ± 1.5	780 ± 15	110 ± 2
Ibusuki-gun, KAGOSHIMA	0 ~ 5	160 ± 7	9.6 ± 0.44	810 ± 15	48 ± 0.9
"	5 ~ 20	270 ± 9	40 ± 1.3	670 ± 13	99 ± 2
Matsuyama, EHIME	0 ~ 5	68 ± 5.2	3.2 ± 0.24	140 ± 7	6.5 ± 0.31
"	5 ~ 20	54 ± 4.6	3.2 ± 0.27	210 ± 8	12 ± 0.46
August, 1980					
Sapporo, HOKKAIDO	0 ~ 5	490 ± 12	18 ± 0.5	1300 ± 20	49 ± 0.7
"	5 ~ 20	180 ± 8	36 ± 1.7	150 ± 7	30 ± 1.4
Shibata-gun, MIYAGI	0 ~ 5	180 ± 9	4.4 ± 0.22	900 ± 16	22 ± 0.4
"	5 ~ 20	91 ± 5.9	3.9 ± 0.25	76 ± 5.4	3.3 ± 0.23
Naka-gun, IBARAGI	0 ~ 5	230 ± 8	13 ± 0.5	1100 ± 20	62 ± 1.0
"	5 ~ 20	220 ± 8	27 ± 1.0	62 ± 5.0	7.7 ± 0.62
Nagano, NAGANO	0 ~ 5	140 ± 7	8.3 ± 0.39	520 ± 12	30 ± 0.7
"	5 ~ 20	87 ± 5.6	14 ± 0.9	160 ± 7	25 ± 1.1
Kobe, HYOGO	0 ~ 5	48 ± 4.7	1.3 ± 0.13	300 ± 9	8.2 ± 0.26
"	5 ~ 20	54 ± 4.8	5.9 ± 0.52	170 ± 7	18 ± 0.8
Wakayama, WAKAYAMA	0 ~ 5	20 ± 3.4	0.5 ± 0.09	26 ± 3.9	0.7 ± 0.11
"	5 ~ 20	10 ± 3.1	0.8 ± 0.24	20 ± 3.7	1.6 ± 0.30
Hiroshima, HIROSHIMA	0 ~ 5	29 ± 3.8	0.9 ± 0.12	66 ± 4.9	2.1 ± 0.16
"	5 ~ 20	31 ± 3.9	3.9 ± 0.50	70 ± 5.1	8.9 ± 0.64
Kochi, KOCHI	0 ~ 5	400 ± 13	17 ± 0.5	1000 ± 20	44 ± 0.7
"	5 ~ 20	240 ± 11	25 ± 1.1	220 ± 8	23 ± 0.9
September, 1980					
Yokohama, KANAGAWA	0 ~ 5	460 ± 13	12 ± 0.3	1300 ± 20	33 ± 0.5
"	5 ~ 20	450 ± 13	42 ± 1.3	570 ± 13	54 ± 1.2
October, 1980					
Hagi, YAMAGUCHI	0 ~ 5	200 ± 8	6.2 ± 0.25	390 ± 11	12 ± 0.3
"	5 ~ 20	83 ± 5.7	8.0 ± 0.56	270 ± 9	26 ± 0.9
Saga, SAGA	0 ~ 5	53 ± 4.8	2.4 ± 0.21	38 ± 4.4	1.7 ± 0.20
"	5 ~ 20	24 ± 3.7	3.8 ± 0.58	11 ± 3.2	1.7 ± 0.50

Figure 5 Sampling Locations of Soil



(6) Strontium-90 and Cesium-137 in Sea water

(from June 1980 to Sept. 1980)

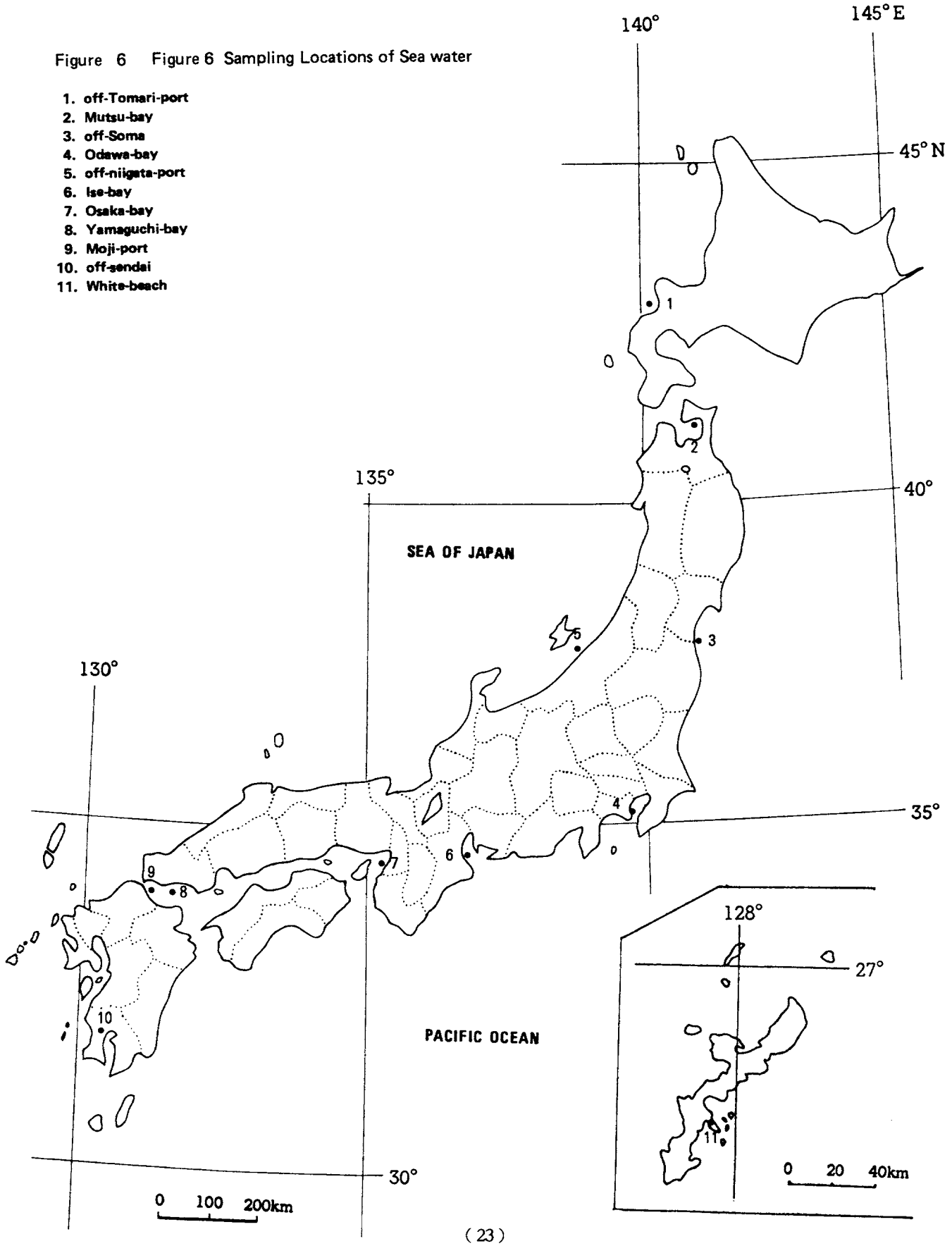
– continued from No. 52 of this publication –

Table 6: Strontium-90 and Cesium-137 in Sea water

Location	Cl (‰)	Sample volume analyzed (ℓ)	^{90}Sr (pCi/ℓ)	^{137}Cs (pCi/ℓ)
June, 1980				
off-Niigata-port, NIIGATA	16.9	39.0	0.13 ± 0.011	0.15 ± 0.013
White beach, OKINAWA	19.10	40.0	0.12 ± 0.011	0.14 ± 0.012
July, 1980				
Ise-bay, AICHI	6.0	36.5	0.12 ± 0.012	0.06 ± 0.010
Osaka-bay, OSAKA	8.79	40.0	0.19 ± 0.013	0.07 ± 0.010
Moji-port, FUKUOKA	16.3	40.0	0.12 ± 0.011	0.15 ± 0.012
August, 1980				
off-Tomari-port, HOKKAIDO	18.34	35.0	0.12 ± 0.013	0.15 ± 0.014
Mutsu-bay, AOMORI	17.8	40.0	0.12 ± 0.013	0.19 ± 0.013
Odawa-bay, KANAGAWA	18.46	40.0	0.11 ± 0.012	0.16 ± 0.013
Yamaguchi-bay, YAMAGUCHI	17.5	34.0	0.14 ± 0.014	0.10 ± 0.013
September, 1980				
off-Soma, FUKUSHIMA	12.0	40.0	0.14 ± 0.012	0.09 ± 0.011
off-Sendai, KAGOSHIMA	18.7	40.0	0.13 ± 0.012	0.13 ± 0.012

Figure 6 Figure 6 Sampling Locations of Sea water

1. off-Tomari-port
2. Mutsu-bay
3. off-Soma
4. Odawa-bay
5. off-niigata-port
6. Ise-bay
7. Osaka-bay
8. Yamaguchi-bay
9. Moji-port
10. off-sendai
11. White-beach



(7) Strontium-90 and Cesium-137 in Sea sediments

(from June 1980 to Sept. 1980)

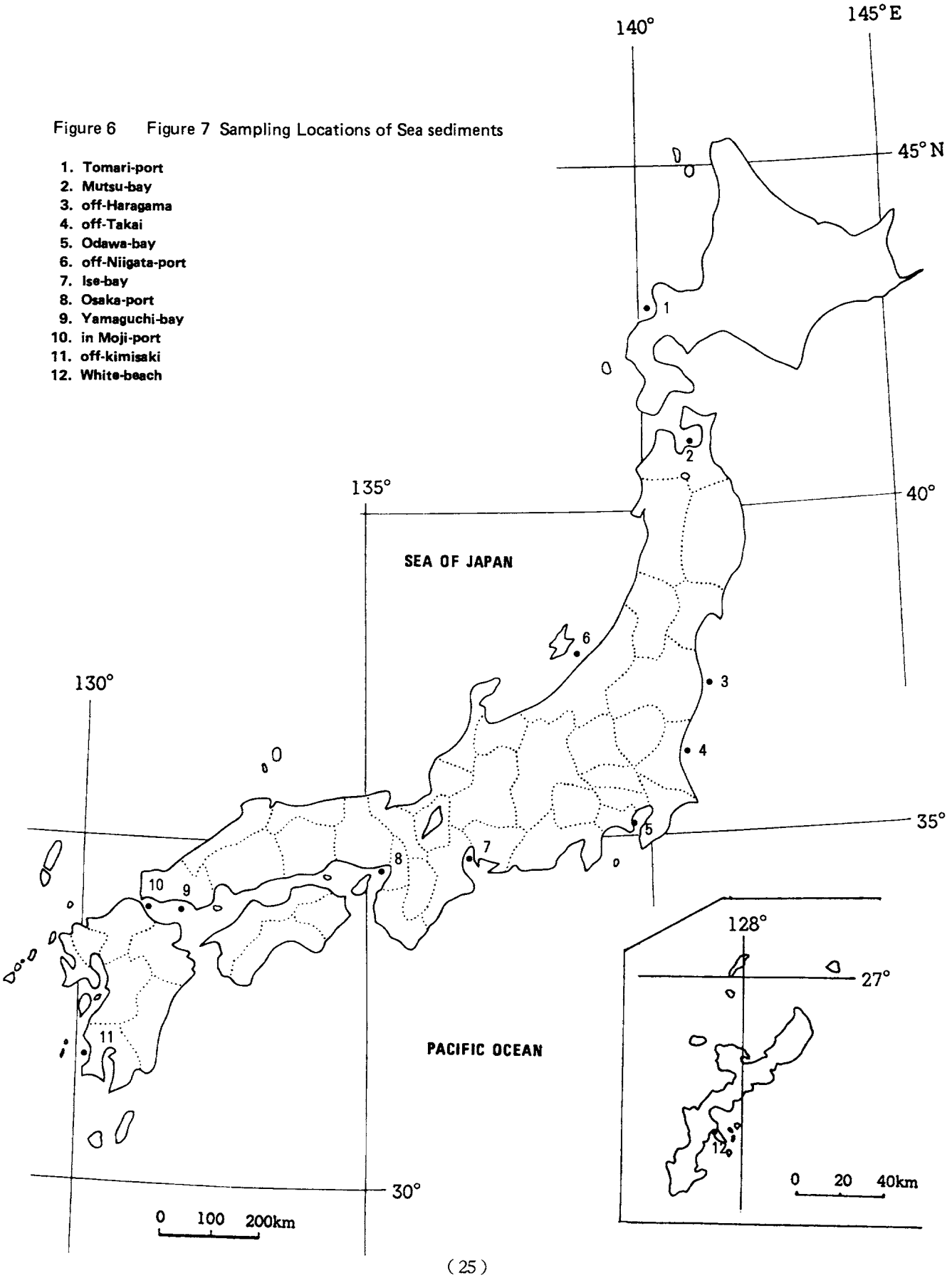
– continued from No. 52 of this publication –

Table 7: Strontium-90 and Cesium-137 in Sea sediments

Location	Depth (m)	^{90}Sr (pCi/kg)	^{137}Cs (pCi/kg)
June, 1980			
off-Niigata-port, NIIGATA	26	8 ± 2.8	62 ± 4.9
White-beach, OKINAWA	13.5	12 ± 2.8	25 ± 3.9
July, 1980			
off-Tokai, IBARAGI	9.0	8 ± 3.1	7 ± 3.4
Ise-bay, AICHI	23.0	7 ± 2.7	170 ± 7
Osaka-port, OSAKA	10	6 ± 2.9	170 ± 8
in Moji-port, FUKUOKA	10	8 ± 2.6	99 ± 6.0
August, 1980			
Tomari-port, HOKKAIDO	2	4 ± 2.6	25 ± 3.9
Mutsu-bay, AOMORI	11	20 ± 3.3	220 ± 8
Odawa-bay, KANAGAWA	7	9 ± 2.9	130 ± 7
Yamaguchi-bay, YAMAGUCHI	5	7 ± 2.8	160 ± 7
September, 1980			
off-Haragama, FUKUSHIMA	5	2 ± 2.5	14 ± 3.4
off-Kumisaki, KAGOSHIMA	6.3	2 ± 2.7	15 ± 3.7

Figure 6　Figure 7 Sampling Locations of Sea sediments

1. Tomari-port
2. Mutsu-bay
3. off-Haragama
4. off-Takai
5. Odawa-bay
6. off-Niigata-port
7. Ise-bay
8. Osaka-port
9. Yamaguchi-bay
10. in Moji-port
11. off-kimisaki
12. White-beach



(8) Strontium-90 and Cesium-137 in Total diet

(from June 1980 to Dec. 1980)

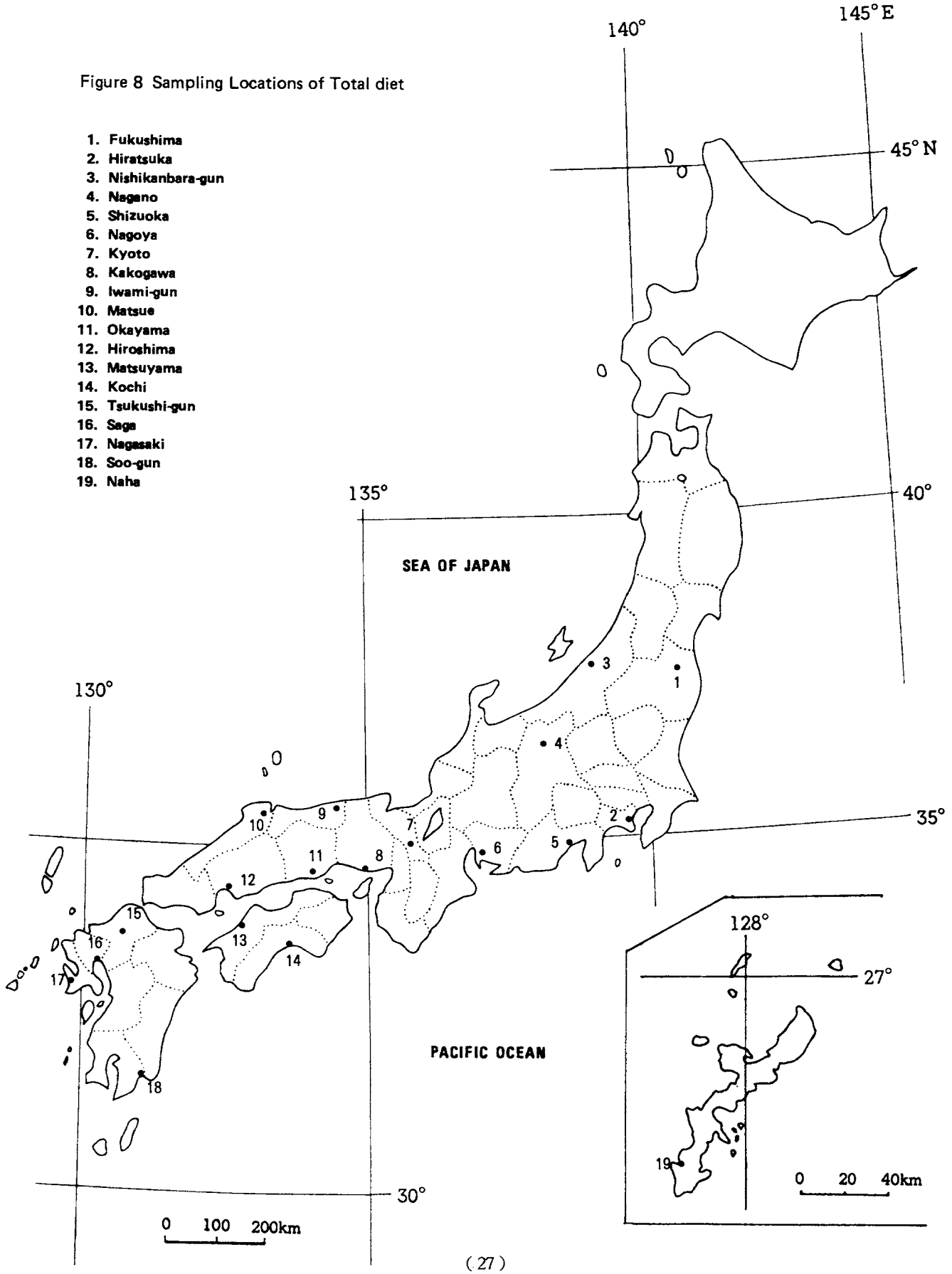
– continued from No. 53 of this publication –

Table 8: Strontium-90 and Cesium-137 in Total diet

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	(g/p/d)	(mg/p/d)	(mg/p/d)	pCi/p/d	S.U.	pCi/p/d	C.U.
June, 1980							
Fukushima, FUKUSHIMA	24.0	1330	2670	6.7 ± 0.47	5.0 ± 0.35	3.0 ± 0.31	1.1 ± 0.11
Kyoto, KYOTO	17.4	685	2670	3.4 ± 0.37	5.0 ± 0.55	2.8 ± 0.32	1.0 ± 0.12
Matsue, SHIMANE	21.1	709	2660	3.8 ± 0.44	5.3 ± 0.62	5.0 ± 0.40	1.9 ± 0.15
Naha, OKINAWA	9.94	502	1190	1.1 ± 0.34	2.3 ± 0.68	1.3± 0.28	1.1 ± 0.24
July, 1980							
Hiratsuka, KANAGAWA	15.5	560	2350	2.7 ± 0.32	4.8 ± 0.57	3.7 ± 0.31	1.6 ± 0.13
Nagasaki, NAGASAKI	14.9	482	2150	3.1 ± 0.33	6.5 ± 0.69	2.8 ± 0.27	1.3 ± 0.13
August, 1980							
Hiroshima, HIROSHIMA	14.3	275	1450	1.8 ± 0.29	6.6 ± 1.0	1.1 ± 0.21	0.8 ± 0.14
November, 1980							
Nishikanbara-gun, NIIGATA	20.0	600	2430	5.5 ± 0.50	9.1 ± 0.84	5.0 ± 0.37	2.1 ± 0.15
Shizuoka, SHIZUOKA	22.0	1060	2650	4.5 ± 0.48	4.3 ± 0.46	3.4 ± 0.36	1.3 ± 0.14
Nagoya, AICHI	18.6	1210	2540	3.4 ± 0.41	2.8 ± 0.34	2.0 ± 0.29	0.8 ± 0.11
Iwami-gun, TOTTORI	14.9	545	1760	6.0 ± 0.41	11 ± 0.8	2.7 ± 0.26	1.6 ± 0.15
Matsuyama, EHIME	14.5	466	1510	2.0 ± 0.29	4.4 ± 0.63	1.5 ± 0.20	1.0 ± 0.13
Okayama, OKAYAMA	14.8	482	1760	4.8 ± 0.38	10 ± 0.8	2.5 ± 0.24	1.4 ± 0.14
Kochi, KOCHI	16.3	963	1790	5.2 ± 0.41	5.4 ± 0.43	2.3 ± 0.26	1.3 ± 0.14
Tsukushi-gun, FUKUOKA	12.3	697	1590	2.2 ± 0.28	3.1 ± 0.40	1.7 ± 0.20	1.1 ± 0.12
Saga, SAGA	16.9	1710	1490	1.9 ± 0.33	1.1 ± 0.19	3.0 ± 0.31	2.0 ± 0.21
Soo-gun, KAGOSHIMA	11.4	443	1660	3.1 ± 0.27	7.0 ± 0.60	6.6 ± 0.29	4.0 ± 0.18
December, 1980							
Hiratsuka, KANAGAWA	16.3	693	2320	3.7 ± 0.39	5.4 ± 0.56	3.7 ± 0.31	1.6 ± 0.14
Nagano, NAGANO	16.1	455	1810	3.1 ± 0.36	6.7 ± 0.80	2.2 ± 0.24	1.2 ± 0.13
Kyoto, KYOTO	18.5	765	2600	5.6 ± 0.49	7.4 ± 0.64	3.3 ± 0.31	1.3 ± 0.12
Kakogawa, HYOGO	16.3	817	1970	4.4 ± 0.38	5.3 ± 0.47	2.6 ± 0.27	1.3 ± 0.14

Figure 8 Sampling Locations of Total diet

1. Fukushima
2. Hiratsuka
3. Nishikanbara-gun
4. Nagano
5. Shizuoka
6. Nagoya
7. Kyoto
8. Kakogawa
9. Iwami-gun
10. Matsue
11. Okayama
12. Hiroshima
13. Matsuyama
14. Kochi
15. Tsukushi-gun
16. Saga
17. Nagasaki
18. Soo-gun
19. Naha



(9)-1 Strontium-90 and Cesium-137 in Rice (producing districts)

(from Oct. 1980 to Dec. 1980)

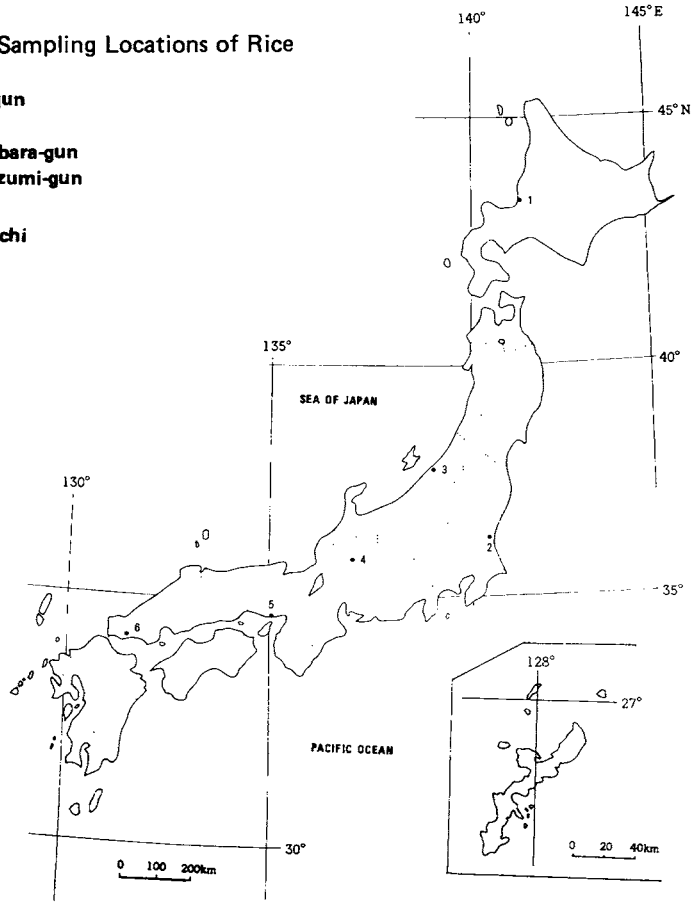
– continued from No. 53 of this publication –

Table 9-1: Strontium-90 and Cesium-137 in Rice

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	S.C.
October, 1980							
Mito, IBARAGI	0.506	0.0062	0.081	0.8 ± 0.24	13 ± 4.0	3.0 ± 0.33	3.7 ± 0.41
Nishikanbara-gun, NIIGATA	0.450	0.0038	0.076	0.7 ± 0.26	18 ± 7.0	1.2 ± 0.26	1.6 ± 0.34
Minamiazumi-gun, NAGANO	0.486	0.0063	0.092	0.4 ± 0.28	6.3 ± 4.4	0.6 ± 0.25	0.7 ± 0.27
Akashi, HYOGO	0.467	0.0062	0.094	0.6 ± 0.27	10 ± 4.3	0.4 ± 0.23	0.4 ± 0.25
November, 1980							
Ishikari-gun, HOKKAIDO	0.512	0.0049	0.11	0.4 ± 0.32	8.0 ± 6.5	1.0 ± 0.26	0.9 ± 0.25
December, 1980							
Yamaguchi, YAMAGUCHI	0.622	0.0064	0.12	0.7 ± 0.35	12 ± 5.4	0.7 ± 0.23	0.6 ± 0.19

Figure 9-1 Sampling Locations of Rice

1. **Ishikari-gun**
2. **Mito**
3. **Nishikanbara-gun**
4. **Minamiazumi-gun**
5. **Akashi**
6. **Yamaguchi**



(9)-2 Strontium-90 and Cesium-137 in Rice (consuming districts)

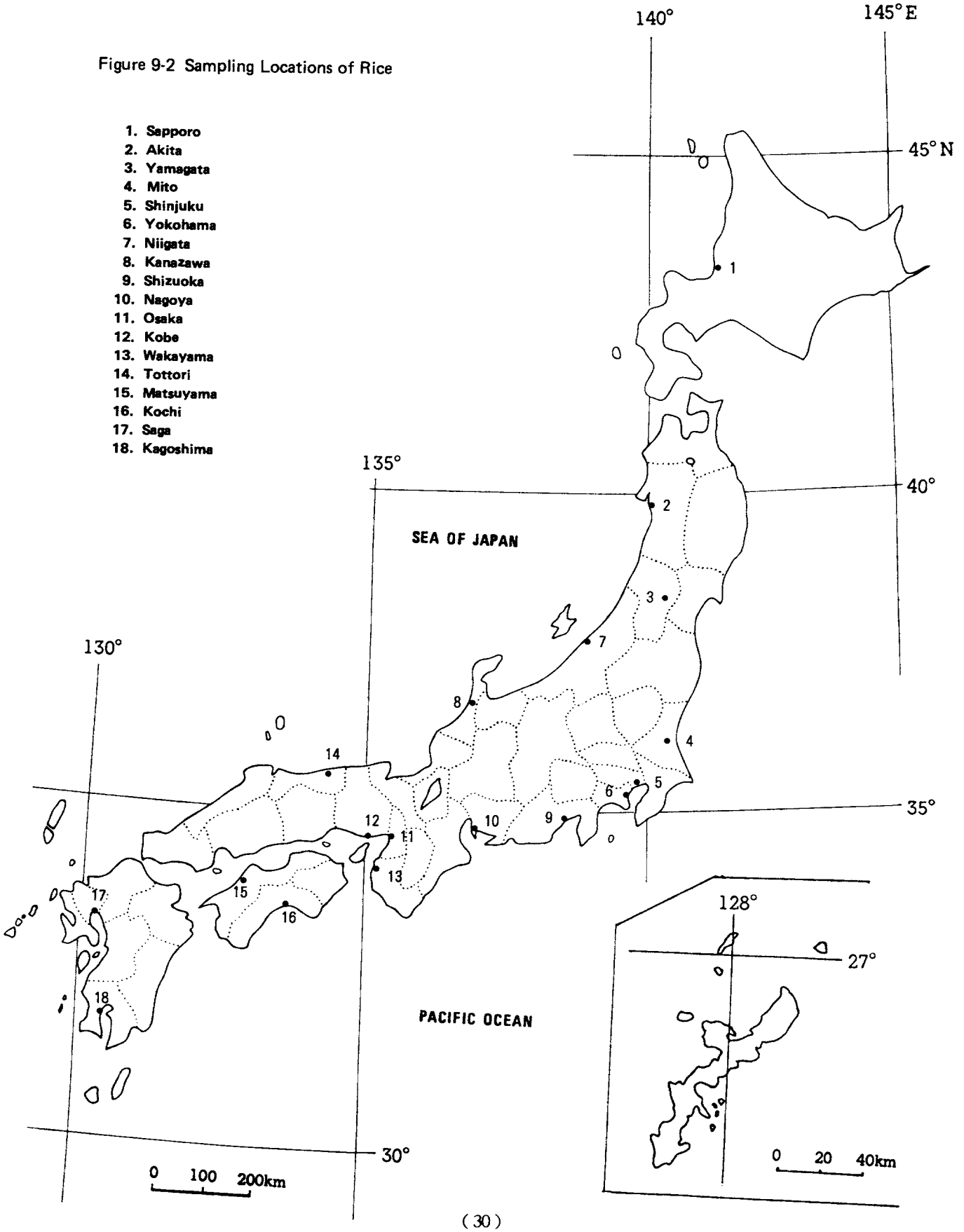
(from Sept. 1980 to Jan. 1981)

— continued from No. 53 of this publication —

Table 9-2: Strontium-90 and Cesium-137 in Rice

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
September, 1980							
Kanazawa, ISHIKAWA	0.540	0.0055	0.11	0.9 ± 0.26	16 ± 4.8	1.7 ± 0.31	1.6 ± 0.29
October, 1980							
Shinjuku, TOKYO	0.417	0.0052	0.087	0.8 ± 0.22	15 ± 4.2	2.2 ± 0.27	2.5 ± 0.31
Niigata, NIIGATA	0.400	0.0043	0.075	0.4 ± 0.22	10 ± 5.1	1.4 ± 0.25	1.9 ± 0.33
Matsuyama, EHIME	0.420	0.0052	0.10	0.8 ± 0.23	15 ± 4.4	0.5 ± 0.21	0.5 ± 0.20
November, 1980							
Sapporo, HOKKAIDO	0.409	0.0041	0.099	1.0 ± 0.26	24 ± 6.5	1.3 ± 0.23	1.3 ± 0.23
Akita, AKITA	0.393	0.0051	0.079	1.4 ± 0.28	27 ± 5.5	10 ± 0.4	13 ± 0.6
Mito, IBARAGI	0.451	0.0039	0.079	0.0 ± 0.23	0.0 ± 5.8	2.0 ± 0.27	2.6 ± 0.34
Shizuoka, SHIZUOKA	0.410	0.0047	0.083	0.2 ± 0.23	4.6 ± 4.9	1.8 ± 0.25	2.2 ± 0.30
Osaka, OSAKA	0.434	0.0051	0.11	1.1 ± 0.24	23 ± 4.8	3.7 ± 0.32	3.5 ± 0.31
Saga, SAGA	0.683	0.0070	0.13	0.3 ± 0.20	4.1 ± 2.9	0.6 ± 0.19	0.5 ± 0.14
Kagoshima, KAGOSHIMA	0.403	0.0049	0.071	0.4 ± 0.24	8.4 ± 5.0	6.7 ± 0.38	9.4 ± 0.53
December, 1980							
Yamagata, YAMAGATA	0.452	0.0047	0.099	0.3 ± 0.25	6.4 ± 5.4	1.1 ± 0.26	1.1 ± 0.26
Yokohama, KANAGAWA	0.391	0.0040	0.079	0.3 ± 0.21	8.0 ± 5.4	2.2 ± 0.26	2.8 ± 0.33
Nagoya, AICHI	0.487	0.0048	0.12	0.1 ± 0.27	1.2 ± 5.6	2.1 ± 0.31	1.8 ± 0.26
Kobe, HYOGO	0.463	0.0050	0.095	0.9 ± 0.28	18 ± 5.7	4.9 ± 0.36	5.1 ± 0.38
Tottori, TOTTORI	0.357	0.0055	0.070	0.9 ± 0.23	16 ± 4.2	1.0 ± 0.20	1.4 ± 0.29
Kochi, KOCHI	0.521	0.0038	0.12	0.2 ± 0.29	5.2 ± 7.8	0.7 ± 0.27	0.6 ± 0.23
January, 1981							
Wakayama, WAKAYAMA	0.450	0.0048	0.085	0.2 ± 0.30	4.9 ± 6.4	2.3 ± 0.29	2.7 ± 0.34

Figure 9-2 Sampling Locations of Rice



(10)-1 Strontium-90 and Cesium-137 in Milk (producing districts for WHO program)

(from April 1980 to Nov. 1980)

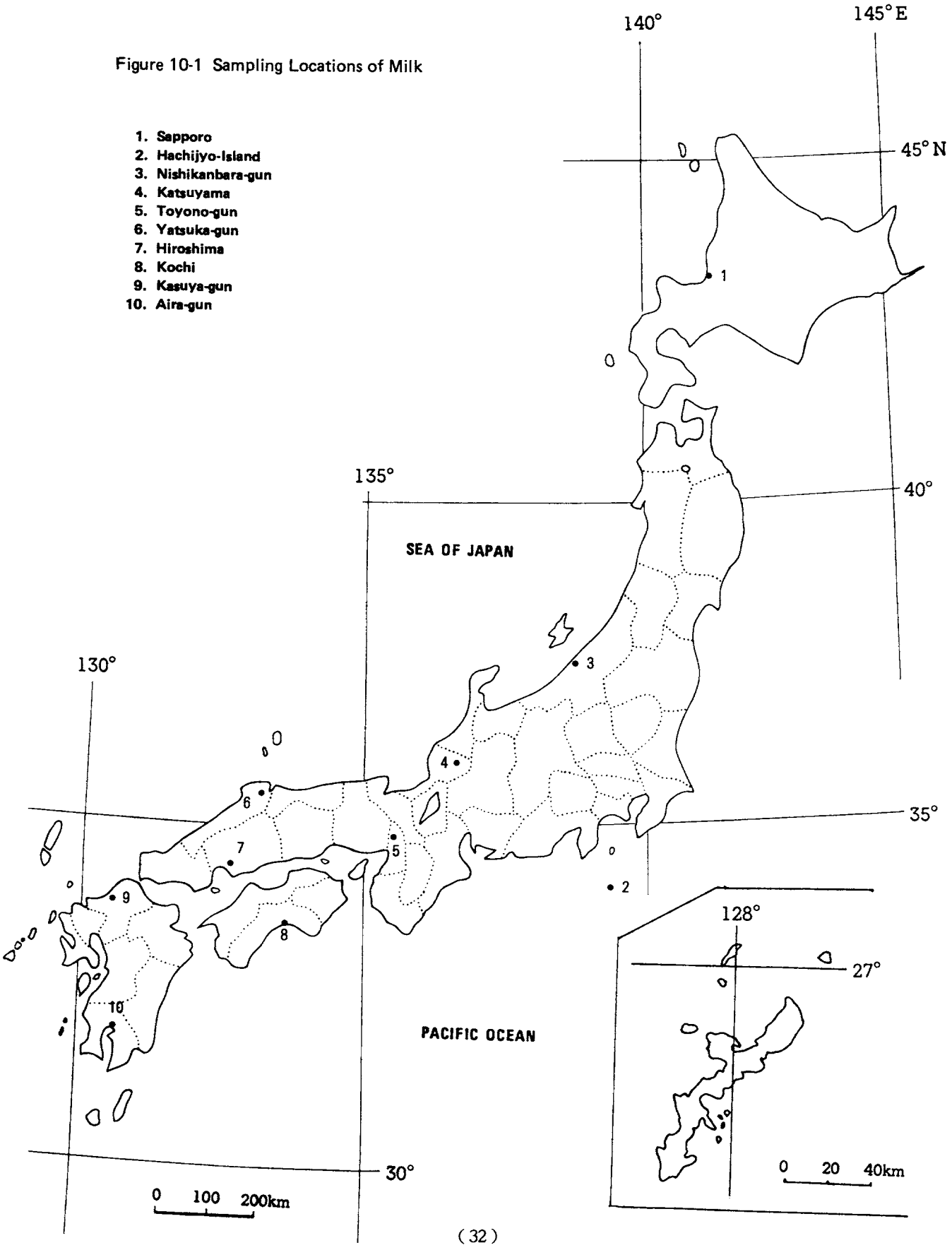
– continued from No. 53 of this publication –

Table 10-1: Strontium-90 and Sesium-137 in Milk

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	(g/p/d)	(mg/p/d)	(mg/p/d)	pCi/p/d	S.U.	pCi/p/d	C.U.
April, 1980							
Yatsuka-gun, SHIMANE	7.44	1.09	1.61	1.8 ± 0.27	1.6 ± 0.25	5.6 ± 0.34	3.5 ± 0.21
June, 1980							
Nishikanbara-gun, NIIGATA	7.82	1.22	1.65	2.7 ± 0.32	2.2 ± 0.26	6.0 ± 0.34	3.7 ± 0.21
Toyono-gun, OSAKA	7.42	1.12	1.56	0.8 ± 0.22	0.8 ± 0.20	1.6 ± 0.22	1.0 ± 0.14
Yatsuka-gun, SHIMANE	7.21	1.05	1.68	2.2 ± 0.29	2.1 ± 0.27	6.1 ± 0.33	3.6 ± 0.19
July, 1980							
Hiroshima, HIROSHIMA	6.65	1.02	1.47	1.8 ± 0.23	1.8 ± 0.23	2.3 ± 0.24	1.6 ± 0.16
August, 1980							
Hachijyo-Island, TOKYO	7.29	1.04	1.66	9.2 ± 0.48	8.8 ± 0.46	24 ± 0.6	14 ± 0.4
Nishikanbara-gun, NIIGATA	7.48	1.16	1.51	1.4 ± 0.25	1.2 ± 0.21	3.0 ± 0.29	2.0 ± 0.19
Katsuyama, FUKUI	7.23	1.05	1.64	3.6 ± 0.33	3.4 ± 0.31	3.2 ± 0.26	1.9 ± 0.16
Yatsuka-gun, SHIMANE	7.54	1.16	1.62	2.7 ± 0.31	2.3 ± 0.27	5.0 ± 0.33	3.1 ± 0.20
Kochi, KOCHI	7.17	0.885	1.49	1.2 ± 0.25	1.4 ± 0.28	1.0 ± 0.18	0.6 ± 0.12
Kasuya-gun, FUKUOKA	7.34	1.17	1.62	1.8 ± 0.27	1.6 ± 0.23	2.0 ± 0.24	1.3 ± 0.15
September, 1980							
Sapporo, HOKKAIDO	7.56	1.19	1.64	3.5 ± 0.35	2.9 ± 0.29	4.0 ± 0.30	2.4 ± 0.18
Aira-gun, KAGOSHIMA	6.41	0.983	1.39	1.8 ± 0.25	1.9 ± 0.26	3.5 ± 0.29	2.5 ± 0.21
November, 1980							
Hachijyo-Island, TOKYO	7.60	1.15	1.67	7.6 ± 0.46	6.7 ± 0.40	34 ± 0.8	21 ± 0.5
Nishikanbara-gun, NIIGATA	7.45	1.14	1.58	1.6 ± 0.30	1.4 ± 0.26	1.8 ± 0.24	1.1 ± 0.15
Kochi, KOCHI	7.46	1.11	1.66	1.9 ± 0.29	1.7 ± 0.26	1.7 ± 0.24	1.0 ± 0.14
Aira-gun, KAGOSHIMA	6.91	1.06	1.48	2.0 ± 0.27	1.9 ± 0.25	2.5 ± 0.26	1.7 ± 0.17

Figure 10-1 Sampling Locations of Milk

1. Sapporo
2. Hachijyo-Island
3. Nishikanbara-gun
4. Katsuyama
5. Toyono-gun
6. Yatsuka-gun
7. Hiroshima
8. Kochi
9. Kasuya-gun
10. Aira-gun



(10)-2 Strontium-90 and Cesium-137 in Milk (producing districts for domestic program)

(from June 1980 to Oct. 1980)

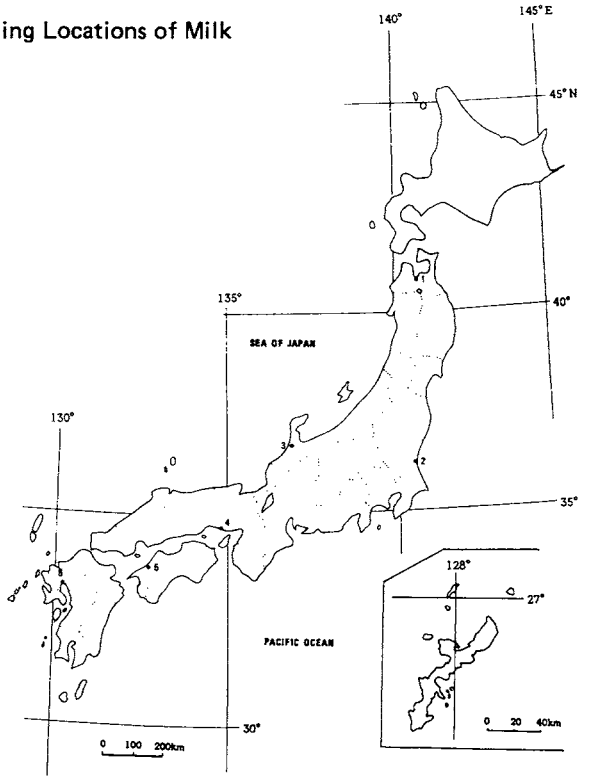
– continued from No. 53 of this publication –

Table 10-2: Strontium-90 and Cesium-137 in Milk

Location	Ash	Ca	K	^{90}Sr		^{134}Cs	
	(g/p/d)	(mg/p/d)	(mg/p/d)	pCi/p/d	S.U.	pCi/p/d	C.U.
June, 1980							
Saga-gun, SAGA	7.26	1.09	1.64	1.2 ± 0.25	1.1 ± 0.23	2.3 ± 0.25	1.4 ± 0.15
August, 1980							
Mito, IBATAGI	7.54	1.24	1.63	1.8 ± 0.27	1.4 ± 0.22	1.3 ± 0.22	0.8 ± 0.14
Himeji, HYOGO	6.76	1.13	1.54	2.8 ± 0.28	2.5 ± 0.25	1.3 ± 0.19	0.8 ± 0.13
Matsuyama, EHIME	7.27	1.12	1.52	2.0 ± 0.30	1.8 ± 0.27	1.2 ± 0.21	0.8 ± 0.14
September, 1980							
Aomori, AOMORI	7.03	1.11	1.61	12 ± 0.5	10 ± 0.5	5.6 ± 0.33	3.5 ± 0.20
Hakui-gun, ISHIKAWA	6.77	1.00	1.59	2.8 ± 0.29	2.8 ± 0.29	7.8 ± 0.36	4.9 ± 0.23
October, 1980							
Saga-gun, SAGA	7.24	1.11	1.56	1.1 ± 0.25	1.0 ± 0.20	1.0 ± 0.20	0.7 ± 0.13

Figure 10-2 Sampling Locations of Milk

1. **Aomori**
2. **Mito**
3. **Hakui-gun**
4. **Himeji**
5. **Matsuyama**
6. **Saga-gun**



(10)-3 Strontium-90 and Cesium-137 in Milk (consuming districts)

(from June 1980 to Oct. 1980)

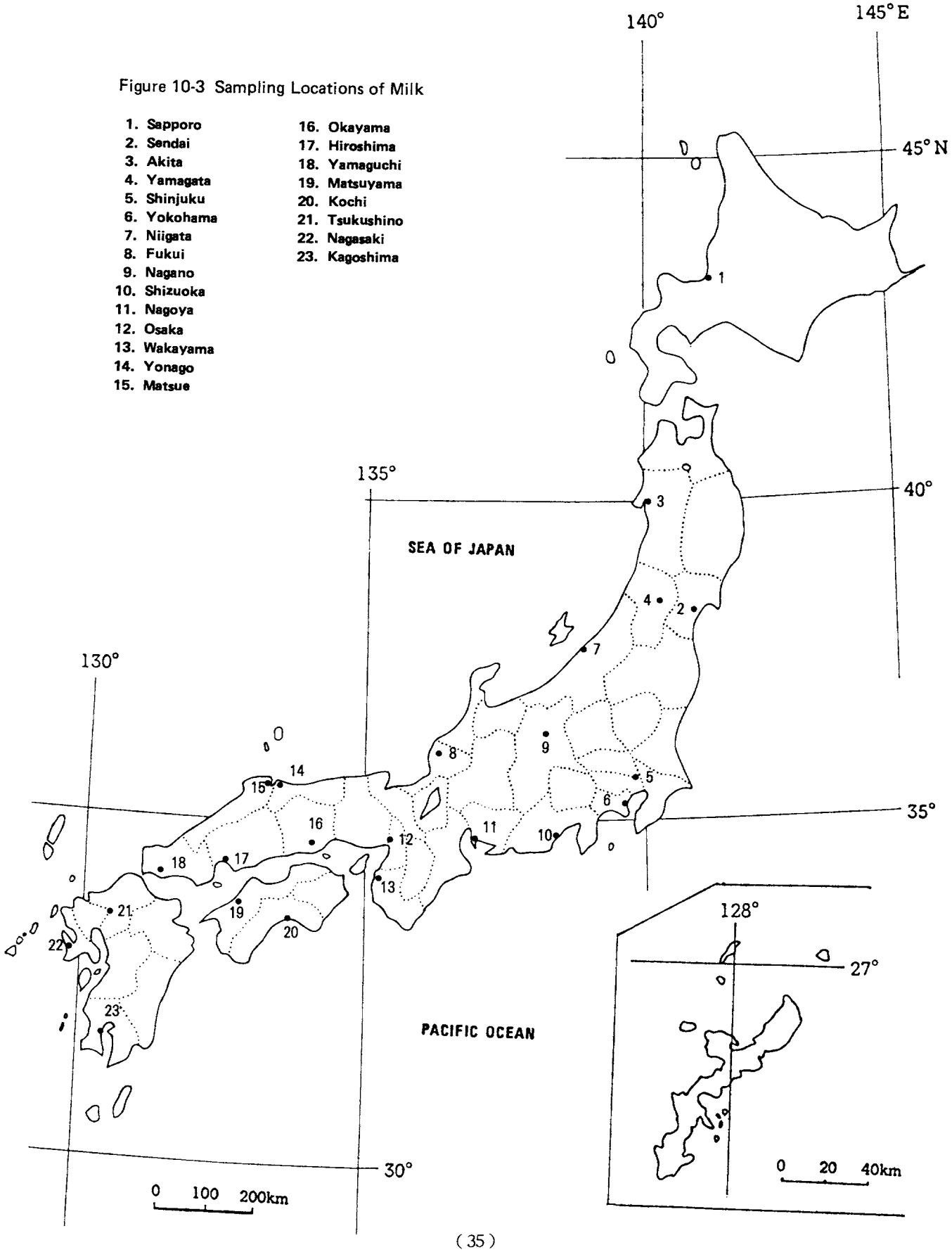
– continued from No. 53 of this publication –

Table 10-3: Strontium-90 and Cesium-137 in Milk

Location	Ash	Ca	K	^{90}Sr		^{137}Cs	
	(g/p/d)	(mg/p/d)	(mg/p/d)	pCi/p/d	S.U.	pCi/p/d	C.U.
June, 1980							
Osaka, OSAKA	7.21	1.09	1.58	1.8 ± 0.27	1.6 ± 0.24	1.3 ± 0.20	0.8 ± 0.13
Matsue, SHIMANE	7.08	1.8	1.55	2.1 ± 0.26	2.0 ± 0.25	2.3 ± 0.23	1.5 ± 0.15
August, 1980							
Sapporo, HOKKAIDO	7.27	1.12	1.55	2.2 ± 0.28	1.9 ± 0.25	7.2 ± 0.35	4.6 ± 0.22
Yamagata, YAMAGATA	6.72	1.00	1.53	1.5 ± 0.25	1.5 ± 0.25	2.3 ± 0.22	1.5 ± 0.14
Shinjuku, TOKYO	6.93	1.05	1.54	1.6 ± 0.24	1.5 ± 0.23	2.0 ± 0.21	1.3 ± 0.14
Yokohama, KANAGAWA	7.18	1.08	1.60	1.5 ± 0.25	1.4 ± 0.23	2.7 ± 0.26	1.7 ± 0.16
Niigata, NIIGATA	7.94	1.18	1.71	2.3 ± 0.30	2.0 ± 0.25	3.9 ± 0.34	2.3 ± 0.20
Nagano, NAGANO	6.89	1.04	1.52	1.4 ± 0.26	1.4 ± 0.25	1.9 ± 0.21	1.3 ± 0.14
Shizuoka, SHIZUOKA	7.04	1.07	1.54	1.3 ± 0.26	1.2 ± 0.24	1.7 ± 0.22	1.1 ± 0.14
Nagoya, AICHI	7.20	1.06	1.53	1.5 ± 0.23	1.5 ± 0.21	1.6 ± 0.23	1.1 ± 0.15
Wakayama, WAKAYAMA	5.80	0.886	1.25	1.3 ± 0.22	1.4 ± 0.24	1.0 ± 0.17	0.8 ± 0.13
Yonago, TOTTORI	7.30	1.11	1.47	2.7 ± 0.27	2.5 ± 0.25	8.2 ± 0.39	5.5 ± 0.26
Okayama, OKAYAMA	7.26	1.12	1.61	1.6 ± 0.24	1.4 ± 0.21	2.7 ± 0.25	1.7 ± 0.16
Yamaguchi, YAMAGUCHI	7.14	1.09	1.57	1.4 ± 0.23	1.3 ± 0.21	2.1 ± 0.27	1.3 ± 0.17
Matsuyama, EHIME	7.33	1.11	1.54	1.1 ± 0.24	1.0 ± 0.22	3.5 ± 0.29	2.2 ± 0.19
Kochi, KOCHI	6.91	1.03	1.54	3.0 ± 0.33	2.9 ± 0.32	3.0 ± 0.25	1.9 ± 0.16
Tsukushino, FUKUOKA	7.34	1.12	1.58	1.6 ± 0.24	1.4 ± 0.22	1.6 ± 0.24	1.0 ± 0.15
Nagasaki, NAGASAKI	6.99	1.04	1.51	1.9 ± 0.27	1.8 ± 0.26	1.7 ± 0.22	1.1 ± 0.14
September, 1980							
Sendai, MIYAGI	7.19	1.11	1.56	1.7 ± 0.28	1.5 ± 0.25	3.2 ± 0.27	2.1 ± 0.17
Akita, AKITA	4.78	0.725	0.976	2.3 ± 0.22	3.2 ± 0.31	2.6 ± 0.19	2.7 ± 0.20
Fukui, FUKUI	7.18	1.06	1.51	1.1 ± 0.23	1.0 ± 0.22	2.8 ± 0.25	1.8 ± 0.17
Hiroshima, HIROSHIMA	6.58	1.01	1.44	1.1 ± 0.21	1.1 ± 0.21	1.8 ± 0.22	1.2 ± 0.15
Kagoshima, KAGOSHIMA	6.91	1.05	1.55	1.7 ± 0.25	1.6 ± 0.24	6.5 ± 0.35	4.2 ± 0.22
October, 1980							
Kyoto, KYOTO	6.75	1.03	1.48	1.1 ± 0.25	1.0 ± 0.24	1.5 ± 0.21	1.0 ± 0.14

Figure 10-3 Sampling Locations of Milk

1. Sapporo
2. Sendai
3. Akita
4. Yamagata
5. Shinjuku
6. Yokohama
7. Niigata
8. Fukui
9. Nagano
10. Shizuoka
11. Nagoya
12. Osaka
13. Wakayama
14. Yonago
15. Matsue
16. Okayama
17. Hiroshima
18. Yamaguchi
19. Matsuyama
20. Kochi
21. Tsukushino
22. Nagasaki
23. Kagoshima



(10)-4 Strontium-90 and Cesium-137 in Milk (powdered milk)

Oct. 1980

– continued from No. 53 of this publication –

Table 10-4: Strontium-90 and Cesium-137 in Milk

Name of Manufacturer	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
October, 1980							
Morinaga	2.51	0.336	0.570	12 ± 0.6	3.6 ± 0.17	43 ± 0.9	7.5 ± 0.16
Yukijirushi	2.47	0.427	0.388	9.2 ± 0.49	2.1 ± 0.11	32 ± 0.8	8.3 ± 0.21
Meiji	2.60	0.452	0.497	14 ± 0.6	3.1 ± 0.14	36 ± 0.8	7.2 ± 0.17
Wakodo	2.44	0.344	0.586	5.7 ± 0.47	1.7 ± 0.14	20 ± 0.6	3.4 ± 0.11
*Meiji	8.32	1.38	1.82	34 ± 0.3	2.5 ± 0.10	77 ± 1.7	4.2 ± 0.10
*Morinaga	8.01	1.28	1.76	30 ± 1.2	2.3 ± 0.10	49 ± 1.3	2.8 ± 0.07

* Skim milk

(11)-1 Strontium-90 and Cesium-137 in Vegetables (producing districts)

(from May 1980 to Dec. 1980)

– continued from No. 53 of this publication –

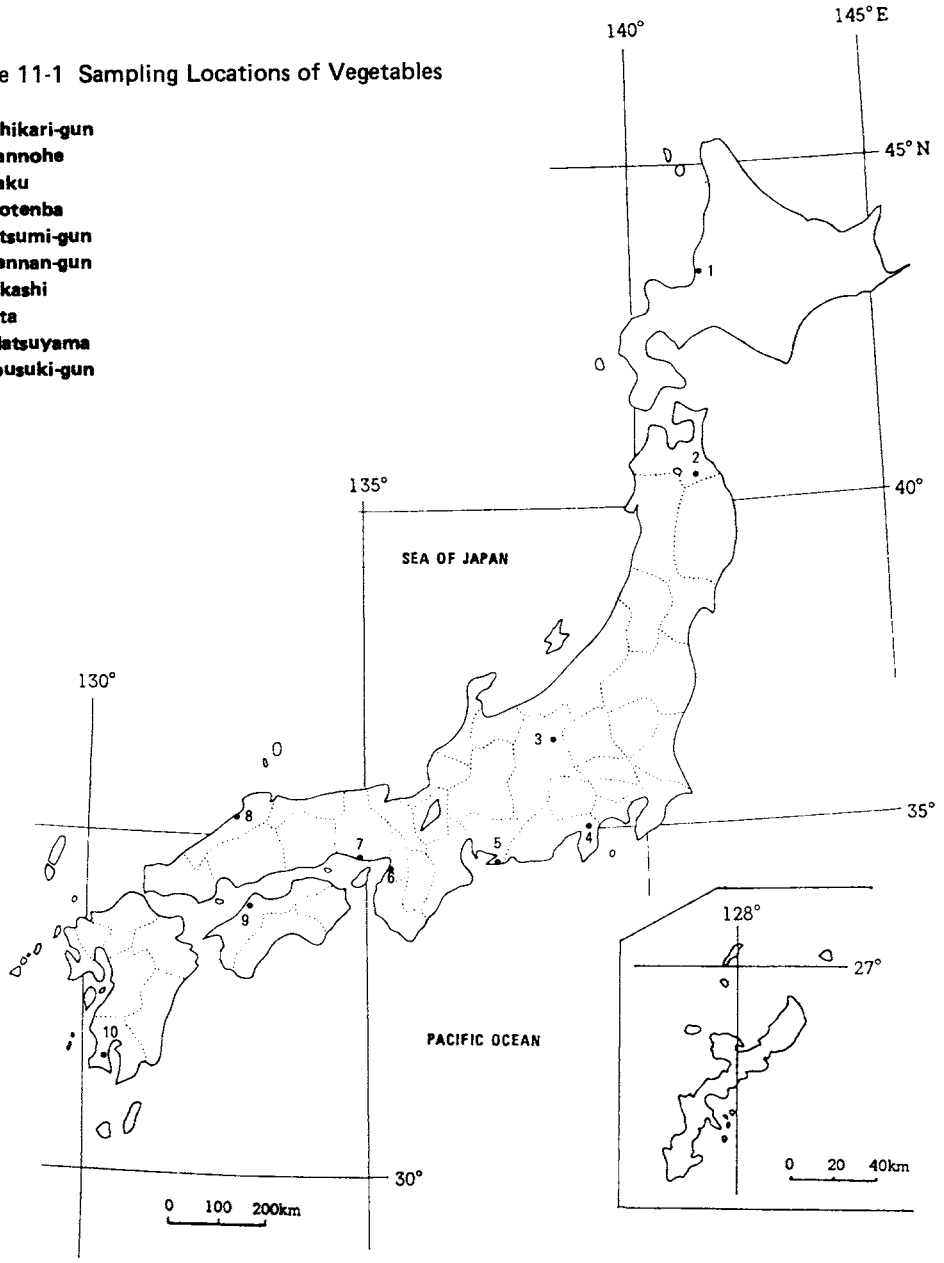
Table 11-1: Strontium-90 and Cesium-137 in Vegetables

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Japanese radish)							
May, 1980							
Atsumi-gun, AICHI	0.706	0.020	0.263	2.6 ± 0.30	13 ± 1.5	0.0 ± 0.17	0.0 ± 0.06
July, 1980							
Ota, SHIMANE	0.567	0.022	0.250	11 ± 0.7	50 ± 3.3	1.1 ± 0.32	0.4 ± 0.13
September, 1980							
Ishikari-gun, HOKKAIDO	0.483	0.024	0.175	22 ± 0.8	89 ± 3.5	0.7 ± 0.24	0.4 ± 0.14
October, 1980							
Saku, NAGANO	0.6677	0.046	0.282	5.6 ± 0.36	12 ± 0.8	0.4 ± 0.19	0.2 ± 0.07
November, 1980							
Sannohe, AOMORI	0.461	0.028	0.190	10 ± 0.5	37 ± 1.7	0.2 ± 0.15	0.1 ± 0.08
Gotenba, SHIZUOKA	0.592	0.022	0.274	7.3 ± 0.42	33 ± 1.9	2.0 ± 0.21	0.7 ± 0.08
Ibusuki-gun, KAGOSHIMA	0.589	0.032	0.253	11 ± 0.5	34 ± 1.5	4.3 ± 0.27	1.7 ± 0.10
December, 1980							
Akashi, HYOGO	0.535	0.025	0.218	6.9 ± 0.40	27 ± 1.6	0.3 ± 0.15	0.2 ± 0.07
(Spinach)							
May, 1980							
Atsumi-gun, AICHI	1.28	0.078	0.495	3.2 ± 0.48	4.1 ± 0.61	0.0 ± 0.35	0.0 ± 0.07
July, 1980							
Ota, SHIMANE	1.03	0.035	0.436	6.9 ± 0.56	20 ± 1.6	2.0 ± 0.30	0.5 ± 0.07
September, 1980							
Ishikari-gun, HOKKAIDO	1.73	0.051	0.834	11 ± 0.6	21 ± 1.1	0.6 ± 0.25	0.1 ± 0.03
October, 1980							
Saku, NAGANO	1.61	0.087	0.561	8.8 ± 0.49	10 ± 0.6	1.6 ± 0.28	0.3 ± 0.05
November, 1980							
Gotenba, SHIZUOKA	1.32	0.127	0.378	5.1 ± 0.74	4.0 ± 0.58	35 ± 1.1	9.3 ± 0.23
Matsuyama, EHIME	1.66	0.087	0.683	9.4 ± 0.86	11 ± 1.0	0.7 ± 0.42	0.1 ± 0.06
Ibusuki, KAGOSHIMA	1.41	0.082	0.440	2.5 ± 0.53	3.1 ± 0.65	29 ± 1.0	6.6 ± 0.22
December, 1980							
Akashi, HYOGO	1.72	0.160	0.583	11 ± 0.9	7.0 ± 0.56	1.6 ± 0.42	0.3 ± 0.07

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Cabbage)							
November, 1980							
Sannohe, AOMORI	0.611	0.039	0.260	11 ± 0.5	29 ± 1.3	1.1 ± 0.18	0.4 ± 0.07
(Onion)							
May, 1980							
Sennan-gun, OSAKA	0.283	0.015	0.109	2.2 ± 0.25	15 ± 1.6	0.2 ± 0.16	0.2 ± 0.15

Figure 11-1 Sampling Locations of Vegetables

1. Ishikari-gun
2. Sannohe
3. Saku
4. Gotenba
5. Atsumi-gun
6. Sennan-gun
7. Akashi
8. Ota
9. Matsuyama
10. Ibusuki-gun



(11)-2 Strontium-90 and Cesium-137 in Vegetables (consuming districts)

(from April 1980 to Nov. 1980)

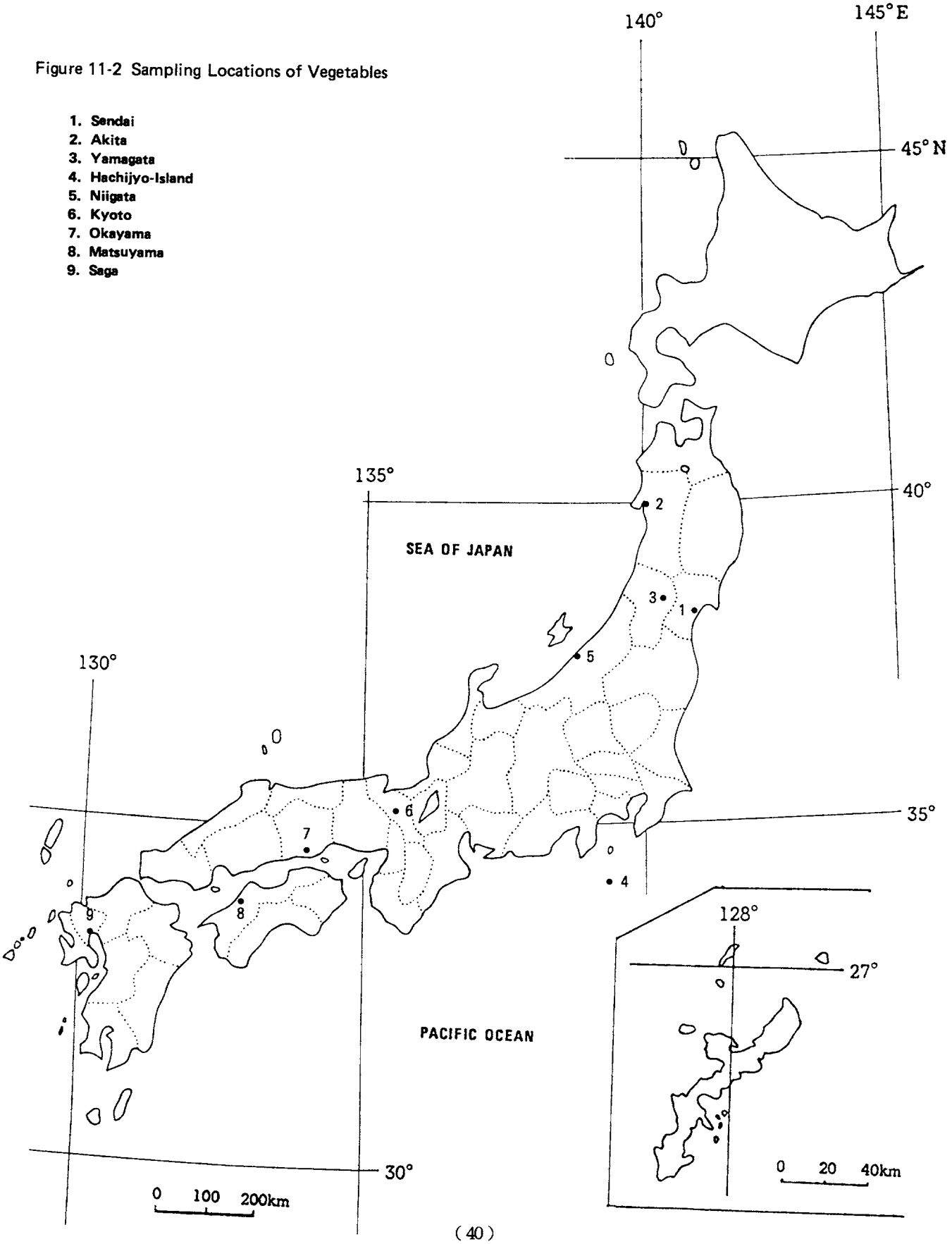
– continued from No. 53 of this publication –

Table 11-2: Strontium-90 and Cesium-137 in Vegetables

Location	Component			^{90}Sr		^{137}Cs	
	Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
(Japanese radish)							
September, 1980							
Akita, AKITA	0.563	0.018	0.249	16 ± 0.5	87 ± 3.0	0.3 ± 0.15	0.1 ± 0.06
October, 1980							
Kyoto, KYOTO	0.628	0.028	0.282	13 ± 0.6	48 ± 2.1	0.0 ± 0.16	0.0 ± 0.06
November, 1980							
Yamagata, YAMAGATA	0.452	0.021	0.186	5.6 ± 0.46	27 ± 2.2	0.4 ± 0.22	0.2 ± 0.12
Hachijyo-Island, TOKYO	0.522	0.035	0.207	2.1 ± 0.23	5.9 ± 0.66	0.7 ± 0.14	0.4 ± 0.07
Niigata, NIIGATA	0.411	0.025	0.151	4.0 ± 0.37	16 ± 1.5	4.0 ± 0.30	2.6 ± 0.20
Okayama, OKAYAMA	0.417	0.028	0.167	48 ± 1.3	170 ± 5	1.5 ± 0.25	0.9 ± 0.15
Saga, SAGA	0.699	0.024	0.318	4.5 ± 0.36	19 ± 1.5	0.4 ± 0.18	0.1 ± 0.06
(Spinach)							
April, 1980							
Sendai, MIYAGI	1.23	0.052	0.491	12 ± 0.7	23 ± 1.4	0.5 ± 0.31	0.1 ± 0.06
June, 1980							
Niigata, NIIGATA	1.57	0.132	0.424	11 ± 0.6	8.2 ± 0.42	2.6 ± 0.30	0.6 ± 0.07
November, 1980							
Yamagata, YAMAGATA	1.24	0.048	0.570	14 ± 0.5	29 ± 1.1	0.7 ± 0.19	0.1 ± 0.03
Okayama, OKAYAMA	1.35	0.086	0.566	3.1 ± 0.58	3.6 ± 0.67	0.5 ± 0.34	0.1 ± 0.06
Matsuyama, EHIME	1.74	0.077	0.758	2.2 ± 0.64	2.8 ± 0.83	2.4 ± 0.51	0.3 ± 0.07
Saga, SAGA	1.75	0.072	0.763	1.3 ± 0.57	1.8 ± 0.79	1.2 ± 0.46	0.2 ± 0.06
(Cabbage)							
October, 1980							
Akita, AKITA	0.445	0.033	0.169	6.7 ± 0.32	20 ± 1.0	0.4 ± 0.12	0.2 ± 0.07

Figure 11-2 Sampling Locations of Vegetables

1. Sendai
2. Akita
3. Yamagata
4. Hachijyo-Island
5. Niigata
6. Kyoto
7. Okayama
8. Matsuyama
9. Saga



(12) Strontium-90 and Cesium-137 in Sea fish

(from Jan. 1980 to Dec. 1980)

– continued from No. 53 of this publication –

Table 12: Strontium-90 and Cesium-137 in Sea fish

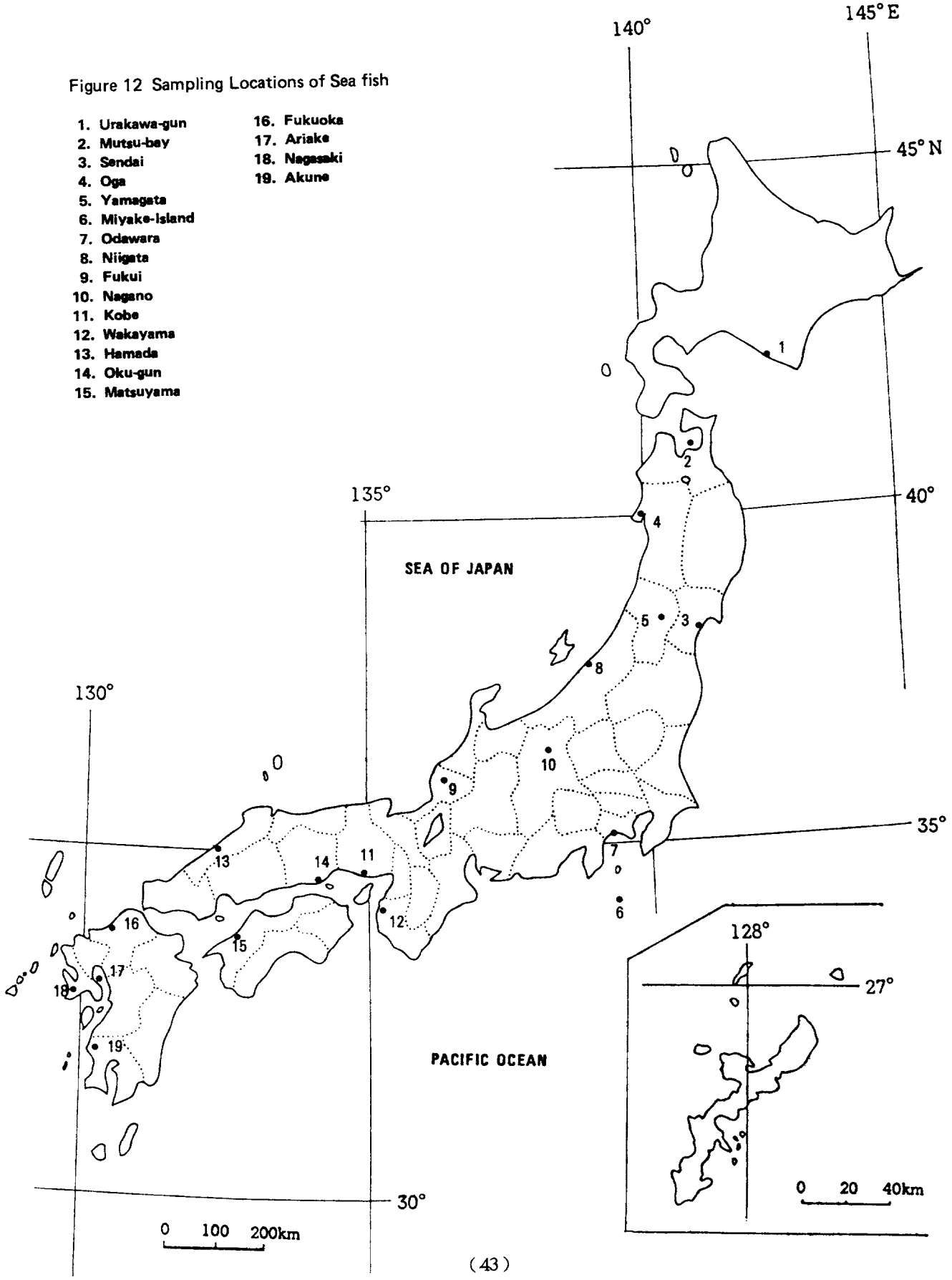
Location	Sampling Date	Component			^{90}Sr		^{137}Cs	
		Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
Oncorhynchus keta								
Urakawa-gun, HOKKAIDO	Oct. 1980	1.38	5.41	31.1	0.0 ± 0.21	0.0 ± 0.27	8.6 ± 0.40	2.0 ± 0.09
Pleuronectidae								
Sendai, MIYAGI	Jun. 1980	2.72	22.5	14.1	0.3 ± 0.22	0.06 ± 0.04	3.4 ± 0.33	0.9 ± 0.09
Mutsu-bay, AOMORI	Nov. 1980	1.52	9.24	24.7	0.0 ± 0.23	0.0 ± 0.16	5.6 ± 0.41	1.4 ± 0.11
Niigata, NIIGATA	Nov. 1980	0.935	5.97	27.4	0.1 ± 0.24	0.2 ± 0.43	4.3 ± 0.36	1.7 ± 0.14
Fukui, FUKUI	Nov. 1980	1.02	3.92	30.0	0.0 ± 0.37	0.0 ± 0.92	4.9 ± 0.49	1.6 ± 0.16
Arctoscopus japonicus								
Oga, AKITA	Dec. 1980	2.25	21.4	13.2	1.1 ± 0.31	0.2 ± 0.06	3.7 ± 0.39	1.3 ± 0.13
Doryteuthis bleekeri								
Yamagata, YAMAGATA	Oct. 1980	1.27	0.429	21.7	0.0 ± 0.23	0.0 ± 3.85	2.1 ± 0.29	0.7 ± 0.09
Decapterus								
Miyake-Island, TOKYO	Sep. 1980	0.733	8.79	22.2	0.2 ± 0.21	0.3 ± 0.33	3.4 ± 0.29	2.1 ± 0.18
Trachurus trachurus								
Kobe, HYOGO	Aug. 1980	2.77	23.6	14.7	0.2 ± 0.25	0.02 ± 0.04	10 ± 0.5	2.5 ± 0.12
Wakayama, WAKAYAMA	Oct. 1980	2.64	24.6	99.81	0.4 ± 0.31	0.1 ± 0.05	5.6 ± 0.43	2.1 ± 0.16
Odawara, KANAGAWA	Dec. 1980	3.72	23.2	9.55	0.8 ± 0.31	0.1 ± 0.03	6.3 ± 0.41	1.7 ± 0.11
Sardinops melanosticta								
Nagano, NAGANO	Dec. 1980	2.92	24.3	11.4	1.1 ± 0.27	0.2 ± 0.04	4.7 ± 0.38	1.4 ± 0.11
Sebastiscus marmoratus								
Hamada, SHIMANE	Aug. 1980	5.88	27.2	4.81	1.6 ± 0.41	0.1 ± 0.02	6.5 ± 0.52	2.1 ± 0.17
Mugil cephalus								
Ariake, SAGA	Aug. 1980	1.56	15.4	21.5	0.3 ± 0.23	0.1 ± 0.09	3.5 ± 0.31	1.0 ± 0.09
Oku-gun, OKAYAMA	Nov. 1980	1.33	4.31	25.0	0.6 ± 0.24	0.8 ± 0.32	4.8 ± 0.35	1.1 ± 0.08
Pneumatophorus japonicus								
Matsuyama, EHIME	Aug. 1980	1.13	2.69	35.4	0.5 ± 0.32	1.4 ± 0.98	7.4 ± 0.50	1.7 ± 0.12
Chrysophrys major								
Fukuoka, FUKUOKA	Jul. 1980	1.43	4.70	31.7	0.0 ± 0.18	0.0 ± 0.26	7.0 ± 0.37	1.5 ± 0.08

Location	Sampling Date	Component			^{90}Sr		^{137}Cs	
		Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
Argyrosomus argentatus								
Nagasaki, NAGASAKI	Aug. 1980	1.25	6.33	32.4	0.03 ± 0.29	0.04 ± 0.37	9.0 ± 0.56	2.2 ± 0.14
Stolephorus japonicus								
Akune, KAGOSHIMA	Dec. 1980	2.77	20.8	11.9	0.4 ± 0.23	0.1 ± 0.04	7.6 ± 0.43	2.2 ± 0.13

Scientific name	English name	Japanese name
Oncorhynchus keta	Salmon	Sake
Pleuronectidae	Flatfish	Karei
Arctoscopus japonicus	Hatahata	Hatahata
Doryteuthis bleekeri	A squid	Yariika
Decapterus	House-mackerel	Muroaji
Trachurus trachurus	Saurel	Aji
Sardinops melanosticta	Sardine	Iwashi
Sebastiscus marmoratus	Scorpion-fish	Kasago
Mugil cephalus	Gray mullet	Bora
Pneumatophorus japonicus	Mackerel	Saba
Chrysophrys major	Sea bream	Tai
Argyrosomus argentatus	Croaker	Guchi (Ishimochi)
Stolephorus japonicus	Kibinago	Kibinago

Figure 12 Sampling Locations of Sea fish

1. Urakawa-gun
2. Mutsu-bay
3. Sendai
4. Oga
5. Yamagata
6. Miyake-Island
7. Odawara
8. Niigata
9. Fukui
10. Nagano
11. Kobe
12. Wakayama
13. Hamada
14. Oku-gun
15. Matsuyama
16. Fukuoka
17. Ariake
18. Nagasaki
19. Akune



(13) Strontium-90 and Cesium-137 in Freshwater fish

(from Dec. 1979 to Dec. 1980)

– continued from No. 53 of this publication –

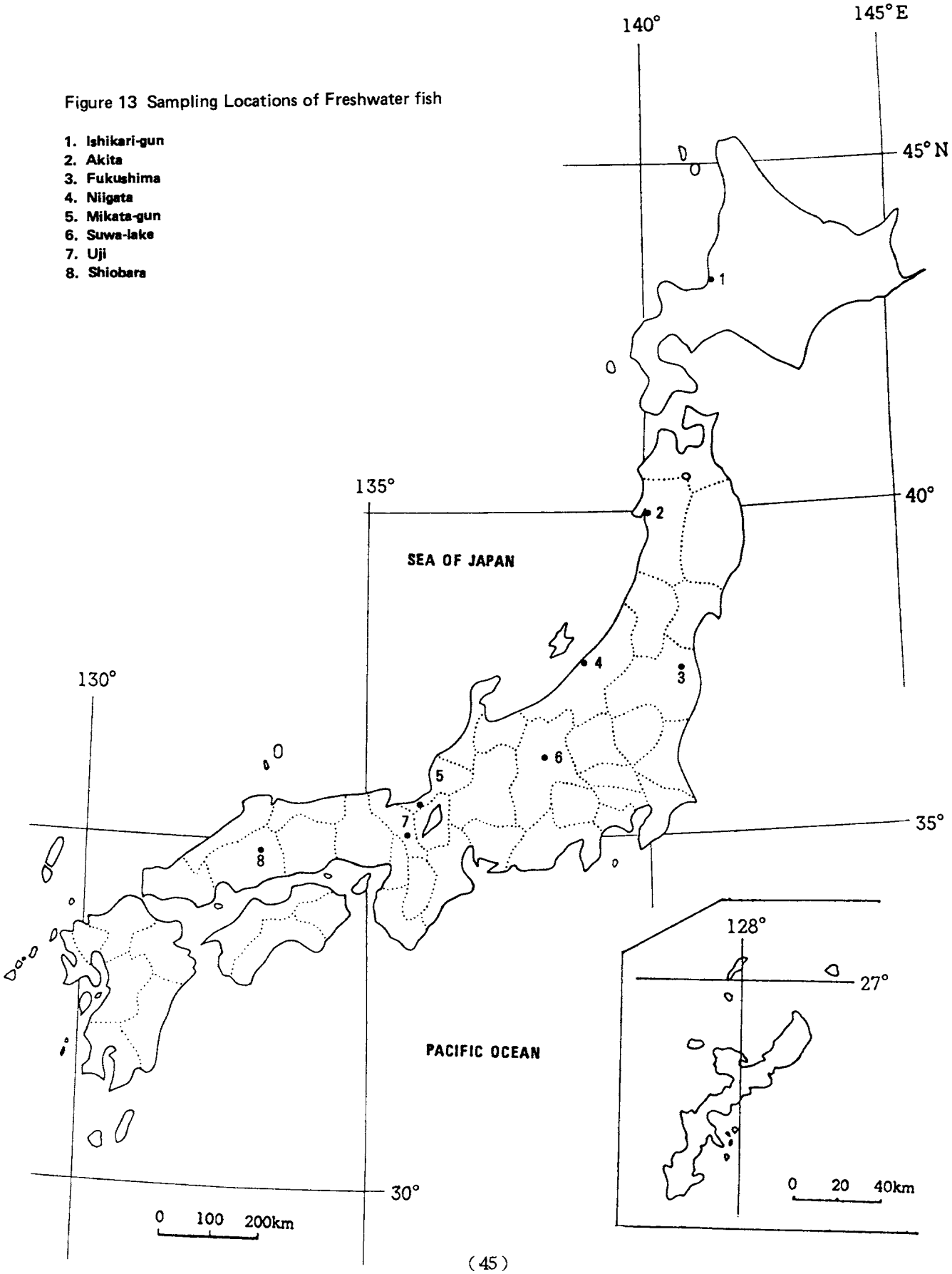
Table 13: Strontium-90 and Cesium-137 in Freshwater fish

Sampling Location	Date	Ash (%)	Component (% by weight)		^{90}Sr (pCi/ℓ)		^{137}Cs (pCi/ℓ)	
			Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
Carassius auratus								
Uji, KYOTO	Dec. 1979	4.70	27.0	6.06	59 ± 1.8	4.1 ± 0.12	2.7 ± 0.39	0.8 ± 0.12
Ishikari-gun, HOKKAIDO	Jul. 1980	3.91	29.8	7.13	38 ± 1.2	3.2 ± 0.11	5.0 ± 0.40	1.8 ± 0.14
Niigata, NIIGATA	Nov. 1980	1.27	28.0	11.1	29 ± 0.9	8.0 ± 0.25	5.0 ± 0.36	3.5 ± 0.25
Mikata-gun, FUKUI	Nov. 1980	1.04	2.87	20.7	2.1 ± 0.54	4.5 ± 1.2	9.6 ± 0.70	2.8 ± 0.21
Uji, KYOTO	Dec. 1980	4.79	31.0	6.40	63 ± 1.3	4.2 ± 0.09	3.3 ± 0.35	1.1 ± 0.11
Cyprinus carpio								
Akita, AKITA	Jul. 1980	3.11	29.5	7.18	170 ± 2	18 ± 0.2	7.7 ± 0.49	3.4 ± 0.22
Fukushima, FUKUSHIMA	Oct. 1980	2.97	25.7	9.67	36 ± 1.0	4.5 ± 0.13	10 ± 0.5	3.4 ± 0.17
Shobara, HIROSHIMA	Dec. 1980	2.17	23.9	12.6	30 ± 0.9	5.8 ± 0.17	7.8 ± 0.42	2.8 ± 0.15
Hypomesus olidus								
Suwa-lake, NAGANO	Dec. 1980	2.16	21.9	10.8	6.1 ± 0.44	1.2 ± 0.08	5.1 ± 0.38	2.0 ± 0.15

Scientific name	English name	Japanese name
Carassius auratus	A crucian carp	Funa
Cyprinus carpio	Carp	Koi
Hypomesus olidus	Pond-smelt	Wakasagi

Figure 13 Sampling Locations of Freshwater fish

1. Ishikari-gun
2. Akita
3. Fukushima
4. Niigata
5. Mikata-gun
6. Suwa-lake
7. Uji
8. Shiobara



(14) Strontium-90 and Cesium-137 in Shellfish

(from Jul. 1980 to Nov. 1980)

– continued from No. 53 of this publication –

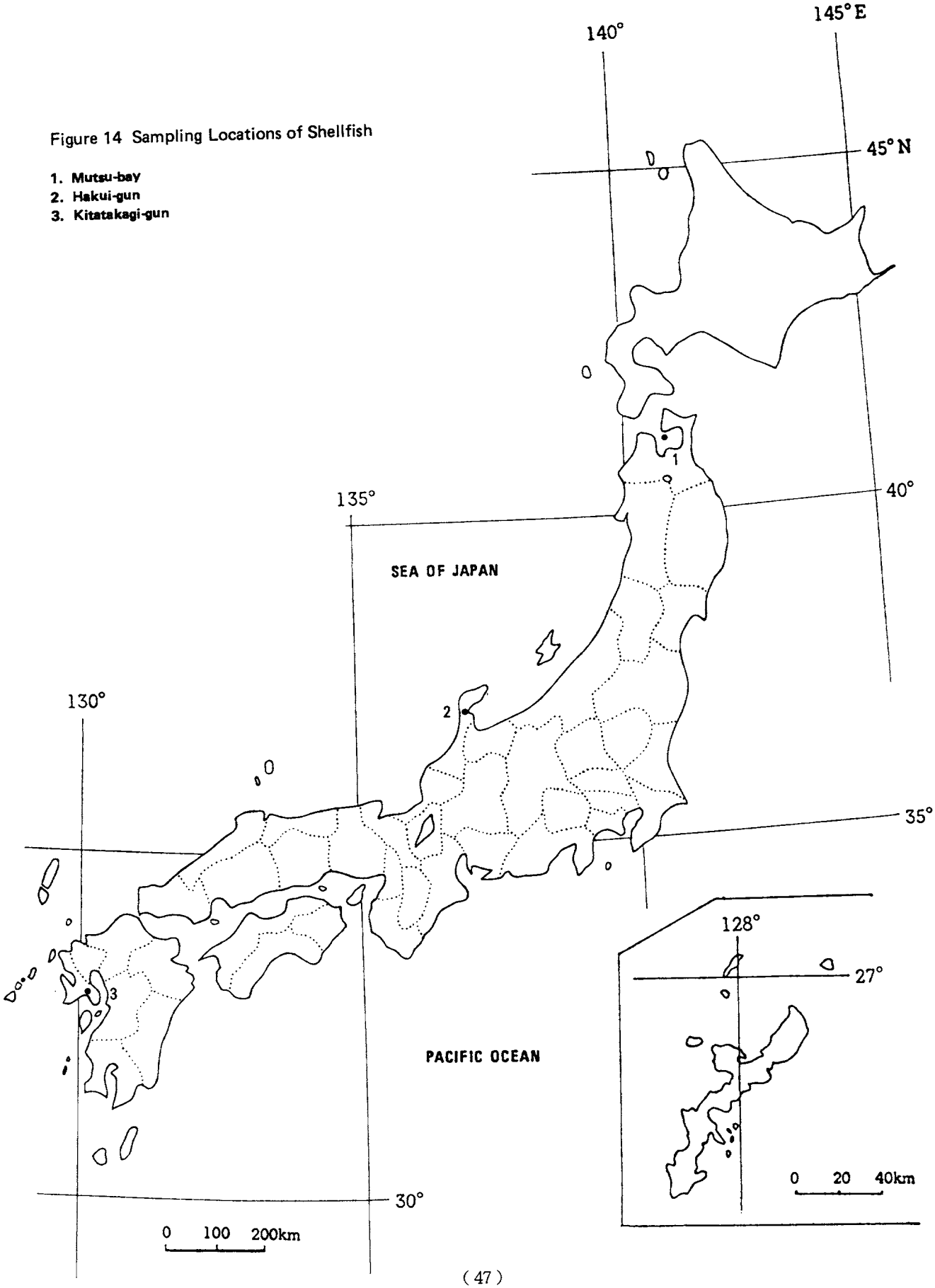
Table 14: Strontium-90 and Cesium-137 in Shellfish

Location	Sampling Date	Component			^{90}Sr		^{137}Cs	
		Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
Pecten yessoensis								
Mutsu-bay, AOMORI	Nov. 1980	1.25	2.41	16.0	0.3 ± 0.54	1.1 ± 1.78	1.5 ± 0.53	0.8 ± 0.26
Turbo cornutus								
Hakui-gun, ISHIKAWA	Jul. 1980	3.15	6.16	8.15	0.0 ± 0.51	0.0 ± 0.26	3.8 ± 0.50	1.5 ± 0.19
Vonerupis phillippinarum								
Kitatakagi-gun, NAGASAKI	Jul. 1980	2.17	6.15	8.15	0.0 ± 0.51	0.0 ± 0.38	0.7 ± 0.51	0.4 ± 0.29

Scientific name	English name	Japanese name
Pecten yessoensis	Scallop	Hotategai
Turbo cornutus	Wreath shell	Sazae
Venerupis phillippinarum	Short-necked clam	Asari

Figure 14 Sampling Locations of Shellfish

1. Mutsu-bay
2. Hakui-gun
3. Kitatakagi-gun



(15) Strontium-90 and Cesium-137 in Seaweeds

(from Apr. 1980 to Jan. 1981)

– continued from No. 53 of this publication –

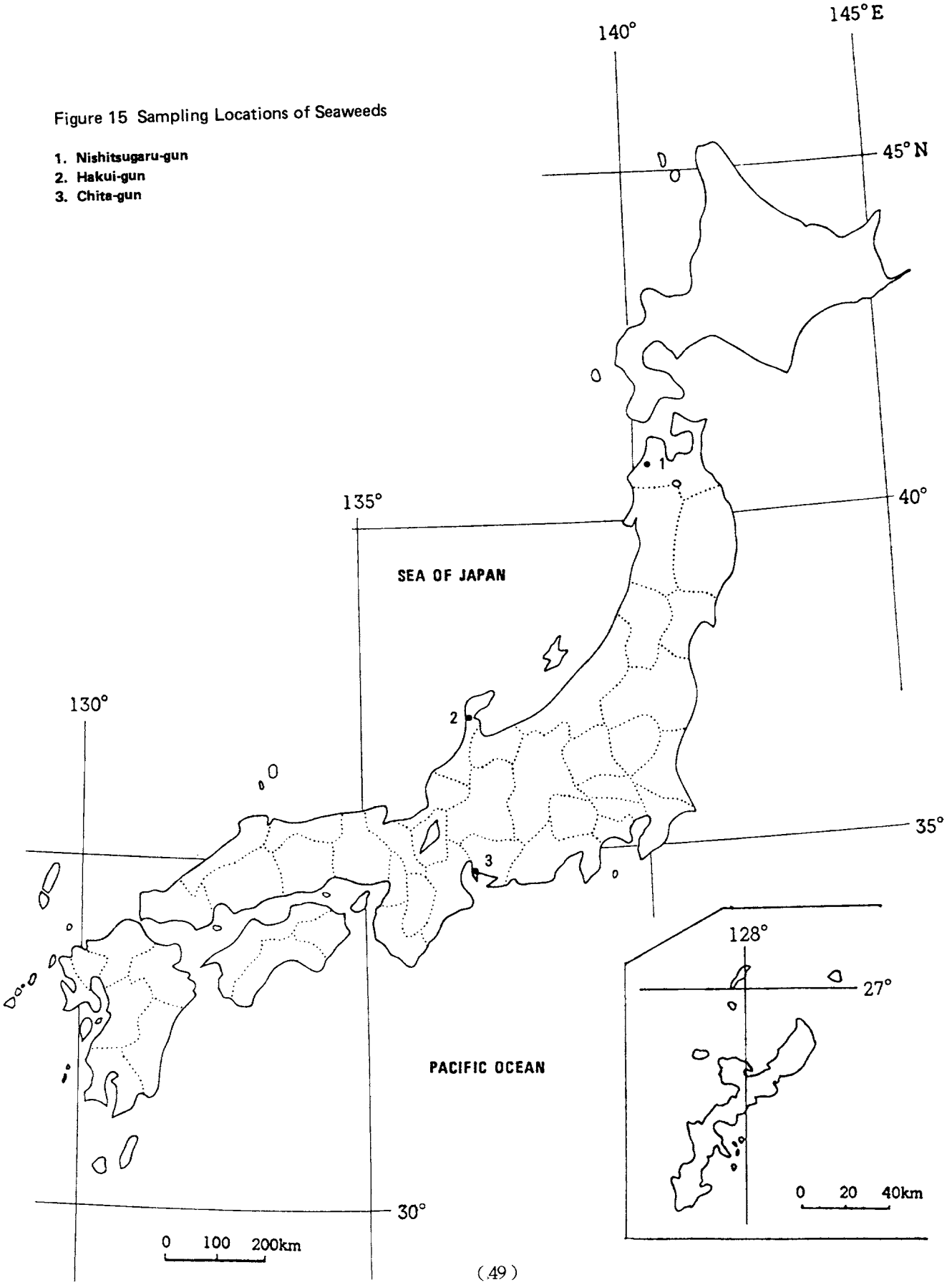
Table 15: Strontium-90 and Cesium-137 in Seaweeds

Location	Sampling Date	Component			^{90}Sr		^{137}Cs	
		Ash (%)	Ca (%)	K (%)	pCi/kg	S.U.	pCi/kg	C.U.
Sargassum fulvellum								
Nishitsugaru-gun, AOMORI	Nov. 1980	3.23	16.2	14.0	4.9 ± 0.43	0.9 ± 0.08	1.4 ± 0.29	0.3 ± 0.06
Undaria pinnatifida								
Hakui-gun, ISHIKAWA	Apr. 1980	2.03	3.78	23.0	1.4 ± 0.32	1.8 ± 0.42	1.3 ± 0.27	0.3 ± 0.06
Chita-gun, AICHI	Jan. 1981	1.42	2.62	23.2	0.6 ± 0.28	1.7 ± 0.75	0.7 ± 0.23	0.2 ± 0.07

Scientific name	English name	Japanese name
Sargassum fulvellum	Gulfweed	Hodawara
Undaria pinnatifida	Wakame seaweed	Wakame

Figure 15 Sampling Locations of Seaweeds

1. Nishitsugaru-gun
2. Hakui-gun
3. Chita-gun



Editted by National Institute of Radiological Sciences, under the supervision of Science and Technology Agency of Japanese Government.