

# Marine Organisms Rearing Test using ALPS Treated Water

## Purpose of marine organisms rearing test (Starting from September 2022)

- Tritium contained in ALPS treated water will be discharged at the concentration far below the regulatory standard for the discharge to the environment
- It is known that tritium is "not concentrated in the living bodies and that the concentration does not exceed that of the rearing environment", etc.

We would like to demonstrate that "tritium is not concentrated in the living bodies and that the tritium concentration does not exceed that of the rearing environment" same as domestic and abroad knowledge by rearing marine organisms in seawater which ALPS treated water is added. Also we would like to demonstrate the rearing status of marine organism in an actual, visible manner.

## (Reference) Scientific findings from previous domestic and abroad study results

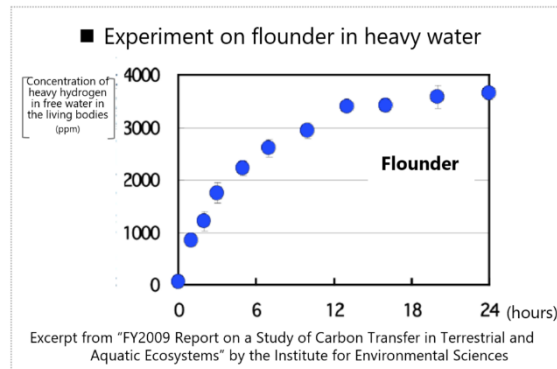
- The tritium concentration in the living bodies **does not exceed that of the rearing environment**
- The tritium concentration in the living bodies **reaches an equilibrium after a certain period of time**

Tritium in the living bodies is of two types:  
Free water tritium (FWT) and Organically bound tritium (OBT).

FWT: Tritium that exists in the form of water in the living bodies  
OBT: Tritium that is organically bound with molecules in living bodies

The right graph shows the data on an experiment of rearing flounder conducted using heavy hydrogen (H-2) which has the same properties as tritium (H-3).

(The heavy hydrogen concentration in seawater relative to the total number of hydrogen used in this experiment is about 4,000 ppm.)



## Status of marine organisms rearing test

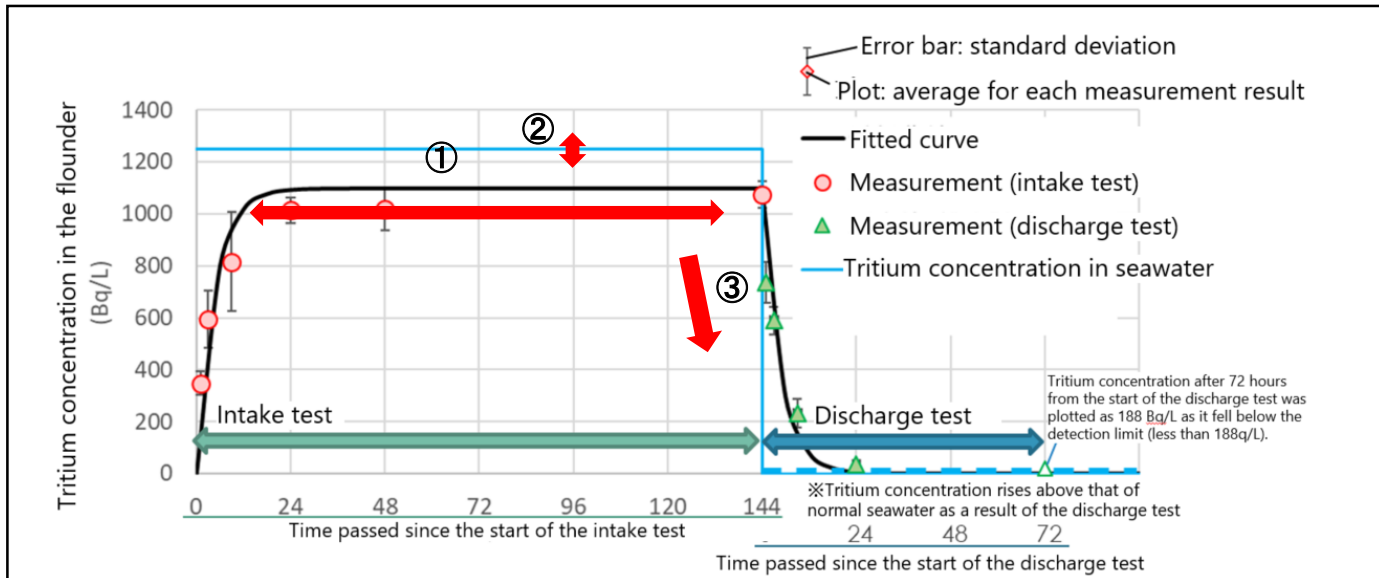
- Flounder, abalone and seaweed (e.g., Gulfweed), for which rearing know-how has been accumulated in Japan and which inhabit off the coast of Fukushima Prefecture have been selected for rearing.
- Since September 2022, the rearing has been ongoing while maintaining and improving the living environment by cleaning facilities and adding a water purification system.

We have also requested the cooperation of experts and others who have knowledge of rearing.

Test period	Before the discharge into the sea		After the discharge into the sea
Rearing environment	Normal seawater	ALPS treated water diluted with seawater	Water to be discharged in the environment
Tritium concentration	Approx. 0.1~1Bq/L	Less than 1,500Bq/L [TEPCO's operational standard for discharge]	Less than 1,500Bq/L
		Approx. 30Bq/L [The highest annual average concentration in the vicinity of the discharge outlet based on simulation results]	

# Results and insights of tritium concentrations in flounder

- We conducted intake tests in which flounder is put into a tank of ALPS treated water, and discharge tests in which flounder is put into a tank of normal seawater after a certain period of time, and measured time dependent tritium concentration
- The following results were observed same as previous knowledge
  - ① The tritium concentration **reaches an equilibrium after a certain period of time**
  - ② The tritium concentration **does not exceed that of the rearing environment**
  - ③ **The tritium concentration in the flounder is reduced as time passes** after the flounder, which had reached equilibrium in higher tritium concentrations than that of normal seawater, was returned to normal seawater
- The results for abalone and seaweed were consistent with the results for flounder. The OBT concentration in flounder will also be measured.



## Publicly available information on marine organisms rearing test

### ➤ **Rearing status**

Rearing Log (everyday), Rearing status/ Water quality status (every month), etc.

Marine organisms rearing test [Live Camera] (only in Japanese)



Rearing Log [Twitter] (only in Japanese)



### ➤ **Trends in tritium concentrations in marine organisms**

Marine organisms rearing test Website



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