

# Future Plan of Sea Area Monitoring

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Ministry of Education, Culture, Sports, Science and Technology

Fisheries Agency

Japan Coast Guard

Japan Meteorological Agency

Ministry of the Environment

Fukushima Prefecture

Tokyo Electric Power Company, Inc.

## Basic Idea for the Revision

In response to the expansion of the target of sea area monitoring dated May 6, prompt and frequently monitoring which focused primarily on safety screening has been conducted for sea water, marine soil, and marine products, offshore of Miyagi, Fukushima, and Ibaraki prefectures, with the help of related ministries, agencies, and organizations.

At present, radiation levels of sea water have continued to be below the minimum limit of detection at many points, while those of marine soil vary widely and a wide spread of contamination has been observed. The designation of emergency evacuation preparation areas was removed on September 30.

In consideration of these circumstances, the plan of sea area monitoring up to the end of this fiscal year shall be revised as follows:

- In order to confirm the long-term influences scientifically, the minimum limit of detection for sea water shall be reduced flexibly according to sea area, and the target sea area shall be expanded.
- With regard to marine soil, number of monitoring spots shall be increased so as to ascertain the deposition of radioactive substances more widely.
- Additions of target nuclides (Mn, Co, Ce, U, Am, and Cm) for analysis and analysis spot, in order to detect any leaks of radioactive substances deriving from the fuels of TEPCO's Fukushima Dai-ichi NPP or radioactive substances generated from the part of activated structural materials in the reactor.
- At some of the analysis points in front and coastal sea areas, where TEPCO conducts analysis, MEXT shall also conduct analysis of sea water and marine soil so as to verify analysis results.
- Regarding marine products, to confirm further safety, monitoring shall also be conducted in the sea areas within 20-30 km from the NPP, which had been designated as emergency

evacuation preparation areas.

The results of the monitoring of sea water and marine soil are shown by dividing target areas categorized as following four sea areas (see Attachments 1 and 2).

- (i) Front sea area: Sea area within a 30 km radius from the Fukushima Dai-ichi NPP
- (ii) Coastal area: Sea area within around 30 km from the coastline of Miyagi, Fukushima, Ibaraki, and part of Iwate prefectures
- (iii) Off-shore area: Sea area within around 30 to 90 km from the coastline
- (iv) Outer sea area: Around 90 to 280 km from the coastline and outside thereof

## **1. Sea water monitoring**

### **(1) Number of monitoring points**

Monitoring is to be conducted at a larger number of points than before (165 points).

As the sample collection schedule is now being adjusted among related ministries, agencies, organizations and volunteers, the final number has yet to be determined.

### **(2) Frequency**

- (i) Front sea area: Around once a day to once in two weeks
- (ii) Coastal area: Around once a week to once a month\*
- (iii) Off-shore area: Around once in two months\*
- (iv) Outer sea area: Around once in three months or as needed\*

\* At some points, monitoring will be conducted only once.

### **(3) Target for minimum limits of detection (Cs-134 and Cs-137)**

0.001 (off-shore and outer sea areas) to 2 Bq/L (front sea area)

(Reference: detection limits adopted so far: 5 to 24 Bq/L)

### **(4) Nuclides to be analyzed**

Cs-134 and Cs-137, which were analyzed for samples collected at all the monitoring points, will be analyzed continuously.

I-131, Sr-89, Sr-90, Pu-238, Pu-239 + 240, Total  $\alpha$ , Total  $\beta$ , and H-3, which were analyzed for samples collected at some of the monitoring points, will also be analyzed continuously.

The analysis of Mn-54, Co-60, and Ce-144 will be added for some monitoring points. If Pu-238 is detected, U-234, U-235, U-238, Am-241, Cm-242, and Cm-243 + 244 will also be analyzed at the relevant point.

## **2. Marine soil monitoring**

### **(1) Number of monitoring points**

Around 87 points (previous monitoring has been conducted at 62 points)

As the sample collection schedule is now being adjusted among related ministries, agencies, and organizations the final number has yet to be determined.

(2) Frequency

- (i) Front sea area: Around once a month
- (ii) Coastal area: Around once a month (at some points, monitoring will be conducted only once)
- (iii) Off-shore area: Around once in two months

(3) Target for minimum limits of detection (Cs-134 and Cs-137)

0.8 (off-shore area) to 10 Bq/L (front sea area)

(Reference: detection limits adopted so far: 0.8 to 10 Bq/L)

(4) Nuclides to be analyzed

Cs-134 and Cs-137, which were analyzed for samples collected at all the monitoring points, will be analyzed continuously.

I-131, Sr-89, Sr-90, Pu-238, Pu-239 + 240, U-234, U-235, U-238, Am-241, Cm-242, and Cm-243 + 244, which were analyzed for samples collected at some of the monitoring points, will also be analyzed continuously, and monitoring points will be increased for Sr-89, Sr-90, Pu-238, Pu-239 + 240, Cm-242, and Cm-243 + 244.

### **3. Marine product monitoring**

(1) Monitoring points and frequency

With regard to types of fish that live or run in the coastal, off-shore, or outer sea areas in eastern Japan, including in the off-shore area near the Fukushima Dai-ichi NPP, monitoring will be conducted once a week in principle, according to the catch landing in each prefecture during the period from September 2011 to March 2012.

As the designation of emergency evacuation preparation areas was removed on September 30, the area within 20 to 30 km from the NPP will also be added as the target area.

(2) Target of fish types

Littoral fish (sea bass, flounder, flatfish, etc.) and wide-area migratory fish (bonito, saury, mackerel, salmon, etc.). Fish samples will be collected mainly in sea areas in eastern Japan using survey ships or through purchasing landed marine products, and radioactive substances contained therein will be surveyed.

(3) Nuclides to be analyzed

Cs-134, Cs-137, and I-131 (Sr-89 and Sr-90 will be analyzed as needed)

### **4. Entities for conducting sea area monitoring**

(1) Entities for conducting monitoring

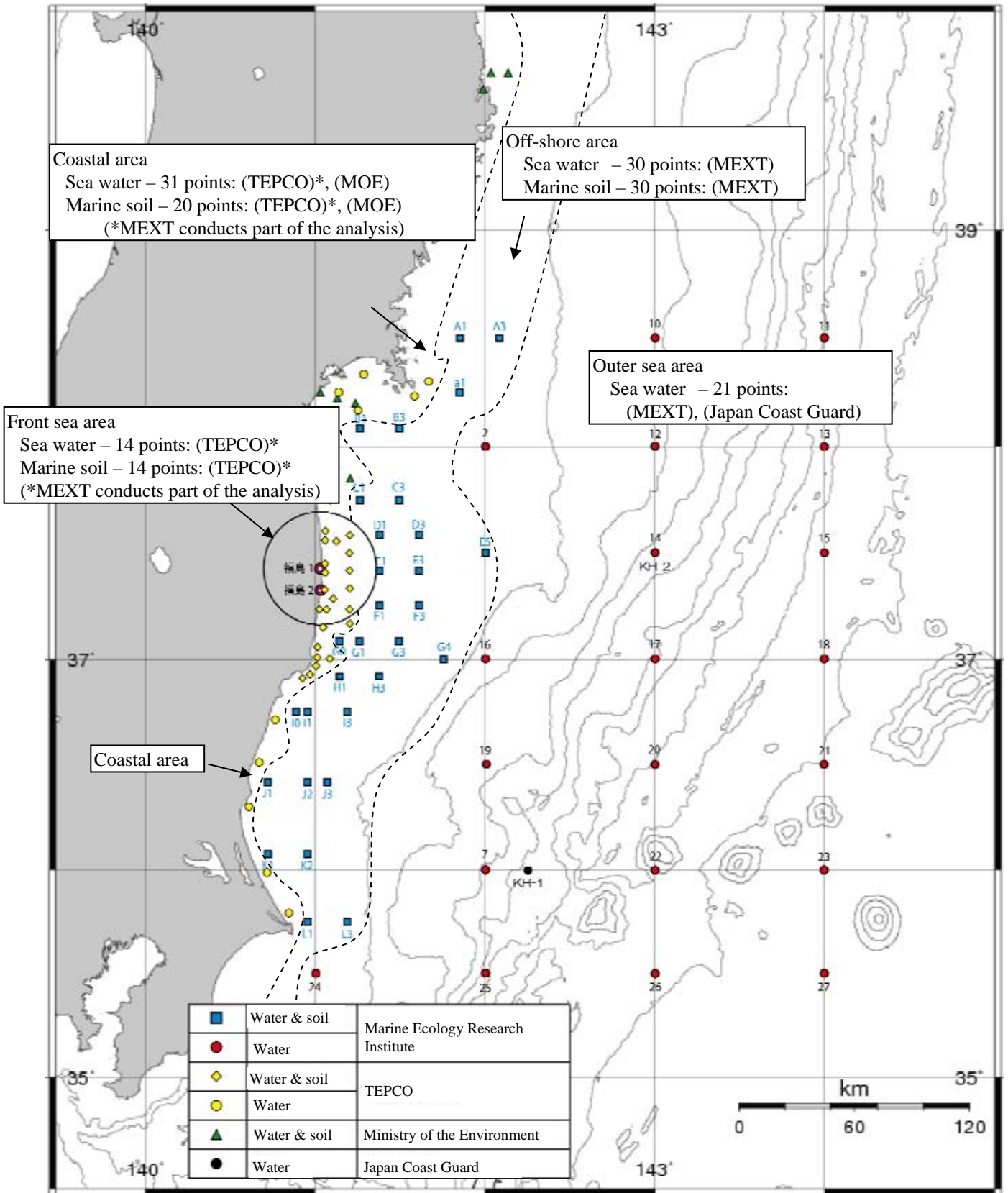
MEXT, Japan Coast Guard, Fisheries Agency (in collaboration with fishery unions), Ministry of the Environment, Meteorological Research Institute of Japan Meteorological Agency, Fukushima Prefecture, related prefectures, and Tokyo Electric Power Company, Inc.

(2) Entities for conducting analysis

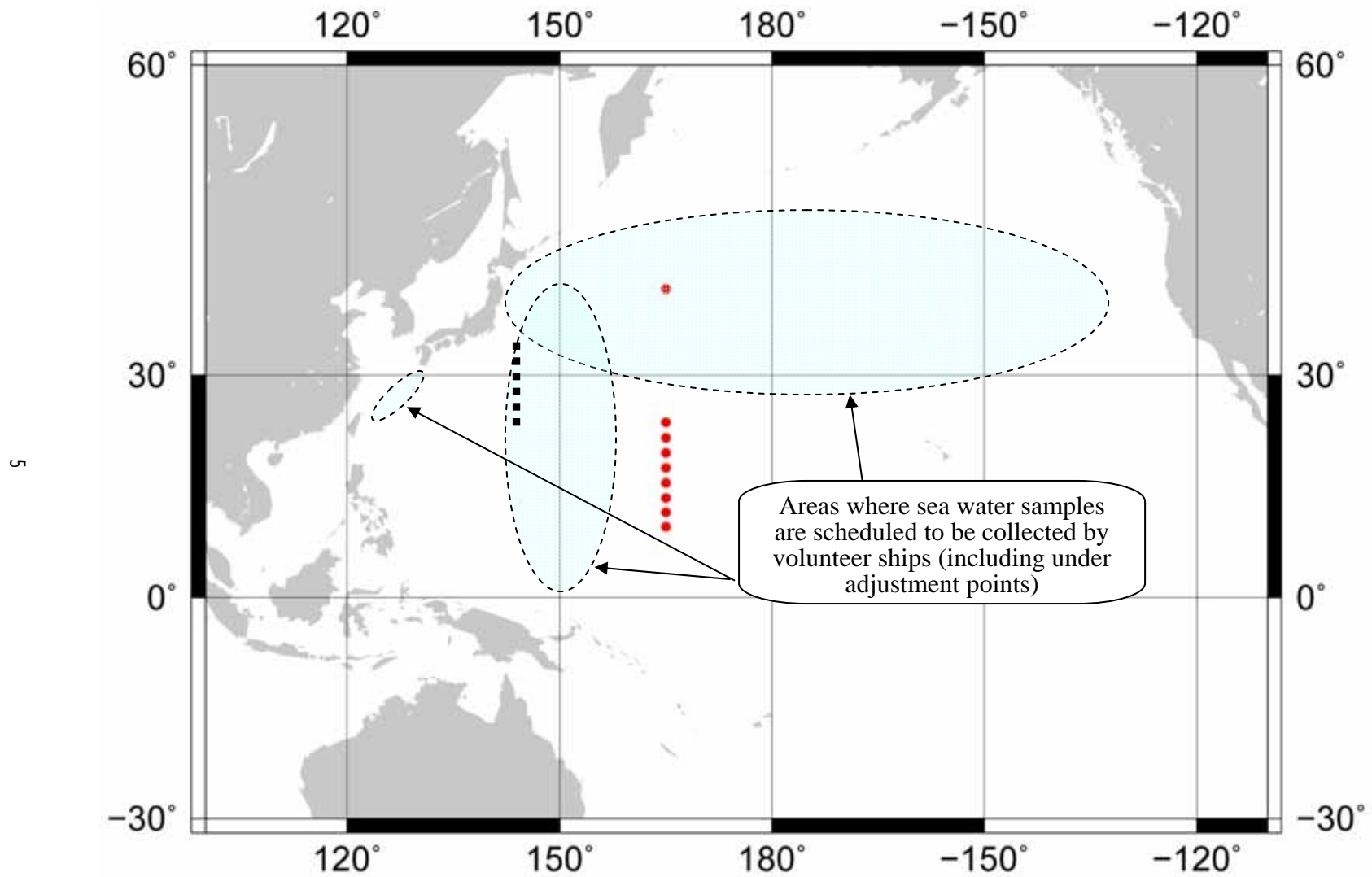
Japan Atomic Energy Agency, Japan Chemical Analysis Center, Fisheries Research Agency, Environmental Radioactivity Monitoring Center of Fukushima (Fukushima branch), Fukushima Agricultural Technology Center, Japan Food Research Laboratories, Kyushu Environmental Evaluation Association, and General Environmental Technos, Co., Ltd.

Based on the measurement results, monitoring points, frequency, target nuclides, and minimum limits of detection, etc. shall be reviewed.

# Target Sea Area for Wider Monitoring



# Map of the Outer Sea Area



- : Sea water at the depth of up to 1000 m is collected by the monitoring ship of the Japan Meteorological Agency
- : Surface water is collected by the Japan Coast Guard