

*NRA presentation*

# **D-2 Overview of NRA's Environmental monitoring based on Comprehensive Radiation Monitoring Plan**

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1. Comprehensive Radiation Monitoring Plan
2. NRA's Sea Area Monitoring
3. Enhancement of NRA's Sea Area Monitoring
4. Next Steps

# Comprehensive Radiation Monitoring Plan



- To monitor the radioactive materials discharged into the environment due to the accident at TEPCO's Fukushima Daiichi NPS in a coordinated manner, the government set up **Monitoring Coordination Meeting(MCM)**, Japan
  - ✓ Chairperson : Minister of the Environment
  - ✓ Member : Relevant Ministries\*, Fukushima Prefecture government, TEPCO
- MCM formulated **Comprehensive Radiation Monitoring Plan** in 2011. The plan is regularly reviewed and revised.
- Based on this plan, the relevant ministries, the local government and the operator of nuclear facilities separately but complementarily project, implement and report their own radiation monitoring activities.
- Each relevant ministry implements radiation monitoring in line with its administrative objectives.

\*Relevant ministries:

Nuclear Emergency Response Headquarters, Cabinet Office, National Policy Agency, Ministry of Education, Culture, Sports, Science and Technology(MEXT), Ministry of Health, Labor and Welfare(MHLW), Ministry of Agriculture, Forestry and Fisheries(MAFF), Fisheries Agency(FAJ), Ministry of Land, Infrastructure, Transport and Tourism(MLIT), Japan Coast Guard, Ministry of the Environment(MOE), **Nuclear Regulation Authority(NRA)**, Ministry of Defense

# Comprehensive Radiation Monitoring Plan



Coordination	Implementing of monitoring	
<p>MOE/NRA</p> <ol style="list-style-type: none"> <li>1. Secretariat of Monitoring Coordination Meeting</li> <li>2. Planning of terrestrial and aquatic environment, sea areas, and other monitoring</li> <li>3. Coordinating the roles of relevant organizations</li> <li>4. Providing scientific and technical advice to other ministries</li> <li>5. Disseminating monitoring data of relevant organizations</li> </ol>	<p>MOE/NRA : Terrestrial and aquatic environment, sea area, wild fauna and flora, waste</p>	<p>Fukushima prefecture</p>
	<p>MAFF/ FAJ : agricultural soil, forests, pastures</p>	
	<p>MHLW : supplied water, foodstuff</p>	
	<p>MLIT : ports, parks, sewage systems</p>	
	<p>MEXT : schools</p>	
	<p>TEPCO : Terrestrial and aquatic environment, sea area</p>	
<p>*NRA : check TEPCO's QMS</p>		



Sea area monitoring by relevant organizations ;

**GOJ**

✓ MOE/ NRA : Implementing monitoring of seawater and sea sediment

- (1) Nearshore sea area: approximately 3 km radius from FDNPP
- (2) Coastal sea area: within approximately 30 km from the coastline
- (3) Offshore sea area: within approximately 30 to 90 km from the coastline
- (4) Open sea: beyond approximately 90 km from the coastline
- (5) Tokyo Bay: a closed sea area where the inflow and accumulation of radioactive materials from rivers is of particular concern

✓ FAJ : implementing fishery products monitoring

**TEPCO**

: Implementing monitoring at nearshore sea area.

The largest contributor in terms of the number of samples and locations

**Fukushima pref.**

: community-based monitoring

# NRA's Sea Area Monitoring



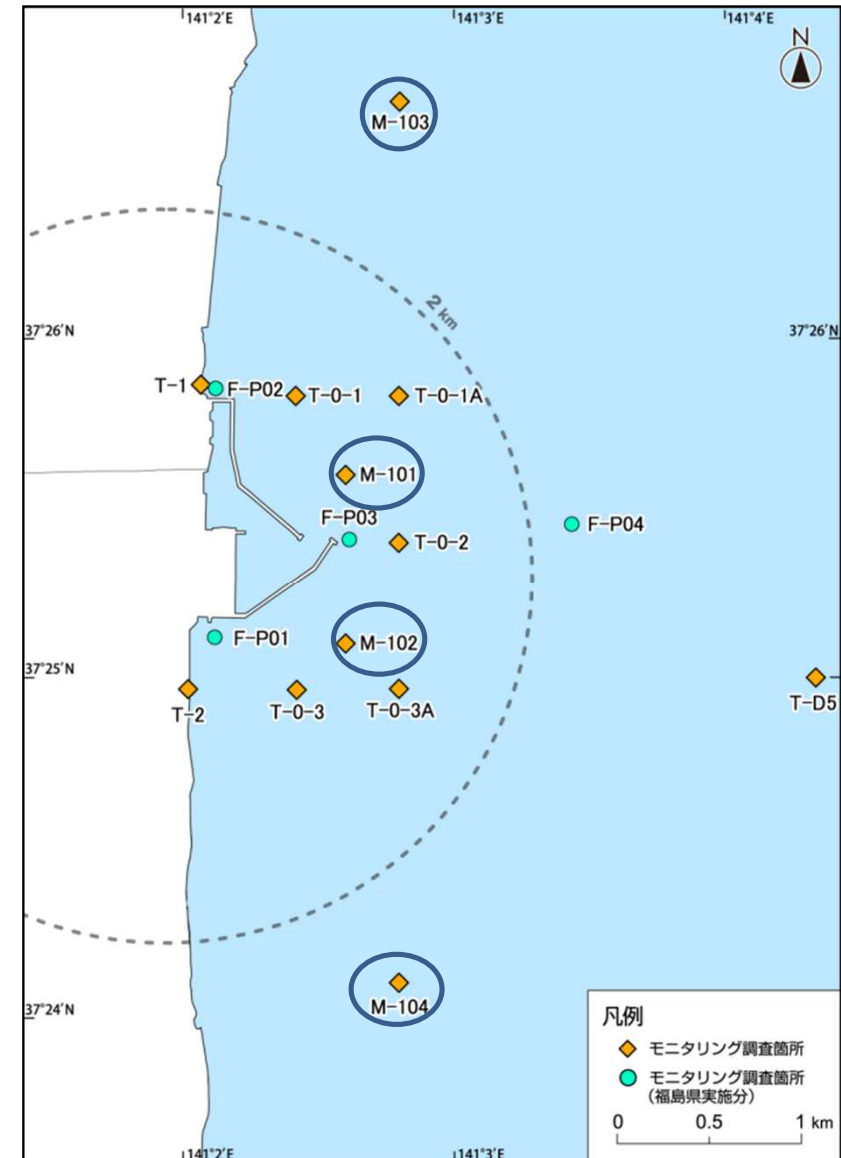
## Nearshore sea area

### Outline of the monitoring

- Location : 4 (as indicated in the figure)
- Frequency : 12times/year
- Sample : 48/year

### Activity Concentrations (FY2020)

Nuclide	Value
Cesium-134	<0.013Bq/L
Cesium-137	0.0019~0.20Bq/L
Tritium	<0.35 Bq/L
Strontium-90	0.00068~0.011 Bq/L





# NRA's Sea Area Monitoring



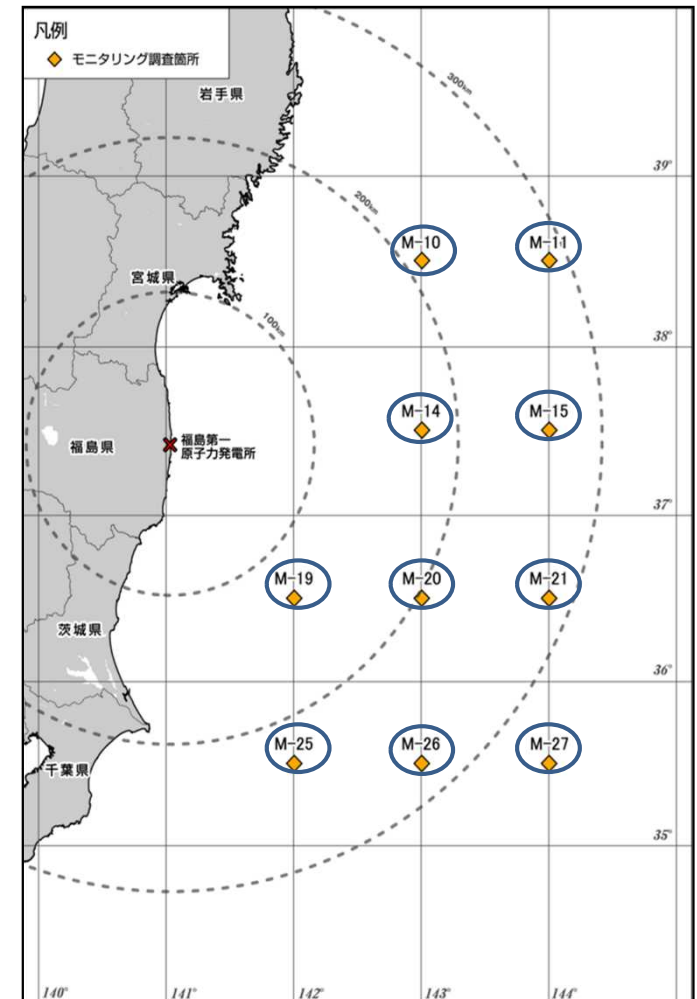
Open sea

## Outline of the monitoring

- Location : 10 (as indicated in the figure)
- Frequency : 2 times/year
- Sample : 100/year

Activity Concentrations (FY2020)

nuclide	value
Cesium-134	All below the detection limit (0.00042-0.00076 Bq/L)
Cesium-137	< 0.0027 Bq/L







## Discussion points at the Expert Meeting

Experts meeting on sea area monitoring regarding ALPS treated water  
Secretariat: Ministry of the Environment

- Members: Researchers specializing in environmental engineering, environmental radioactivity and marine radiation ecology, and tritium science and engineering.
- Discussion points for monitoring before discharge:
  - ✓ Objectives of the Sea Area Monitoring
  - ✓ Target(Environmental sample)
  - ✓ Nuclide
  - ✓ Locations for sampling
  - ✓ Frequency
  - ✓ Lower detection limit , etc.



## Output of the Expert Meeting

- Enhancing monitoring on tritium and other radionuclides in seawater and aquatic organisms
  - Tritium in seawater and aquatic organisms (4 times a year)
  - 7 major radionuclides in seawater (4 times a year)
  - I-129 and C-14 in aquatic organisms (4 times a year)
  - 62 ALPS target radionuclides and C-14 in seawater (once a year)
- Confirming analytical capacity in order to ensure reliability of monitoring
- For post-discharge monitoring, considering raising the lower detection limit to obtain monitoring results more quickly

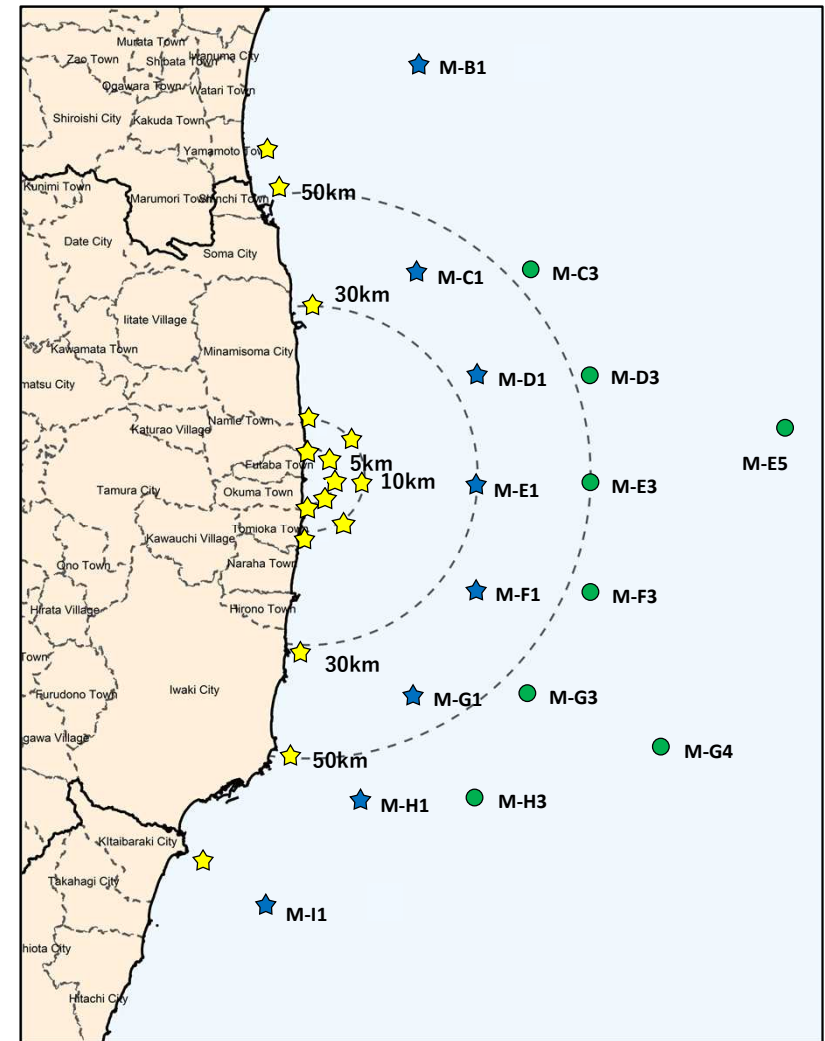
# Enhancement of NRA's Sea Area Monitoring



- Increased tritium monitoring locations (8 blue star points in the figure)
- Lowered tritium detection limit (0.1 Bq/L)
- Additional bottom layer sampling for tritium within 50 km range from the outlet

★ : Additional locations for seawater tritium  
(Existing locations for cesium and strontium will be utilized)

● : Existing locations for seawater tritium  
(Plus 4 locations in nearshore sea area)



# Summary of sea area monitoring plan for ALPS Treated Water

Reference;  
Enhancement of GOJ's  
sea area monitoring

(2022.Feb.09 experts meeting)  
on sea area monitoring

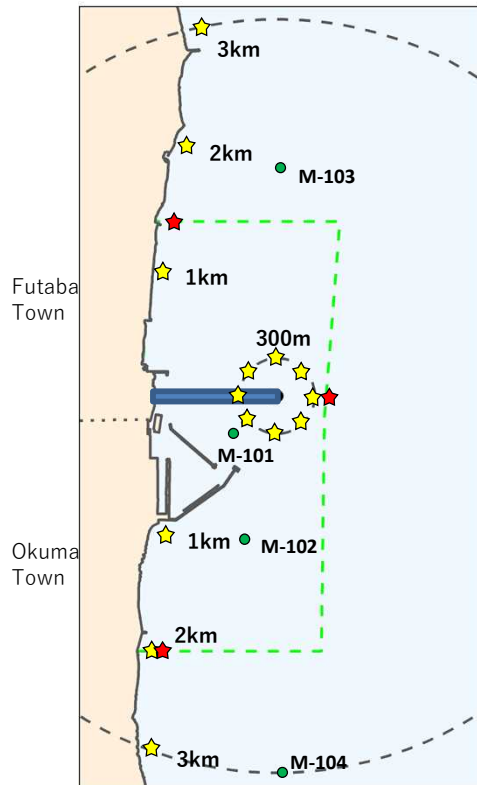
## Seawater

- a. According to the government's basic policy, when ALPS treated water is discharged into the ocean, the tritium concentration must be less than 1500 Bq/l.
- b. Monitoring is going to be conducted to understand changes in tritium concentration in the sea area before and after discharge.
  - ◆ It is assumed that the concentration at the distance of about 10 km from the outlet will be almost indistinguishable from that before the discharge. (It should be noted that the diffusion simulation conducted by TEPCO showed that depending on the day there is a possibility of minute fluctuations even at a point about 30 km away.)
  - ◆ We will set more stations within the 10 km range from the outlet
  - ◆ To be safe, we will also carry out monitoring at stations 30 km and 50 km away, and also in the southern offshore of Miyagi prefecture and the northern offshore of Ibaraki prefecture.
  - ◆ We will monitor nearby beaches as well.
- c. The measurement for the newly added stations will be conducted four times a year in consideration of seasonal fluctuations. We will increase the measurement frequency of those immediately after the discharge, including the preliminary results conducted at a higher detection limit.
- d. To be safe, we will also carry out the measurements on the 7 major radionuclides four times a year at some stations. In addition, we will also conduct annual monitoring for a broad range of other relating radionuclides.

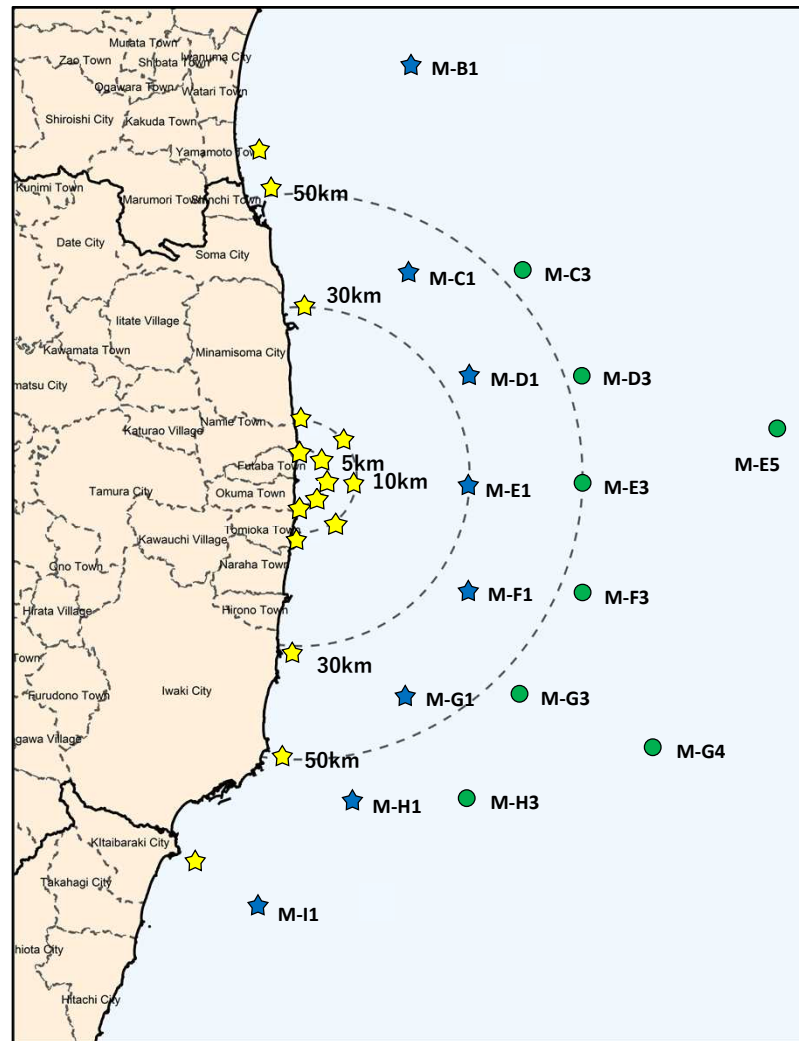
(7 major radionuclides: Cesium-134, Cesium-137, Cobalt-60, Ruthenium-106, Antimony-125, Strontium-90, Iodine-129)

## Aquatic organisms

- e. We will monitor tritium (FWT: Free Water Tritium, OBT: Organically Bound Tritium) in aquatic organisms at stations near the boundary of the area where fishing is conducted on a daily basis.
- f. We will also monitor Carbon-14 in fish and Iodine-129 in seaweed at the stations monitored for “e”

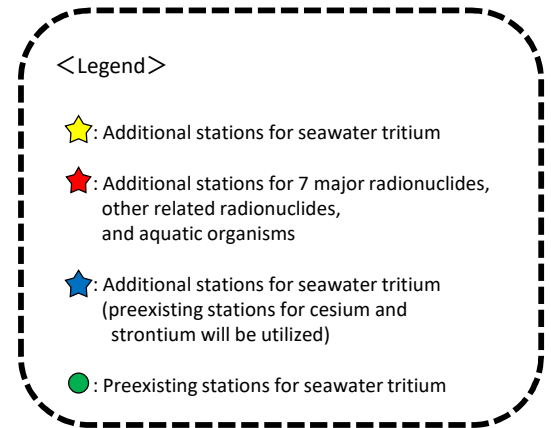


【Enlarged map (Within a 3km radius)】



【Wide area map】

(Two stations to monitor the beach will be added on the north and south sides respectively)



An area where no fishing is conducted on a daily basis (1.5km East-West direction, 3.5km North-South direction)



- Revision of Comprehensive Radiation Monitoring Plan (Mar. 2022)
  - Commencement of the enhanced sea area monitoring before discharge (Spring. 2022~)
  - Consideration of a monitoring plan during discharge
    - ✓ Higher frequency ?
    - ✓ Quicker reporting (ex. higher detection limit) ?
    - ✓ Enough analytical capacity?
    - ✓ Streamlining of monitoring locations ?
- etc.