

# Current Radiation Monitoring Activity on Fukushima Dai-ichi NPP Accident

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(welcome to our web site: <https://www.nsr.go.jp/en/>)

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# Comprehensive Radiation Monitoring Plan

(Enacted on February 1, 2019)

## 1. What is Comprehensive Radiation Monitoring Plan ?

On 11 March 2011, a massive amount of radioactive material was released from Tokyo Electric Power Company (TEPCO)'s Fukushima Daiichi Nuclear Power Station (NPS). The Monitoring Coordination Meeting, which was set up under the Nuclear Emergency Response Headquarters, developed “Comprehensive Radiation Monitoring Plan” on 2 August 2011, and the relevant ministries, agencies and others have conducted radiation monitoring.

No significant increase of the concentrations for radionuclides has been found so far, while eight years have passed since the accident at Fukushima Daiichi NPS. However, high air dose rates and high concentrations for radionuclides released by the accident at Fukushima Daiichi NPS have been still found in some areas around Fukushima Daiichi NPS.

Thus, it conducts radiation monitoring continuously.

## 2. Roles and Tasks

- **Nuclear Regulation Authority (NRA)**

The NRA plays the role of Headquarters to make a necessary coordination with other organizations to conduct comprehensive radiation monitoring, and to assess monitored data by the relevant organizations

# Monitoring methods and results on Land

## 1. Methods of measuring radiation dose

### Airborne Monitoring



Aircraft such as helicopter equipped with a detector(s) are used for monitoring. The detailed method is described in the next page.

### Survey Meters



Radiation doses are measured by survey meters.



### Mobile Monitoring

Cars equipped with a detector(s) are used for monitoring.



### Monitoring Posts

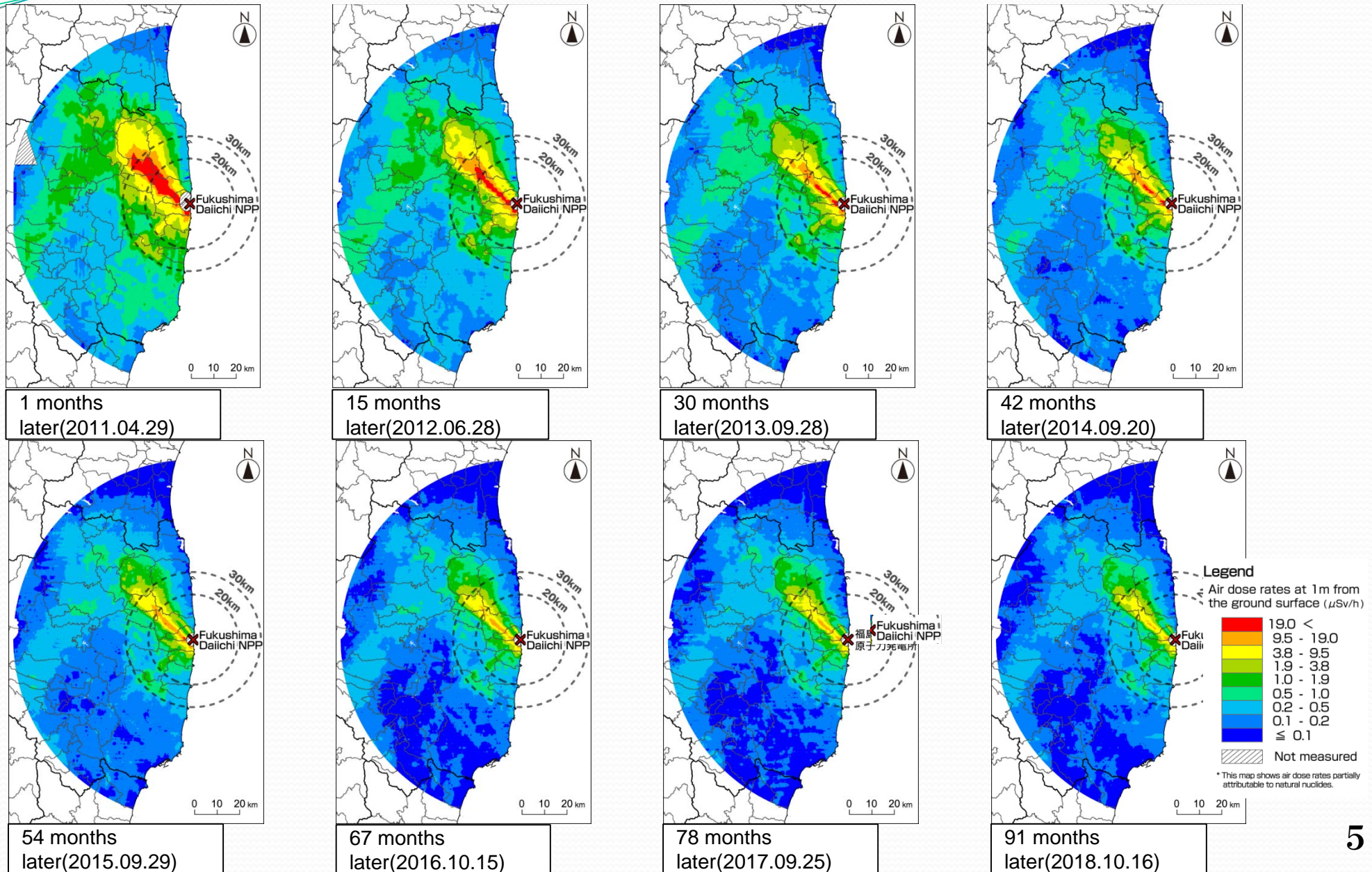
Radiation doses are measured at monitoring posts. Approximately 3600 posts are located in Fukushima Prefecture.





# Monitoring methods and results on Land

## 2. Air dose rates measured by helicopter within 80km zone

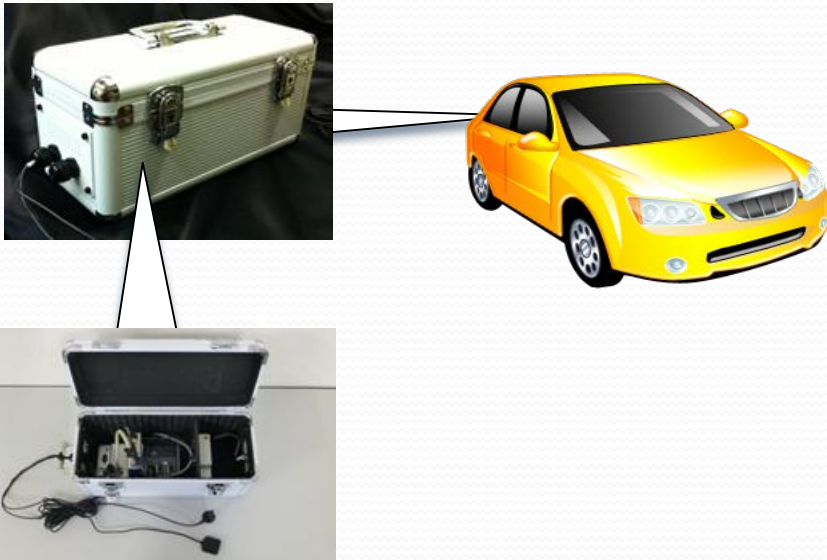


# Monitoring methods and results on Land

## 3.Car-borne & survey meter monitoring trends

### ①Car-borne survey

Car-borne survey is conducted by a vehicle equipped with the KURAMA-II radiation monitoring system.



Radiation monitoring  
system  
(KURAMA-II)

### ②Survey meter monitoring

Environmental radiation survey is conducted by a NaI(Tl) scintillation survey meter at the field of open area around the measurement point.



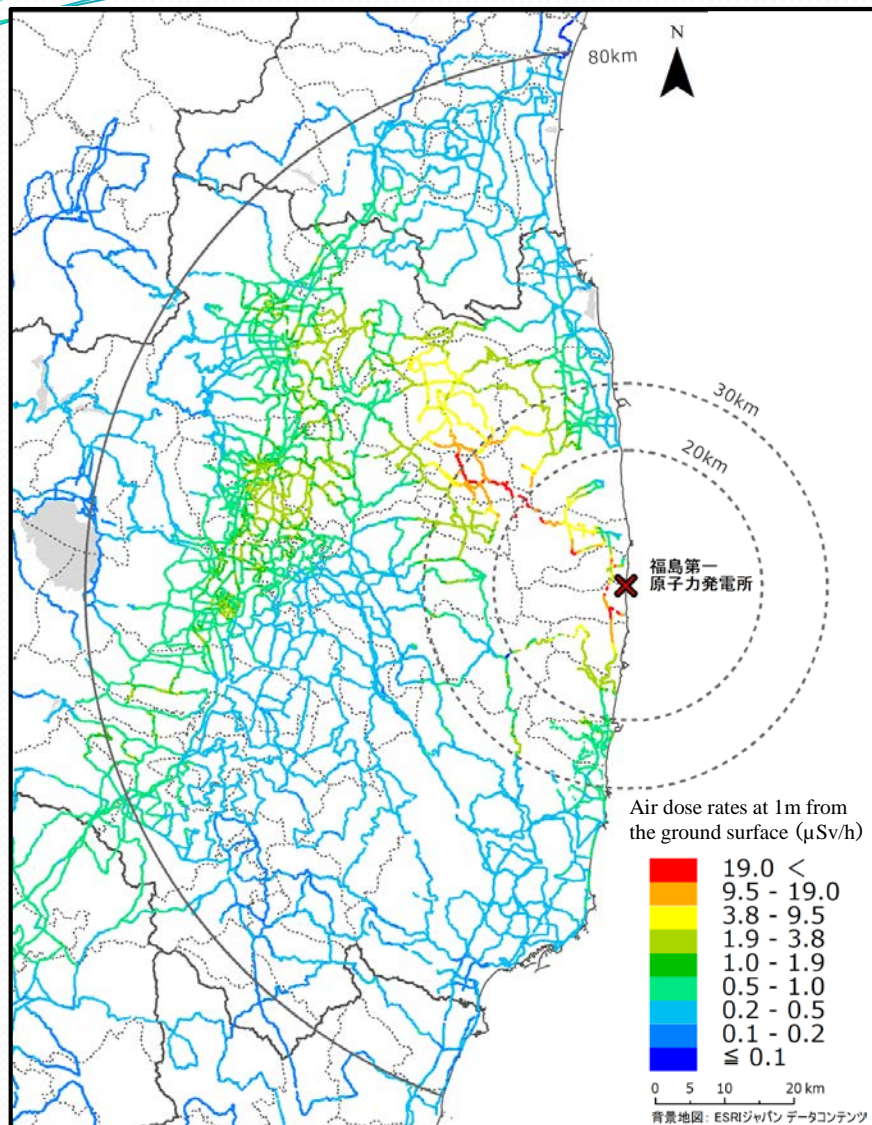
NaI(Tl)  
scintillation  
survey meter



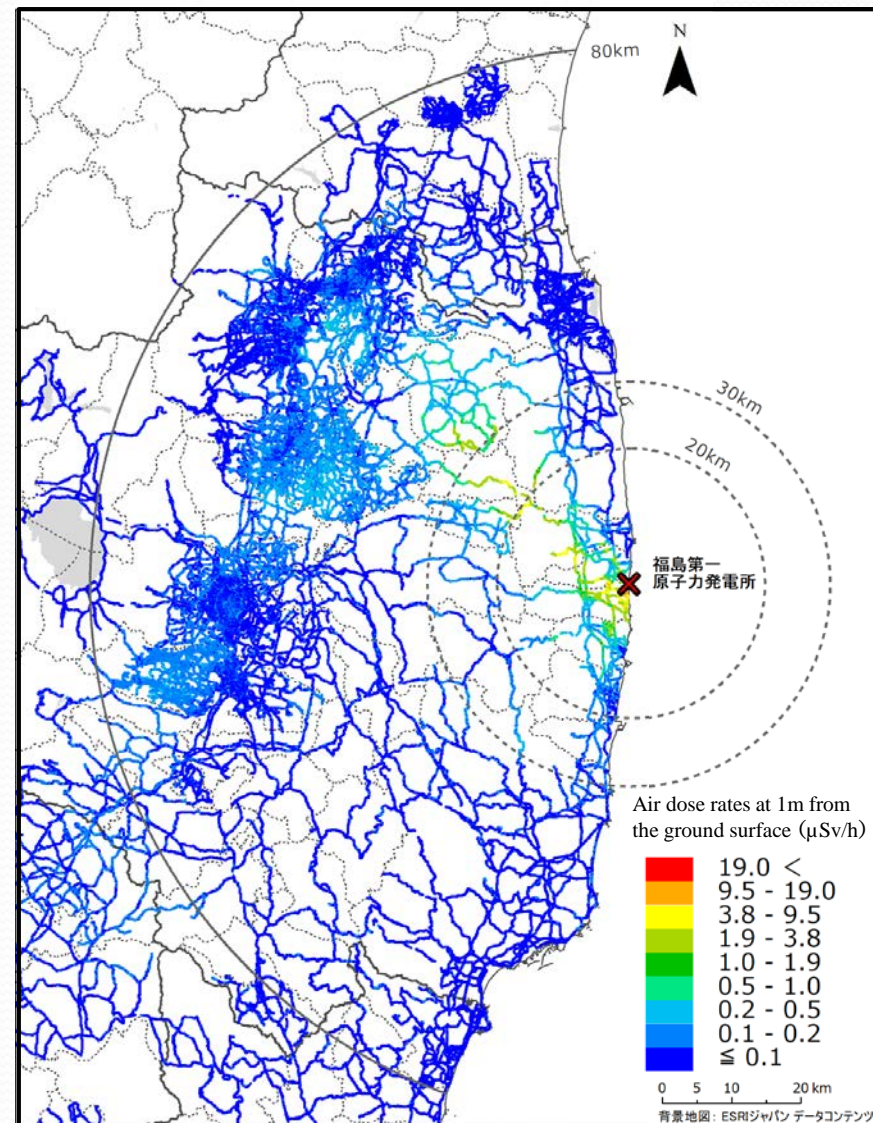


# Monitoring methods and results on Land

## 4. Air dose rates measured by car-borne survey



3 months after the accident (June, 2011)

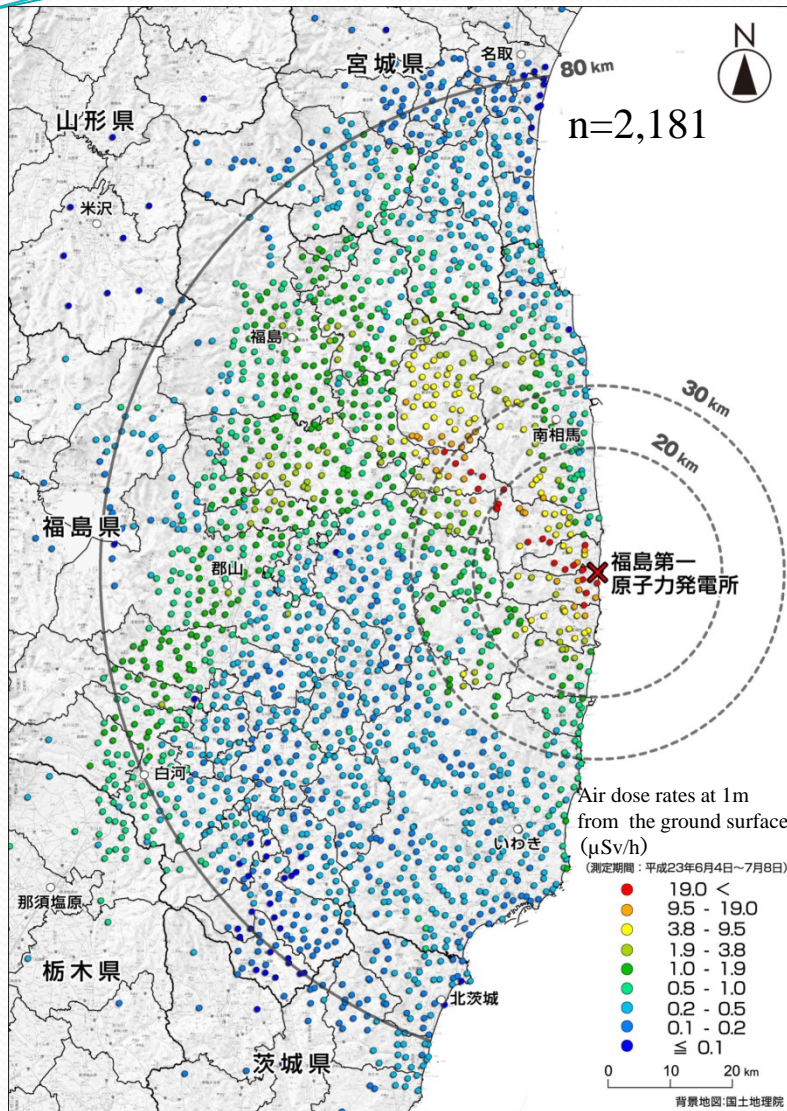


92 months after the accident (November, 2018)

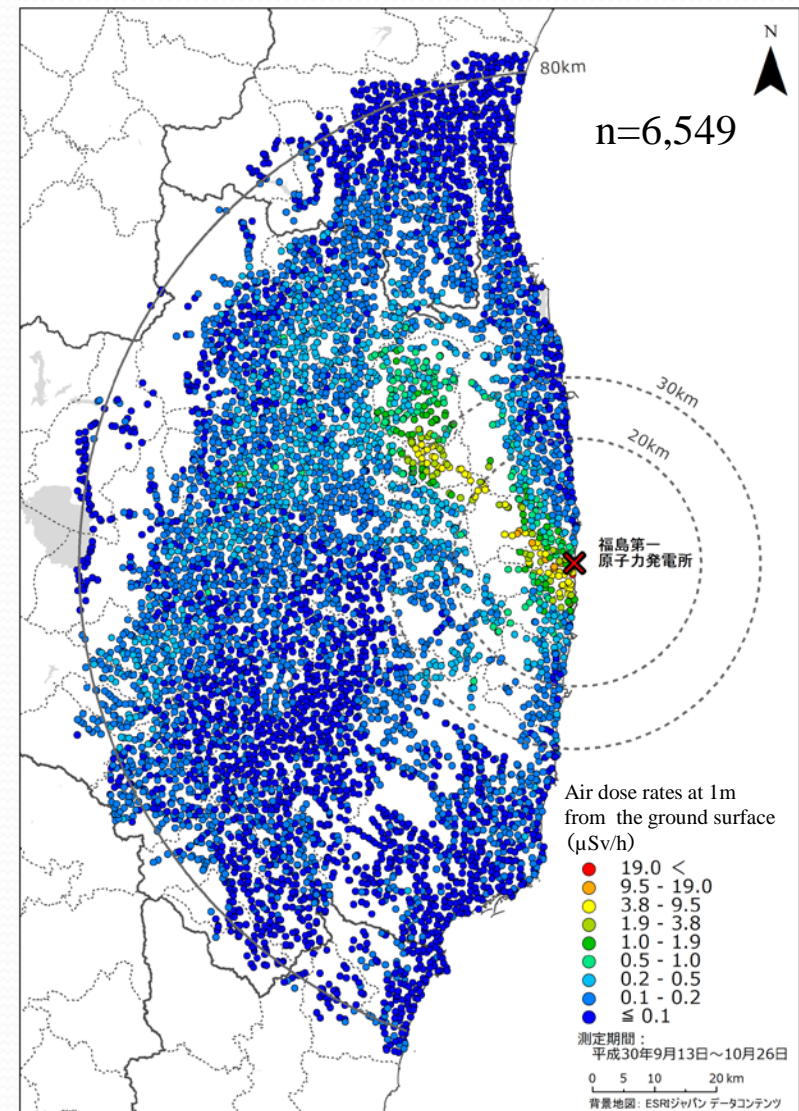


# Monitoring methods and results on Land

## 5. Air dose rates measured by survey meters



3 months after the accident (June, 2011)

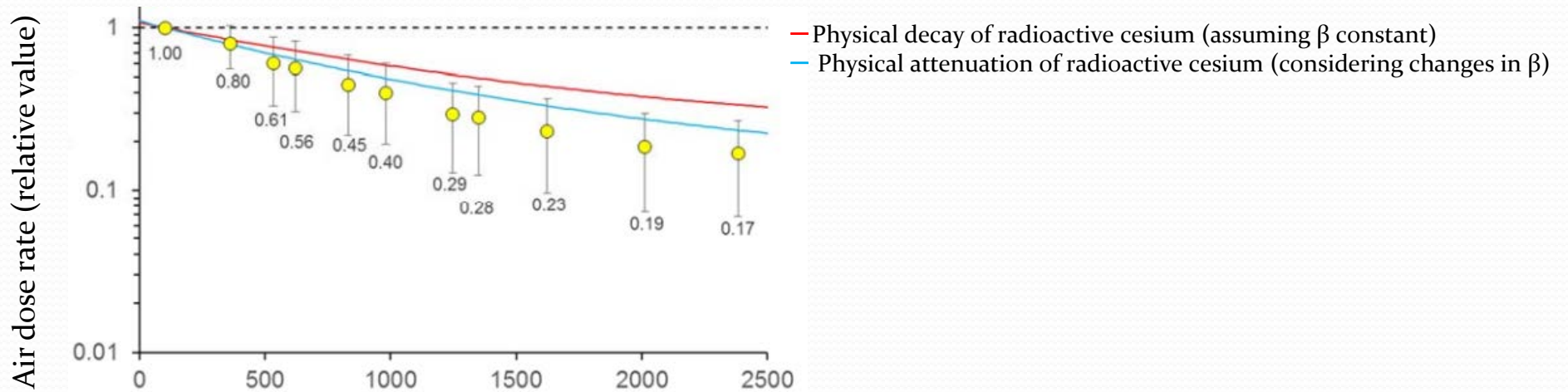


91 months after the accident (October, 2018)

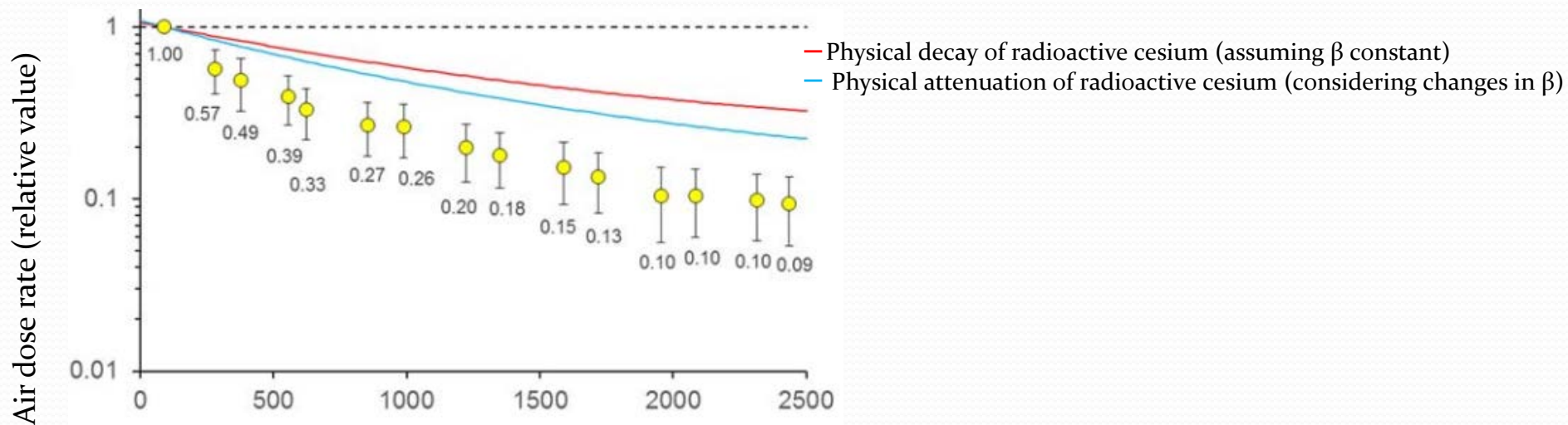
n: number of the measured points

# Monitoring methods and results on Land

## 6. Changes in air dose rate



Change in air dose rate by survey meter

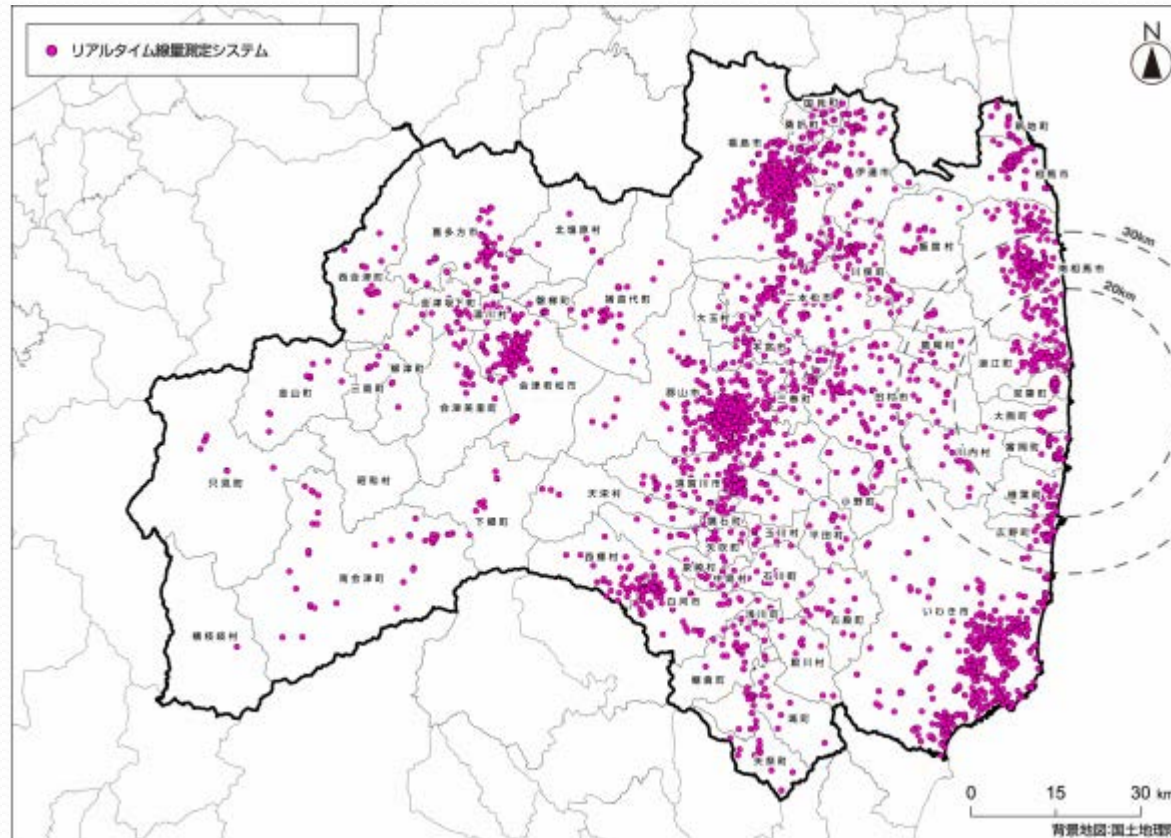


Change in air dose rate by car-borne survey



# Monitoring methods and results on Land

## 7. Monitoring Posts



**Real-time Dose Measurement System**

**Layout of Real-time Dose Measurement System (March,2018)**



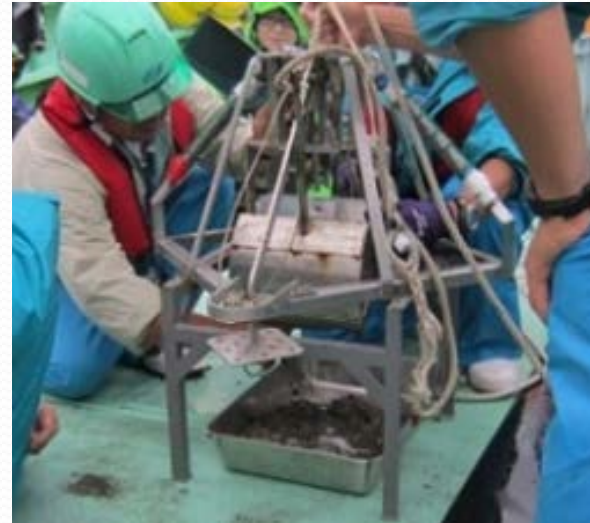
# Monitoring methods and results on Sea area

## 1. Seawater/Sediment Sampling Points for Sea Areas Monitoring

### ① Seawater

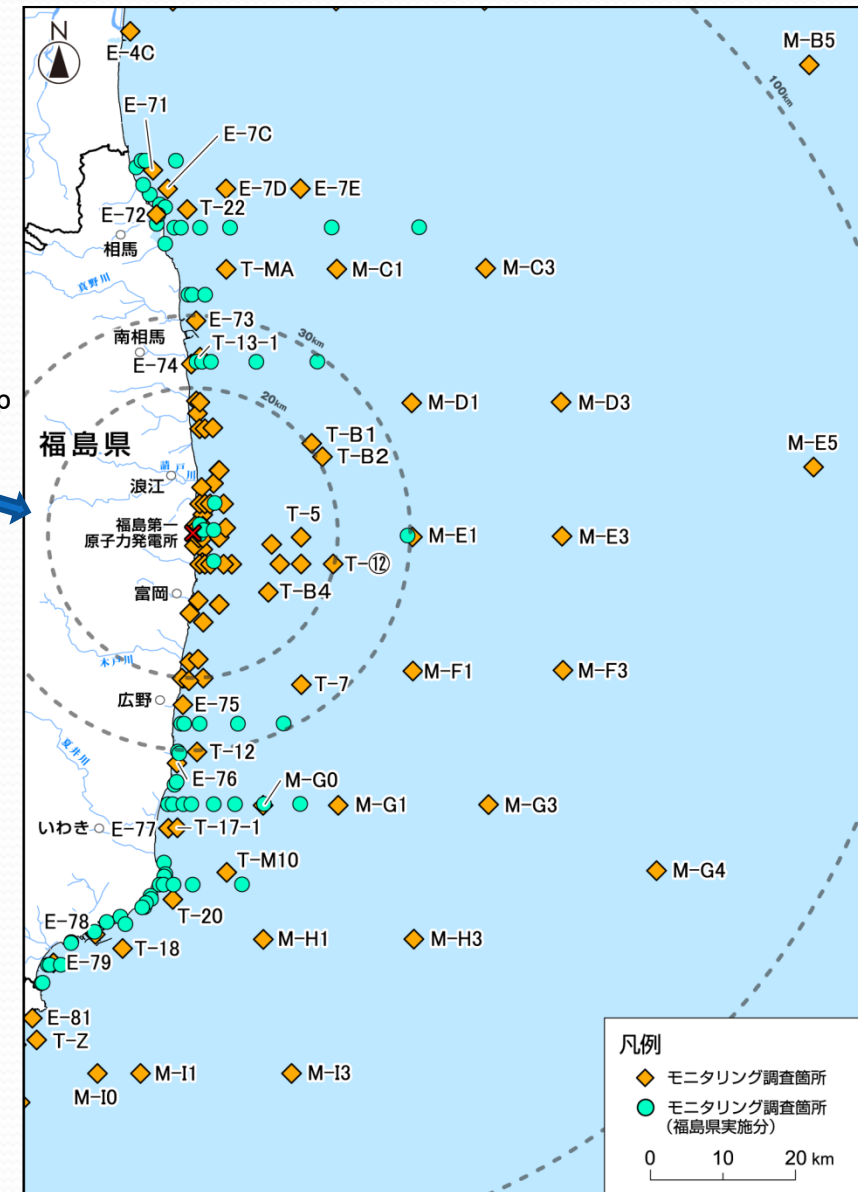


### ② Sediment



Radionuclides that must be measured are Cs-134 and Cs-137.  
Other radionuclides are to be analyzed as necessary

## 2.Seawater/Sediment Sampling Points for Sea Areas Monitoring



# Monitoring methods and results on Sea area

## 3.The most recent radioactivity data of sea area within 2km from the NPS

Sampling point	Sampling Date	Cs-134	Cs-137	Gross $\beta$	H-3	Sr-90	Gross $\alpha$	Pu-238	Pu-239+Pu-240
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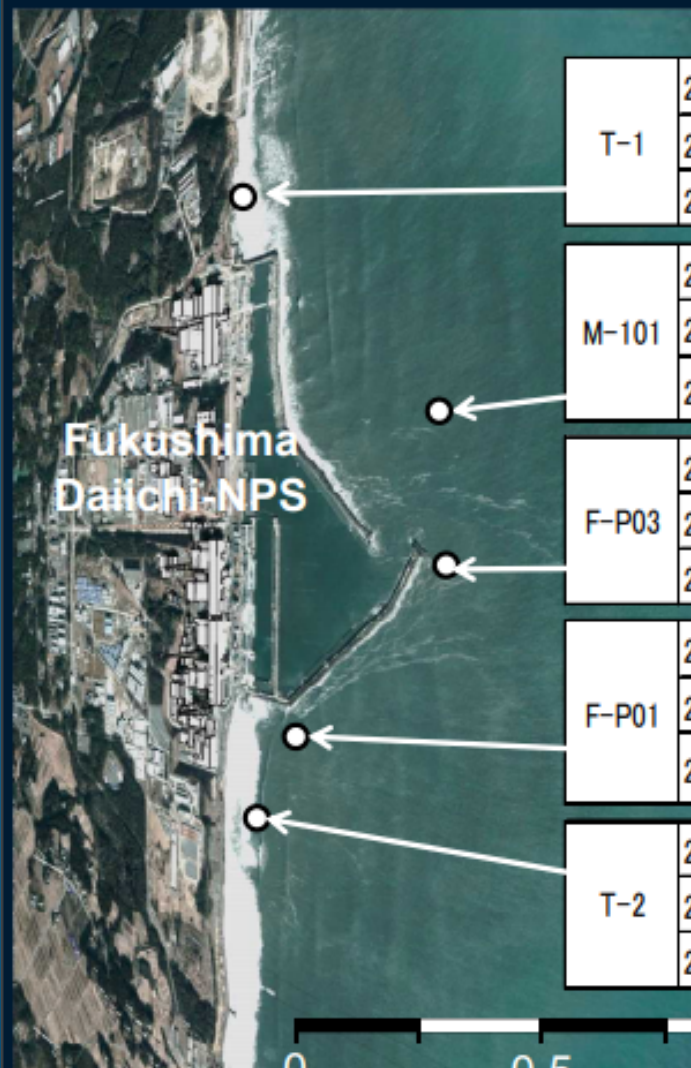
Sea water radioactivity (Bq/L):

ND: Not detected; Numbers in parentheses: detection limits

\* 1 : Gross  $\beta$ : including K-40

\* 2 : Gross  $\beta$ : excluding K-40

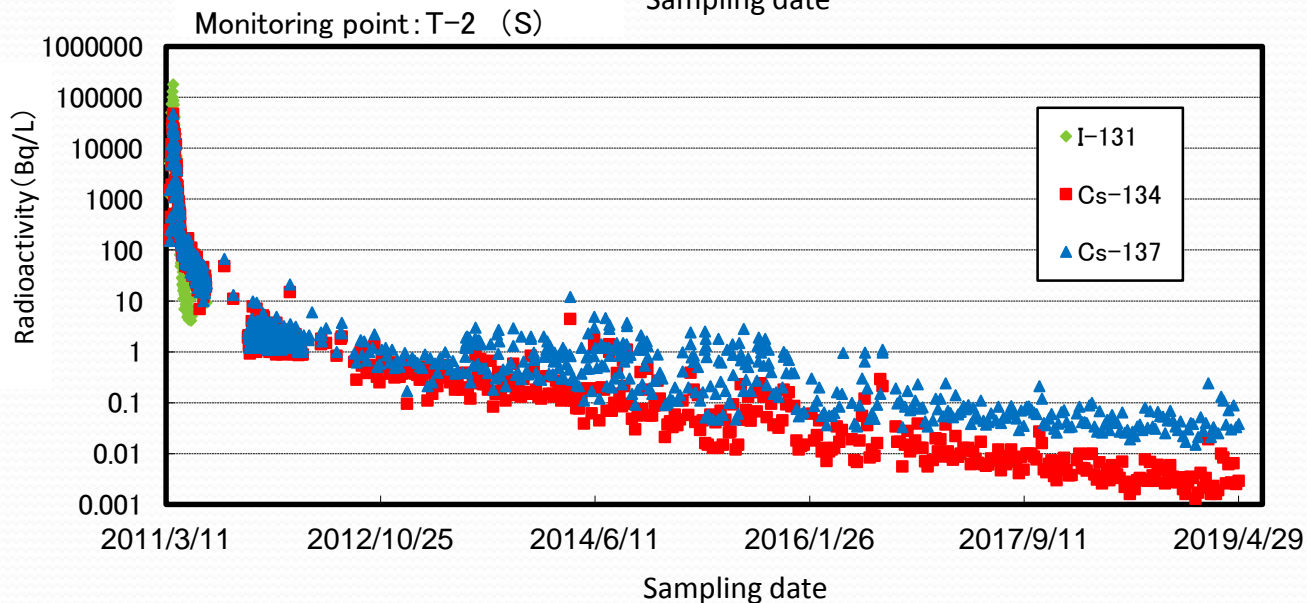
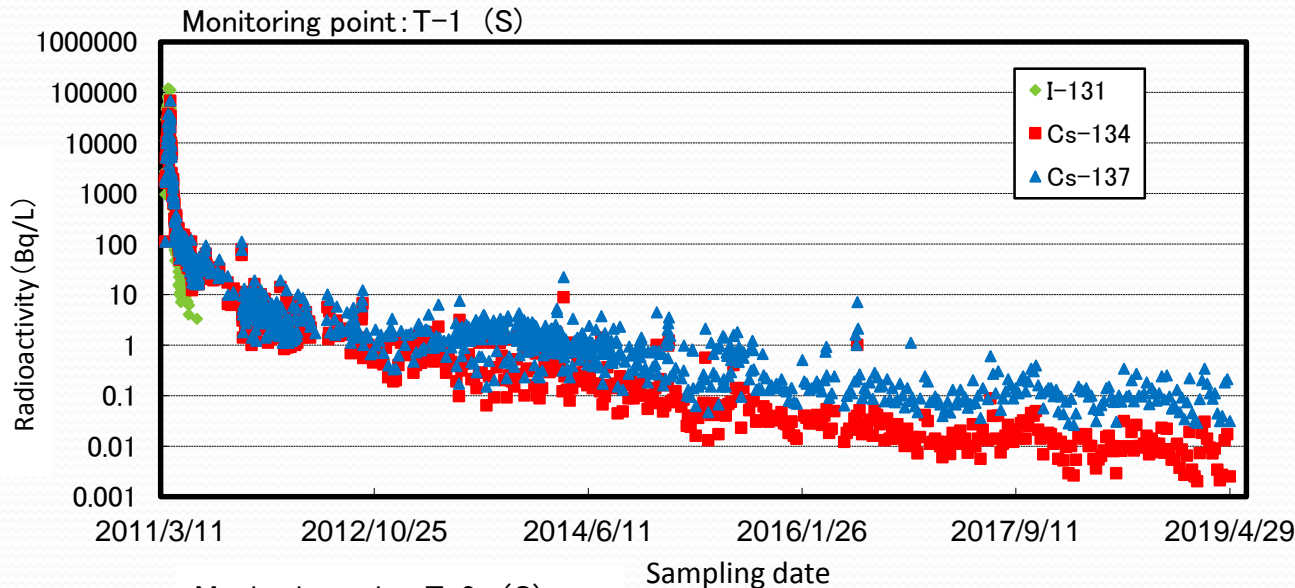
T-1	2019/8/5	0.0012	0.17	12	2.7	0.0047	ND(2.9)		
	2019/10/7	0.0036	0.052	11	ND(0.83)	0.0014	ND(1.9)	ND( $6.4 \times 10^{-6}$ )	ND( $6.4 \times 10^{-6}$ )
	2019/11/4	0.0062	0.085	12	ND(0.84)	0.0027	ND(2.3)		
M-101	2019/8/9	0.0017	0.021		0.12	0.0014			
	2019/9/5	0.0036	0.048		0.21	0.0030			
	2019/10/2	ND(0.00029)	0.004						
F-P03	2019/7/2	0.028	0.38	0.02 <sup>*2</sup>	0.51	0.013		ND( $6 \times 10^{-6}$ )	ND( $6 \times 10^{-6}$ )
	2019/8/1	0.014	0.18	0.02 <sup>*2</sup>	0.51	0.0047		ND( $8 \times 10^{-6}$ )	ND( $8 \times 10^{-6}$ )
	2019/9/20	0.023	0.33	0.02 <sup>*2</sup>	0.66	0.010		ND( $9 \times 10^{-6}$ )	ND( $8 \times 10^{-6}$ )
F-P01	2019/7/2	ND(0.003)	0.024	0.03 <sup>*2</sup>	ND(0.35)	0.0017		ND( $7 \times 10^{-6}$ )	ND( $9 \times 10^{-6}$ )
	2019/8/1	ND(0.003)	0.017	0.02 <sup>*2</sup>	ND(0.34)	0.0011		ND( $8 \times 10^{-6}$ )	ND( $7 \times 10^{-6}$ )
	2019/9/20	ND(0.002)	0.005	0.02 <sup>*2</sup>	ND(0.34)	0.0011		ND( $7 \times 10^{-6}$ )	ND( $8 \times 10^{-6}$ )
T-2	2019/9/2	0.0026	0.038	9.3	ND(0.83)	0.0015	ND(2.2)		
	2019/10/7	0.0031	0.050	12	ND(0.83)	0.0022	ND(2.4)	ND( $6.4 \times 10^{-6}$ )	ND( $6.4 \times 10^{-6}$ )
	2019/11/4	0.0066	0.10	13	ND(0.84)	0.011	ND(2.2)		





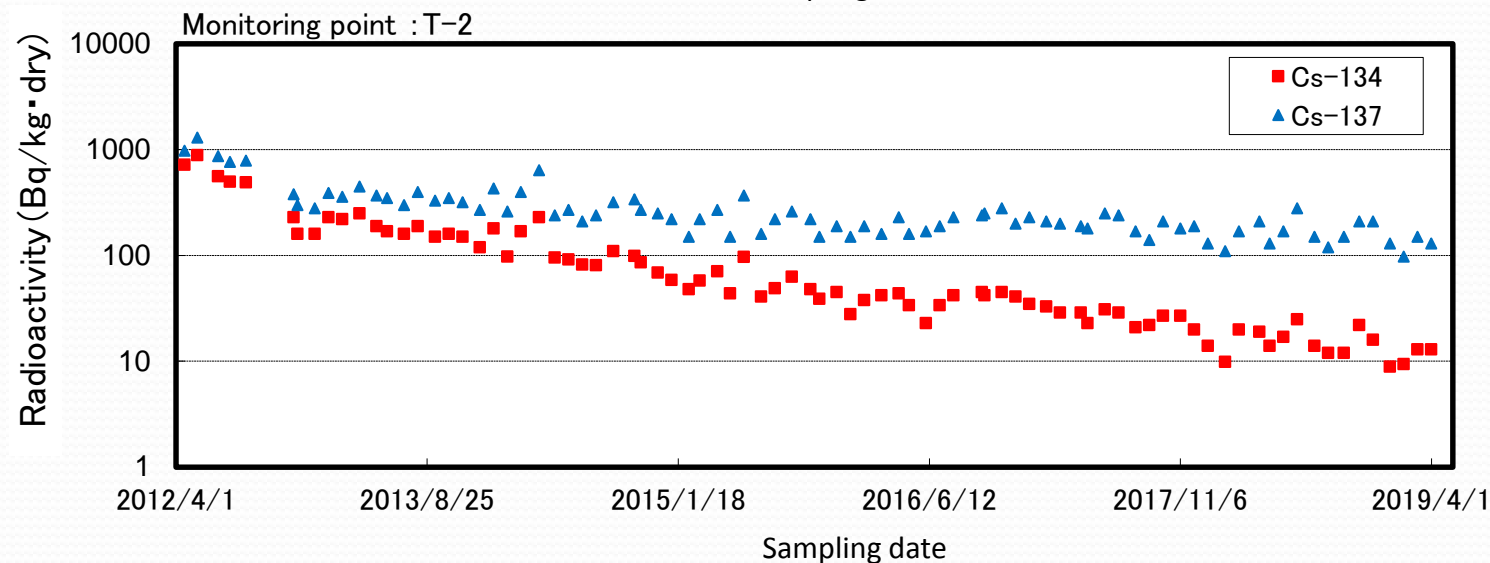
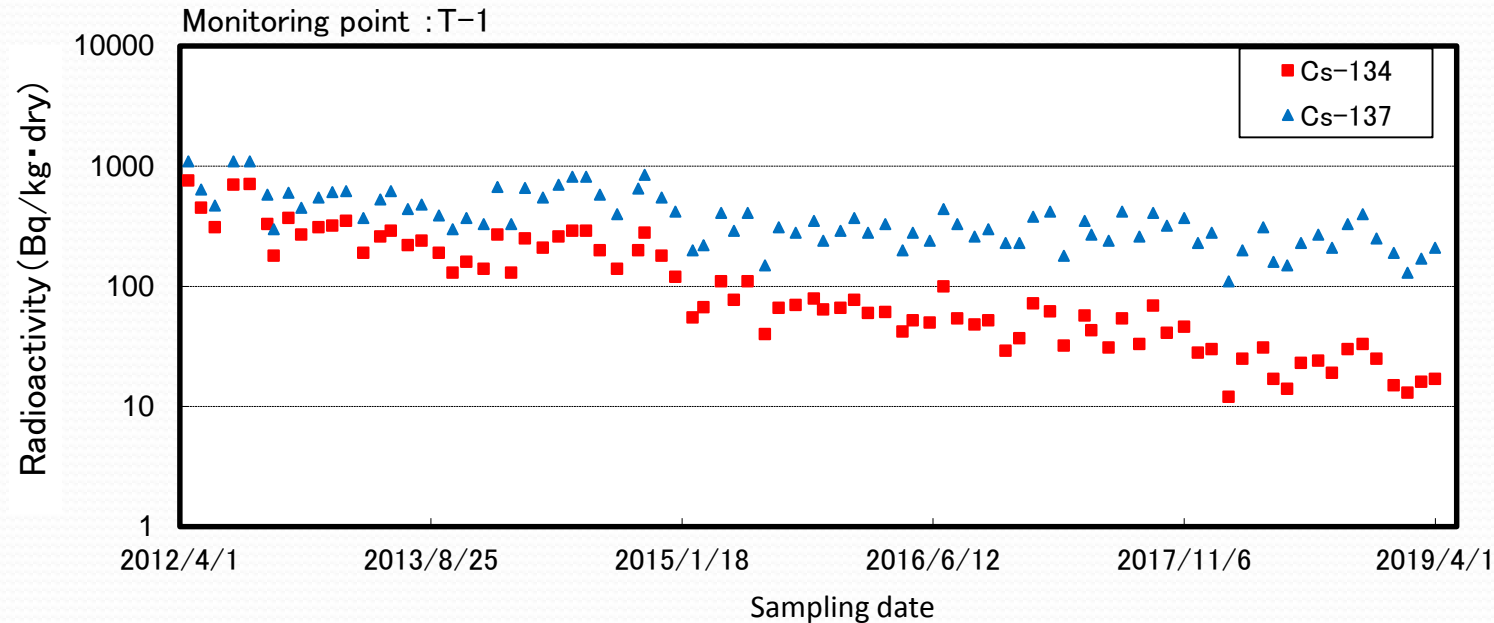
# Monitoring methods and results on Sea area

## 4. Change of the radioactivity concentration of the seawater in sea area close to Fukushima Daiichi NPS / coastal sea area



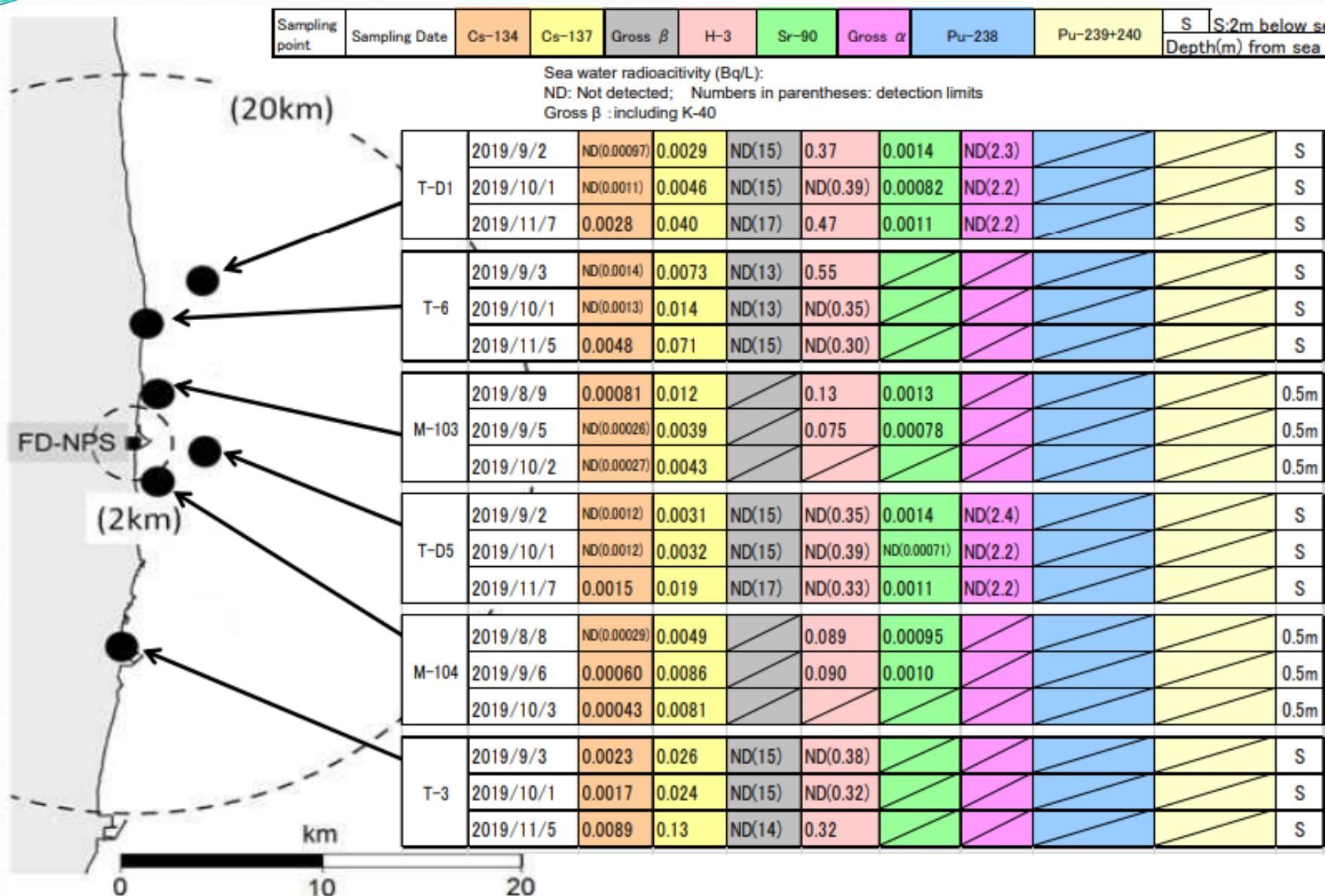
# Monitoring methods and results on Sea area

## 5.Change of the radioactivity concentration of the sediment in sea area close to Fukushima Daiichi NPS / coastal sea area



# Monitoring methods and results on Sea area

## 6. Most recent radioactivity data of sea area between 2-20km from the NPS





### 3. Monitoring outside Comprehensive Radiation Monitoring Plan

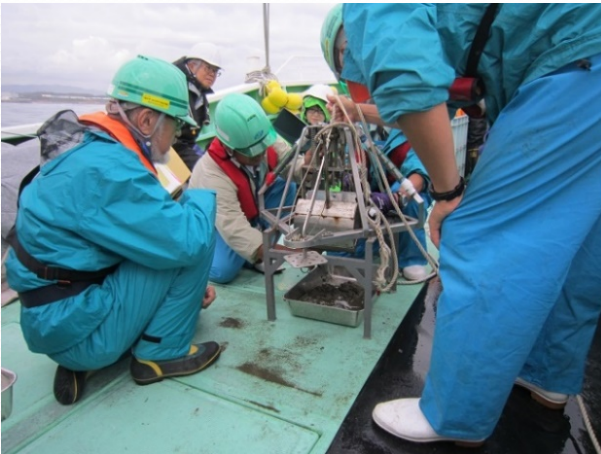
#### Inter-laboratory comparisons between IAEA and Japan for sea area monitoring (2014~ )



Marine samples were collected from the vessels off the coast of TEPCO's Fukushima Daiichi Nuclear Power Station.



A large plastic container with valves was filled with surface seawater and sub-samples of 20L-plastic containers were filled from each valve.



The surface sediment samples were collected using a grab sampler.

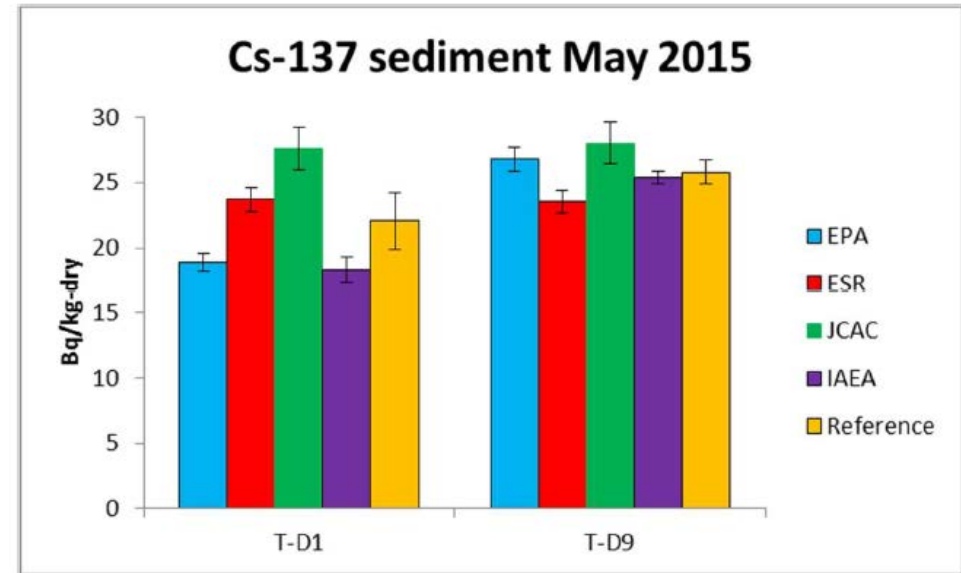
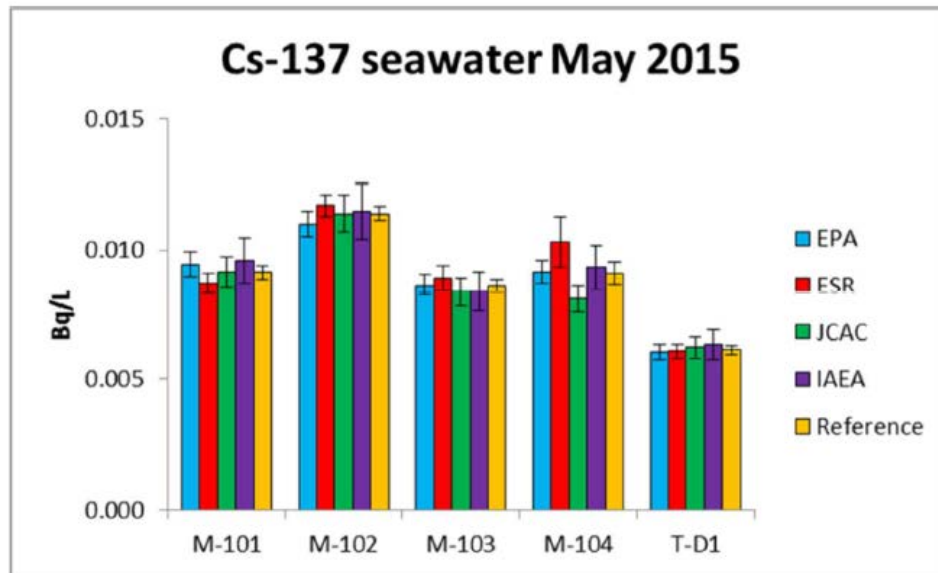


Division of sediment samples by the splitter. These samples were subsequently analyzed in parallel by laboratories in Japan and IAEA.

### 3. Monitoring outside Comprehensive Radiation Monitoring Plan

#### Results of Seawater and Sediment Inter-laboratory Comparison between IAEA and Japan

<https://www.iaea.org/newscenter/news/japanese-data-on-marine-samples-near-fukushima-reliable-iaea-report-concludes>



- The above charts demonstrated consistency among laboratories concerning the concentration of Cesium-137 in seawater samples and sediment samples.
- IAEA found that Japanese labs are reliable in analyzing seawater, sediment and fish samples near Fukushima.

## 4. Dissemination of monitoring information

Monitoring data after TEPCO's Fukushima NPS accident are available in this URL:

<https://radioactivity.nsr.go.jp/en/>

Monitoring information  
of environmental radioactivity level

→ Japanese



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Report

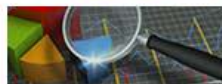
Database / Distribution map

Others

### Sea area monitoring

The relevant ministries (including the NRA) conduct the monitoring of seawater, sea-bottom soil and biota, and publish the results of the monitoring.

→ MORE





# 5. Summary

- Environmental radiation has been monitored based on 'Comprehensive Radiation Monitoring Plan' continuously.
- The results of monitoring for environmental radioactive materials have been becoming more stably lower compared to the time of the accident.
- Monitoring results are sent through NRA's website.

Thank you for your attention



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Nuclear Regulation Authority