

Nuclide Analysis Results of Fish and Shellfish (The Ocean Area Within 20km Radius of Fukushima Daiichi NPS)

[Categorized by the radioactive cesium level (by fish species, March - September)]

Total amount of radioactive cesium 134 and 137
Unit: Bq/kg (Raw)
Sampling period: March 29 - September 5, 2012
Guideline value (April 1, 2012 and later): 100Bq/kg

Fish	Maximum	Minimum	Number of measurements (Measurement results exceeding the guideline value)	Fish	Maximum	Minimum	Number of measurements
Greenling	25800	ND	70(38)	Chub mackerel	14.3	ND	2
Sebastes cheni	1880	540	6 (6)	Sand eel	12.9	ND	4
Barfin flounder	1670	690	2 (2)	Balloonfish	10.2	ND	2
Sea bass	1610	33	17 (11)	Pointhead flounder	8.3	4.1	2
Microstomus achne	1260	ND	35 (22)	Yellowtail	6.5	ND	5
Flatfish	1190	5.6	45 (27)	Pelagic thresher	6	—	1
Common Skete	1000	168	41 (41)	Korean flounder	4.8	ND	2
Marbled sole	920	21.3	38 (21)	Flathead flounder	4.1	—	1
Spotbelly rockfish	830	—	1 (1)	Zenopsis nebulosa	ND	—	1
Starry flounder	810	580	2 (2)	Alaska pollack	ND	—	1
Sea raven	670	25	7 (5)	Japanese butterfish	ND	—	1
Schlegel's black rockfish	620	410	4 (4)				
Banded dogfish	490	4.4	7(2)	Squids	Maximum	Minimum	Number of measurements
Stone flounder	390	29	9 (3)	Andrea cuttlefish	ND	—	5
Angel shark	222	66	3(2)	Loliginid	ND	—	9
Dasyatis matsubarae	205	ND	9 (2)	Loligo bleekeri	ND	—	3
Stingray	201	55	5(3)				
Flathead (Platycephalus sp.)	187	158	2 (2)	Octopuses	Maximum	Minimum	Number of measurements
Smooth dogfish	169	4.7	9(2)	Chestnutoctopus	9.1	ND	6
Acanthopagrus schlegeli	160	94	2(1)	Octopus (Enteroctopus) dofleini	7.7	ND	13
Drumfish	127	38	12(4)	Common octopus	ND	—	1
Sea robin	107	19.9	6(1)				
Pacific cod	107	16.7	11 (1)	Crustacea	Maximum	Minimum	Number of measurements
Littlemouth flounder	103	10	8 (1)	Blue crab	40	ND	13
Carcharhinus	93	4.6	5	Ovalipes punctatus	26	ND	16
Pennahia argentata	69	15	7				
Common Japanese conger	66	21.4	2				
Dory	63	12.5	9				
Roundnose flounder	57	4.5	7				
Lepidotrigla microptera	53	6.4	19				
Ridged-eye flounder	53	—	1				
Northern dogfish	50	ND	15				
Long shanny	47	16.4	3				
Lophius litilon	42	ND	17				
Common horse mackerel	38	10.7	5				
Pagrus major	38	ND	7				
Slippery sole	36	21.6	4				
Crimson sea bream	26	ND	3				
Salangichthys ishikawae	23	—	1				
Shark-skin flounder	17	ND	2				

Number of samples	59
Samples with cesium exceeding 100Bq/kg	24 (41%)
Number of measurements	546
Number of measurement results exceeding 100Bq/kg	204 (37%)

* Figures in parenthesis are ratios over 100 Bq/kg.

(Remark) ND for Cs134: approx. 3.1Bq/kg, Cs137: approx. 3.3Bq/kg

[Table 1 - 1. Results obtained at Each Measurement Point (1)]

Measurement Point (Date of Sampling)	Samples (Sample names in blue letters: 100Bq/kg or less)
T1 (May 17)	Marbled sole, Greenling, Pacific cod, Littlemouth flounder, Microstomus achne, Long shanny, Sea bass, Lepidotrigla microptera, Flatfish, Lophius litilon, Roundnose flounder, Northern dogfish, Andrea cuttlefish, Loliginid, octopus (Enteroctopus) dofeini, Chestnutoctopus, Loligo bleekeri, Stone flounder
T1 (May 30)	Pacific cod, Greenling, Flatfish, Marbled sole, Common horse mackerel, Microstomus achne, Lepidotrigla microptera, Pennahia argentata, Dory, Lophius litilon, Chestnutoctopus, Loliginid, Andrea cuttlefish, Littlemouth flounder, Stone flounder, Common Skete
T1 (June 14)	Greenling, Microstomus achne, Lophius litilon, Flatfish, Lepidotrigla microptera, Common horse mackerel, Octopus (Enteroctopus) dofeini, Chestnutoctopus
G1 (August 28)	Stone flounder, Marbled sole, Microstomus achne, Lepidotrigla microptera, Dory, Crimson sea bream
T2 (May 17)	Greenling, Flatfish, Northern dogfish, Marbled sole, Littlemouth flounder, Slippery sole, Microstomus achne, Sea raven, Pacific cod, Common Japanese conger, Long shanny, Roundnose flounder, Lepidotrigla microptera, Chestnutoctopus, Korean flounder, Lophius litilon, Flathead flounder, Pointhead flounder, Loliginid, Octopus (Enteroctopus) dofeini, Loligo bleekeri
T2 (May 30)	Pacific cod, Greenling, Long shanny, Lepidotrigla microptera, Marbled sole, Slippery sole, Microstomus achne, Lophius litilon, Common horse mackerel, Pointhead flounder, Octopus (Enteroctopus) dofeini, Loliginid, Korean flounder, Chestnutoctopus, Common Octopus, Andrea cuttlefish
T2 (June 14)	Sea raven, Microstomus achne, Flatfish, Lepidotrigla microptera, Greenling, Lophius litilon, Littlemouth flounder, Common horse mackerel, Loliginid, Chestnutoctopus, Marbled sole
T2 (August 28)	Dory, Marbled sole, Crimson sea bream, Lepidotrigla microptera, Smooth dogfish, Balloonfish, Littlemouth flounder, Greenling
T3 (May 10)	Lepidotrigla microptera, Shark-skin flounder, Microstomus achne, Sea robin, Loliginid, Octopus (Enteroctopus) dofeini, Common Japanese conger, Marbled sole, Pacific cod, Roundnose flounder, Loligo bleekeri, Greenling, Flatfish, Common Skete
T3 (June 4)	Dasyatis matsubarae, Microstomus achne, Stone flounder, Marbled sole, Roundnose flounder, Lepidotrigla microptera, Lophius litilon, Pagrus major, Octopus (Enteroctopus) dofeini, Greenling, Common Skete, Flatfish
T3 (July 9)	Marbled sole, Stone flounder, Littlemouth flounder, Slippery sole, Dory, Lepidotrigla microptera, Lophius litilon, Octopus (Enteroctopus) dofeini, Greenling, Common Skete, Flatfish, Microstomus achne
T3 (August 20)	Microstomus achne, Stone flounder, Greenling, Lepidotrigla microptera, Dory, Lophius litilon, Flatfish, Common Skete
T4 (May 21)	Microstomus achne, Littlemouth flounder, Roundnose flounder, Sea bass, Pacific cod, Lophius litilon, Lepidotrigla microptera, Loliginid, Octopus (Enteroctopus) dofeini, Common Skete, Greenling, Marbled sole
T4 (June 18)	Flatfish, Lepidotrigla microptera, Crimson sea bream, Dory, Lophius litilon, Roundnose flounder, Octopus (Enteroctopus) dofeini, Loliginid, Northern dogfish, Andrea cuttlefish, Common Skete, Greenling, Marbled sole, Microstomus achne
T4 (July 9)	Littlemouth flounder, Flatfish, Slippery sole, Lepidotrigla microptera, Common Skete, Marbled sole
T4 (August 20)	Marbled sole, Dory, Flatfish, Stone flounder, Lepidotrigla microptera, Smooth dogfish, Zenopsis nebulosa, Lophius litilon, Pagrus major, Common Skete, Greenling, Microstomus achne
G1 (June 6)	Acanthopagrus schlegeli, Flatfish, Drumfish, Banded dogfish, Ovalipes punctatus, Blue crab, Sea bass, Schlegel's black rockfish, Stingray, Common Skete
G1 (July 4)	Greenling, Marbled sole, Drumfish, Stingray, Pennahia argentata, Banded dogfish, Yellowtail, Sea bass, Common Skete, Acanthopagrus schlegeli, Flatfish
G1 (August 1)	Drumfish, Flatfish, Sea bass, Carcharhinus, Blue crab, Greenling, Common Skete, Stingray
G1 (September 5)	Flatfish, Drumfish, Blue crab, Common Skete, Stingray, Angel shark

[Table 1 - 2. Results obtained at Each Measurement Point (2)]

Measurement Point (Date of Sampling)	Samples (Sample names in blue letters: 100Bq/kg or less)
G2 (June 6)	Drumfish, Marbled sole, Northern dogfish, Lophius litilon, Blue crab, Ovalipes punctatus, Starry flounder, Sea bass, Common Skete, Flatfish
G2 (July 4)	Flatfish, Marbled sole, Common horse mackerel, Pagrus major, Ovalipes punctatus, Yellowtail, Octopus (Enteroctopus) dofleini, Common Skete, Microstomus achne, Greenling
G2 (August 1)	Dasyatis matsubarae, Pagrus major, Smooth dogfish, Northern dogfish, Banded dogfish, Marbled sole, Ovalipes punctatus, Blue crab, Common Skete, Flatfish
G2 (September 5)	Dasyatis matsubarae, Flatfish, Drumfish, Dory, Carcharhinus, Ovalipes punctatus, Blue crab, Chub mackerel, Sebastes cheni, Common Skete
G3 (May 25)	Greenling, Barfin flounder, Common Skete, Microstomus achne, Schlegel's black rockfish, Marbled sole, Dasyatis matsubarae, Flatfish, Drumfish
G3 (June 27)	Drumfish, Ovalipes punctatus, Smooth dogfish, Greenling, Microstomus achne, Common Skete, Marbled sole, Flatfish, Sea bass
G3 (July 18)	Marbled sole, Pagrus major, Blue crab, Ovalipes punctatus, Yellowtail, Northern dogfish, Dasyatis matsubarae, Schlegel's black rockfish, Microstomus achne, Common Skete, Flatfish, Greenling
G3 (August 8)	Drumfish, Pagrus major, Smooth dogfish, Blue crab, Carcharhinus, Microstomus achne, Common Skete, Flatfish, Sea bass
G4 (May 25)	Pennahia argentata (Including drumfish), Sea robin, Sea bass, Lophius litilon, Ovalipes punctatus, Northern dogfish, Sebastes cheni, Common Skete, Sea raven, Microstomus achne, Greenling, Marbled sole, Flatfish
G4 (June 27)	Sea robin, Dory, Ovalipes punctatus, Octopus (Enteroctopus) dofleini, Yellowtail, Lophius litilon, Japanese butterfish, Microstomus achne, Common Skete, Greenling, Flatfish, Marbled sole, Sea bass
G4 (July 18)	Dasyatis matsubarae, Flatfish, Sea robin, Northern dogfish, Microstomus achne, Common Skete, Marbled sole, Sea bass, Greenling
G4 (August 8)	Chub mackerel, Pagrus major, Ovalipes punctatus, Sebastes cheni, Microstomus achne, Greenling, Banded dogfish, Flatfish, Dasyatis matsubarae
G5 (May 2)	Lepidotrigla microptera, Marbled sole, Sebastes cheni, Flatfish, Sea raven, Microstomus achne, Common Skete, Greenling
G5 (June 16)	Pennahia argentata, Common Skete, Microstomus achne, Marbled sole, Greenling, Flatfish
G5 (July 15)	Pennahia argentata, Banded dogfish, Sebastes cheni, Greenling, Common Skete, Microstomus achne, Flatfish, Marbled sole
G5 (August 11)	Ovalipes punctatus, Blue crab, Pelagic thresher, Carcharhinus, Common Skete, Angel shark, Flatfish
G6 (March 29)	Sand eel
G6 (April 7)	Northern dogfish, Pacific cod, Shark-skin flounder, Flatfish, Marbled sole, Sea raven
G6 (April 11)	Northern dogfish, Marbled sole, Microstomus achne, Common Skete, Pacific cod
G7 (June 25)	Sea bass, Greenling, Marbled sole, Common Skete, Flatfish, Smooth dogfish, Drumfish
G7 (July 15)	Sea bass, Flatfish, Blue crab, Banded dogfish, Dasyatis matsubarae, Barfin flounder, Greenling, Common Skete, Microstomus achne, Marbled sole, Drumfish
G7 (August 11)	Flatfish, Angel shark, Blue crab, Ovalipes punctatus, Common Skete, Sea bass, Smooth dogfish
G8 (July 23)	Smooth dogfish, Yellowtail, Northern dogfish, Dasyatis matsubarae, Common Skete, Microstomus achne, Marbled sole, Flathead (Platycephalus sp.), Flatfish, Sea robin
G8 (August 25)	Carcharhinus, Smooth dogfish, Sea robin, Common Skete, Microstomus achne, Marbled sole, Flatfish, Flathead (Platycephalus sp.)

[Additional sampling of greenling (G1)]

August 29	Below the guideline value: 12, Above the guideline value: 3
August 30	Below the guideline value: 4, Above the guideline value: 4
September 4	Below the guideline value: 1, Above the guideline value: 3
September 5	Below the guideline value: 6, Above the guideline value: 4

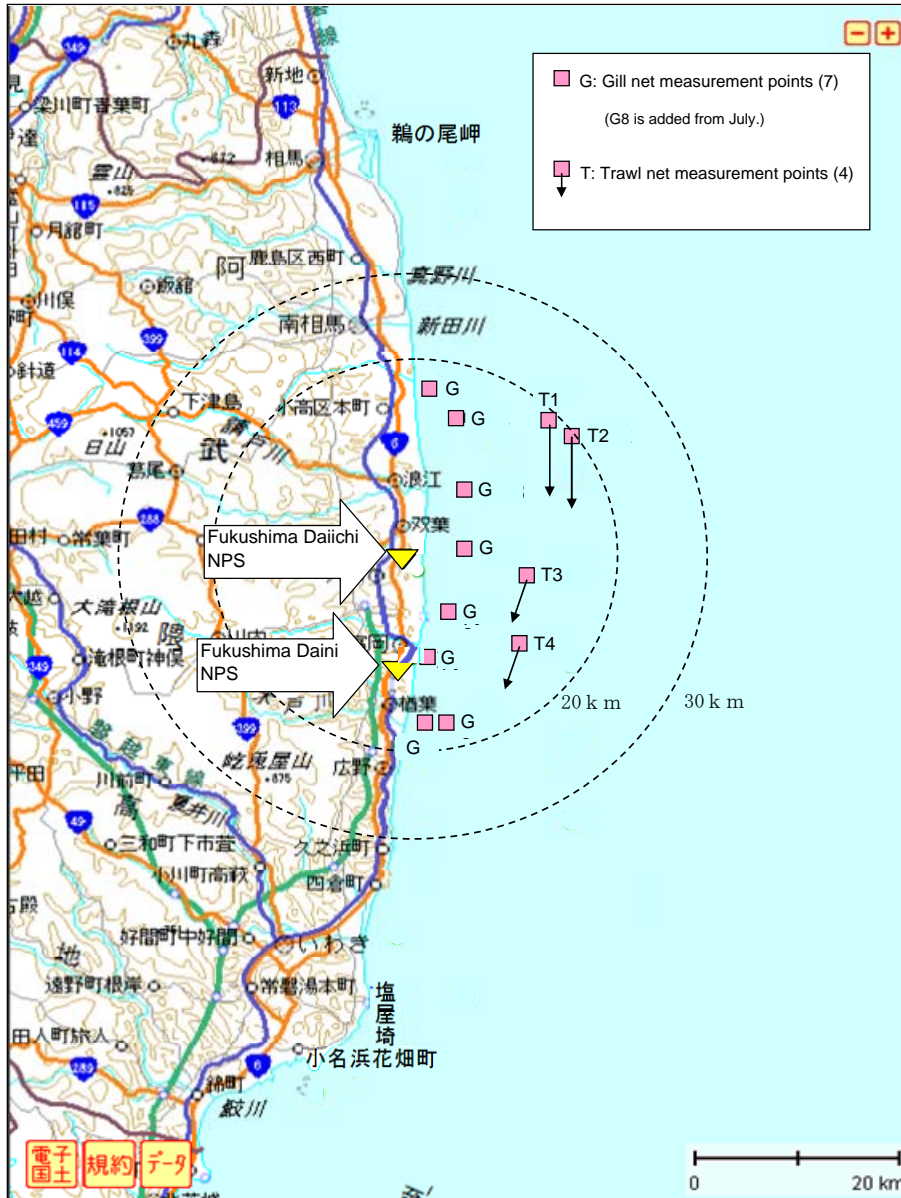
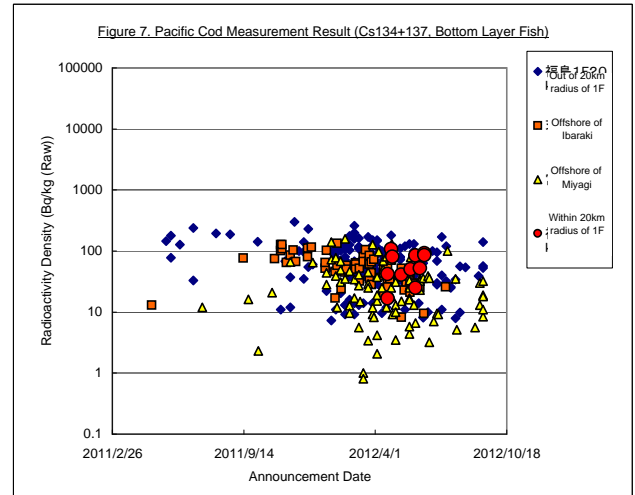
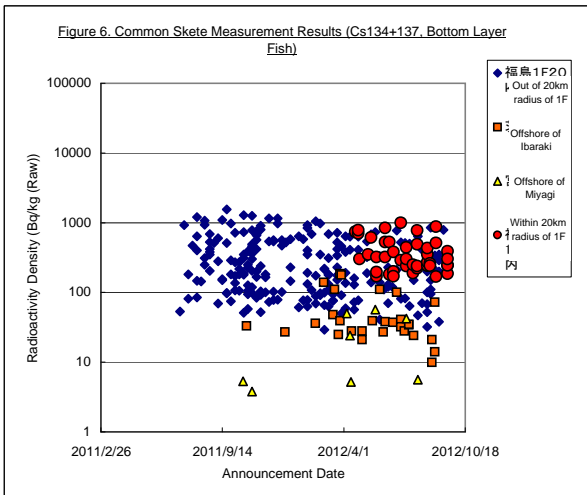
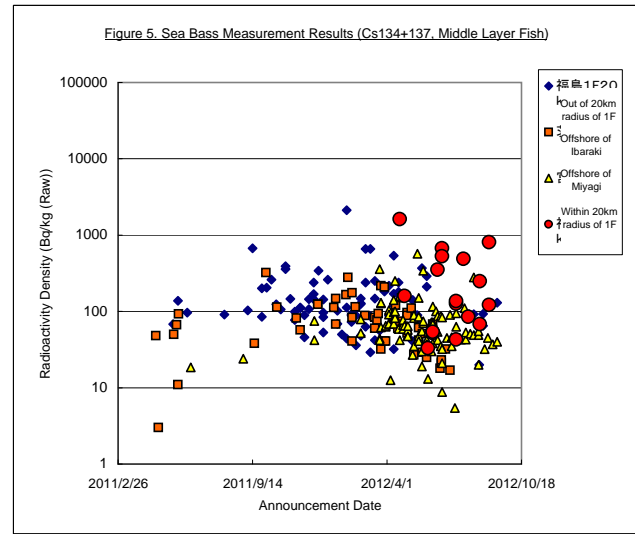
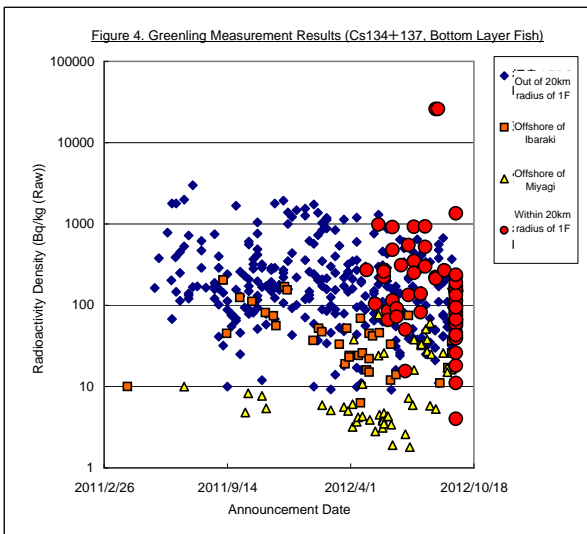
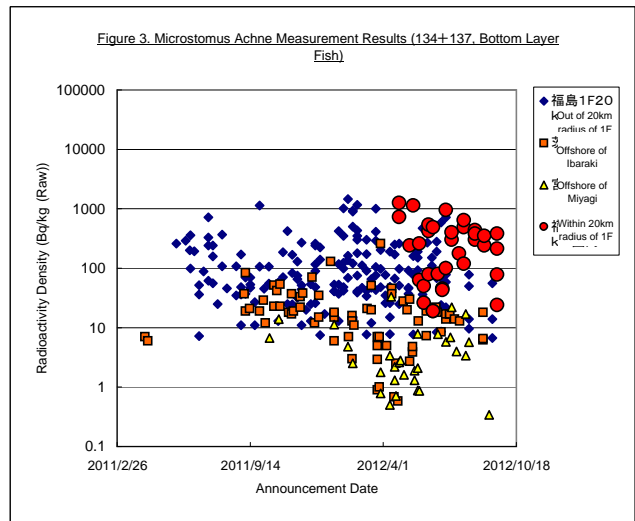
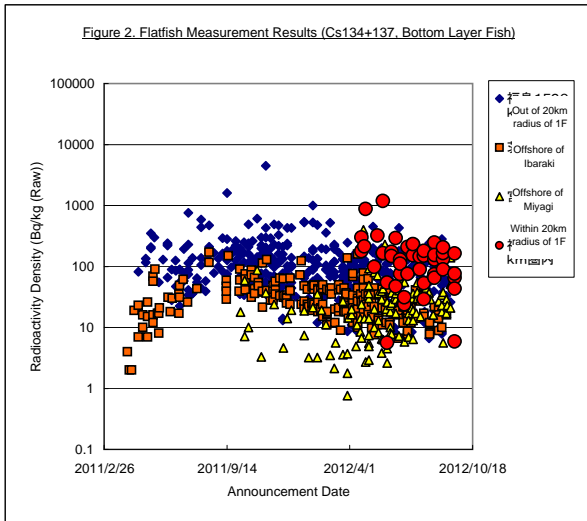


Figure 1. Fish and Shell Fish Measurement Points (As of September 2012)



(Remark) The measurement results of "Out of 20km radius of 1F", "Offshore of Ibaraki" and "Offshore of Miyagi" was obtained from the Japan Meteorological Agency website.

Results of Additional Sampling of Greenling (Preliminary Report)

Greenling, seawater, marine soil and bait organisms were sampled in 2km square ocean area around 1km offshore of Ota River (G1). (Results provided for 3 out of 4 weeks of scheduled sampling)

1. Greenling

(1) Number of samples (near G1): Total of 52

Sampling date	Aug. 29	Aug. 30	Sep. 4	Sep. 5	Sep. 11	Sep. 12
Number of samples	15	8	4	10	10	5

(2) Radioactive cesium density (Measured one sample at a time, data acquired up until September 12)
Below the detection limit - 1350Bq/kg (Raw), Average: 117Bq/kg (Raw)

(Reference)

- The maximum cesium density detected in greenling sampled within the 20km range from 1F: 980Bq/kg (Raw) (May 2, G5)
- Detection limits: Cs-134: 8.2Bq/kg (Raw), Cs-137: 8.7Bq/kg (Raw)

2. Radioactive cesium density of seawater

Number of times sampled: 3 (August 29, September 4 and 11 near G1): Under analysis

(Reference)

- Radioactive cesium density around 1km offshore of Ota River: 0.03-0.07Bq/L (July 31, 2012)

3. Radioactive cesium density of marine soil

Sampling locations: 15 (August 29, September 4 and 11 in 2km square ocean area near G1): Under analysis

(Reference)

- Radioactive cesium density in the coast north of 1F (Offshore of Ukedo and Soma): 17-530Bq/kg (Dry soil) (July 27, 2012)

4. Bait organisms

Sampling conducted

August 30: 3 crabs (Carapace length: Approx. 1cm) [Gill net]

September 4: 3 crabs (Carapace length: Approx. 1cm) and a small number of polychaeta [Bottom sampler]

September 11: Small numbers of polychaeta and shellfish [Bottom sampler]

From next time, sampling will be done using trawl net for gathering bait organisms considering the small number of samples.

End