

Cruise report of the sighting and satellite tagging survey for common minke whales in the sub-area 7 in 2011

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ABSTRACT

The sighting and satellite tagging survey for common minke whales was conducted from 25 April to 8 June in 2011 in the western North Pacific in sub-area 7, where the closing mode survey was conducted with predetermined track lines. The research area was set in the waters off Pacific side of northern Japan, north of 35°N and west of 150°E. The research vessel Shunyo-maru was engaged for this survey. During the searching of track lines of 1160.8 n.miles, two schools (two animals) of common minke whale, eight (11) of Bryde's whale, one (one) of fin whale, two (three) of humpback whale, and seven (13) of sperm whale were encountered. Among two individuals of common minke whales sighted, only one individual was targeted for tagging of the satellite tags (Argos transmitter), but the tag could not be successfully attached on it. Few encounters of common minke whales may be attributed to insufficient allocation of searching effort in the coastal waters and anomalous condition of the ocean caused by the earthquake and tsunami. Such a small number of sightings appear not to be suitable for estimating abundance of common minke whale.

KEYWORDS: COMMON MINKE WHALE, NORTH PACIFIC, SIGHTING SURVEY, SATELLITE TAGGING

INTRODUCTION

In 2010, sighting and satellite tagging survey for common minke whale was conducted in the coastal waters off Kushiro, southeastern coast of Hokkaido, northern Japan, in autumn season from 6 September to 4 October (Kishiro and Miyashita, 2011). During this cruise, the satellite tag was attached on one common minke whale, and its movement was tracked for a period of 27 days (Kishiro and Miyashita, 2011). This was the first result of the satellite tracking of common minke whale in the western North Pacific, and provided valuable information about the residence time and movements of the species in that area. However, sample size was too small, and tracking period was short to investigate the migratory routes of the species.

Information about individual migration is important for investigating the stock structure of the common minke whale. In addition, information of the current abundance in the Pacific coast off northern Japan in spring season is important for the trial implementation of RMP procedure in the western North Pacific (IWC, 2010). To obtain such information, we

planned to conduct the sighting and satellite tagging survey for common minke whales in sub-area 7 in the western North Pacific, in 2011 spring season (Kishiro, et.al. 2011).

The present report summarizes the results of the survey cruise conducted in sub-area 7 from 25 April to 8 June in 2011.

SURVEY DESIGN AND METHODS

Research area and track line

Research area was set in the waters off Pacific side of northern Japan, north of 35°N and west of 153°E (sub area 7, determined by the IWC), except for the Russian EEZ. The survey area was further divided into the four blocks: CN, CS, W, and E (Fig. 1). A total research distance of the predetermined track lines was 2,409.5 n.miles.

Research vessel

The research vessel engaged in the survey was Syunyo-maru (887 GT), which was equipped with a top barrel. Number of crew on vessel was 24. The vessel belongs to the Fisheries Research Agency of Japan.

Sighting methods

The normal closing mode survey was carried out. Under this survey mode, the vessel approached all the cetacean schools encountered on the track lines. Two observers searched whales from the top barrel by naked eyes. Species identification was conducted using binocular. At least one researcher searched for cetaceans from the upper-bridge and recorded sighting information. The survey was conducted from 6:00 a.m. to 6:00 p.m. basically when the weather conditions were suitable for observations: visibility better than 1.5 nautical miles and the wind speed less than 7.5m/s. The vessel speed was set to 11.5 knots with slight adjustment to reduce hull vibration.

Satellite tagging

Basically, all common minke whales encountered were targeted for tagging. The Wildlife Computers Spot-5 implantable tags were used as the Argos transmitter. A handy air gun was used for the attachment of the tags. The tagging dart system and methods of the attachment were followed to the methods described by Kishiro and Minamikawa, 2006; Kishiro and Miyasita, 2011. The filling pressure of the gun was set to 110kgf/cm², and the firings of the air gun for attachment were made from the forecastle deck when the vessel could adequately approach the whale during the chasing. The time for chasing was limited to a maximum of 120 minutes against one animal.

Other experiments

The training and experiment for estimating angle and distance were conducted. When gray, humpback, North Pacific right, and killer whales were sighted, photographs were taken for individual identification. A Conductivity-Temperature-Depth (CTD) profiler cast was conducted to obtain information on the oceanographic condition. Echo-

sonder survey was conducted on the track lines in the CN block. Marine debris probably generated by the earthquake and tsunami that struck Japan in March 2011 was recorded during the surveys in the block CN, CS and W.

CRUISE SUMMARY

Scientists and observer onboard

Scientists: Toshihide Iwasaki (Senior scientist, NRIFSF, first half of the survey)

Yu Kanaji (Senior scientist, NRIFSF, second half of the survey)

Saeko Kumagai (Scientist, NRIFSF, entire period)

Narrative

25 April: The vessel left Shimizu port, Shizuoka Prefecture, for the first half of the cruise.

27 April–6 May: The sighting survey, angle and distance training, and CTD casting were conducted in the block CN.

7–14 May: The sighting survey and CTD casting were conducted in the block CS.

15 May: The vessel entered the Yokohama port, Kanagawa Prefecture, for refueling.

17 May: The vessel left Yokohama port for the latter half of the cruise.

18–19 May: The sighting survey and CTD casting were conducted in the block CS.

20–27 May: The sighting survey and CTD casting were conducted in the block W.

28 May –1 June: The vessel left the survey area in order to seek refuge from an impending typhoon.

2–5 June: The sighting survey, angle and distance experiment, and CTD casting were conducted in the block W.

8 June: The vessel arrived at the Shimizu port.

SURVEY RESULTS

Sighting results

All the 1,160.8 n.miles of track lines was searched. The coverage was 48.2 % of the predetermined lines. It took substantial time to survey the blocks, CN and CS, and W, owing to bad weather conditions and refuge from typhoon. As a result, none of the track lines set in offshore block E was searched.

During the searching including additional transit cruise, two schools (two animals) of common minke whale, eight (11) of Bryde's whale, one (one) of fin whale, two (three) of humpback whale, and seven (13) of sperm whale were encountered (Table 1). Among two sightings of common minke whales, one was sighted in the coastal waters off southwestern Hokkaido close to the way point No. 5 in the block CN, and the other was sighted in the waters off northeastern Honshu close to the way point No. 12 in the block CS (Fig. 2). Sightings of Bryde's whales were

distributed in offshore waters in the block W (Fig. 3). A sighting of fin whale was distributed in the coastal block CS (Fig. 4), whereas sightings of humpback whales were in the offshore block W (Fig. 5). Sperm whales were detected both in the blocks CS and W (Fig. 6).

Satellite tagging

Among two individuals of common minke whales sighted during the survey, the first individual was targeted for tagging of the satellite tags, but we lost sight of it after 37 minutes chasing. The second individual was not targeted for tagging, because it dived soon after initial detection and we lost sight of it.

Other experiments

A humpback whale was targeted for photo-id research. Examination of digital image of fluke of the animal indicated no re-sightings. Total 18 CTD casts were taken.

Marine debris generated by the earthquake and tsunami was sighted over a wide range in the survey area (Fig. 7). Sightings of derelict fishing gears and other debris were concentrated in northern and middle parts of the blocks CS and W, while those of derelict fishing boats were recorded in the block CS. Relatively few sights of marine debris were recorded in the block CN and southern parts of the blocks CS and W.

DISCUSSION

Unfortunately no whales were tagged during this survey. There were few chances to attach the satellite tags because of relatively few sighting of common minke whales. The possible reasons for few encounters of common minke whales are twofold. First, sufficient searching efforts could not be allocated in the coastal waters. In the previous sighting surveys conducted in spring months, many schools of common minke whale were sighted in the coastal waters around the Sendai Bay (Miyashita, 2009), while relatively few schools were sighted in the offshore waters (Nishiwaki and Tsunekawa, 2004). Nevertheless, in this survey, the track lines were almost equally spaced in both coastal and offshore blocks to cover the entire sub-area 7. Second, the condition of the ocean was anomalous due to the earthquake and tsunami. During the survey period, aftershocks occurred so many times (Fig. 8) and a lot of debris was distributed in the survey area. Detection of common minke whale is usually triggered by brief surfacing, which is hard to detect. Therefore, marine debris might significantly disturb to search whales. At the same time, perpetual aftershocks might drive off minke whales. Although one of the primary objectives of this survey was to obtain information about abundance of common minke whale, such a small number of sighting data would not be suitable for estimating abundance.

ACKNOWLEDGMENTS

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Table 1. Summary of cetacean sightings made during the sighting and satellite tagging survey for common minke whales in the sub-area 7 in 2011.

	Primary sights		Secondary sights		Total	
	Number of schools	Number of individuals	Number of schools	Number of individuals	Number of schools	Number of individuals
Common minke whale	2	2	0	0	2	2
Bryde's whale	5	8	3	3	8	11
Fin whale	0	0	1	1	1	1
Humpback whale	1	1	1	2	2	3
Sperm whale	4	9	3	4	7	13

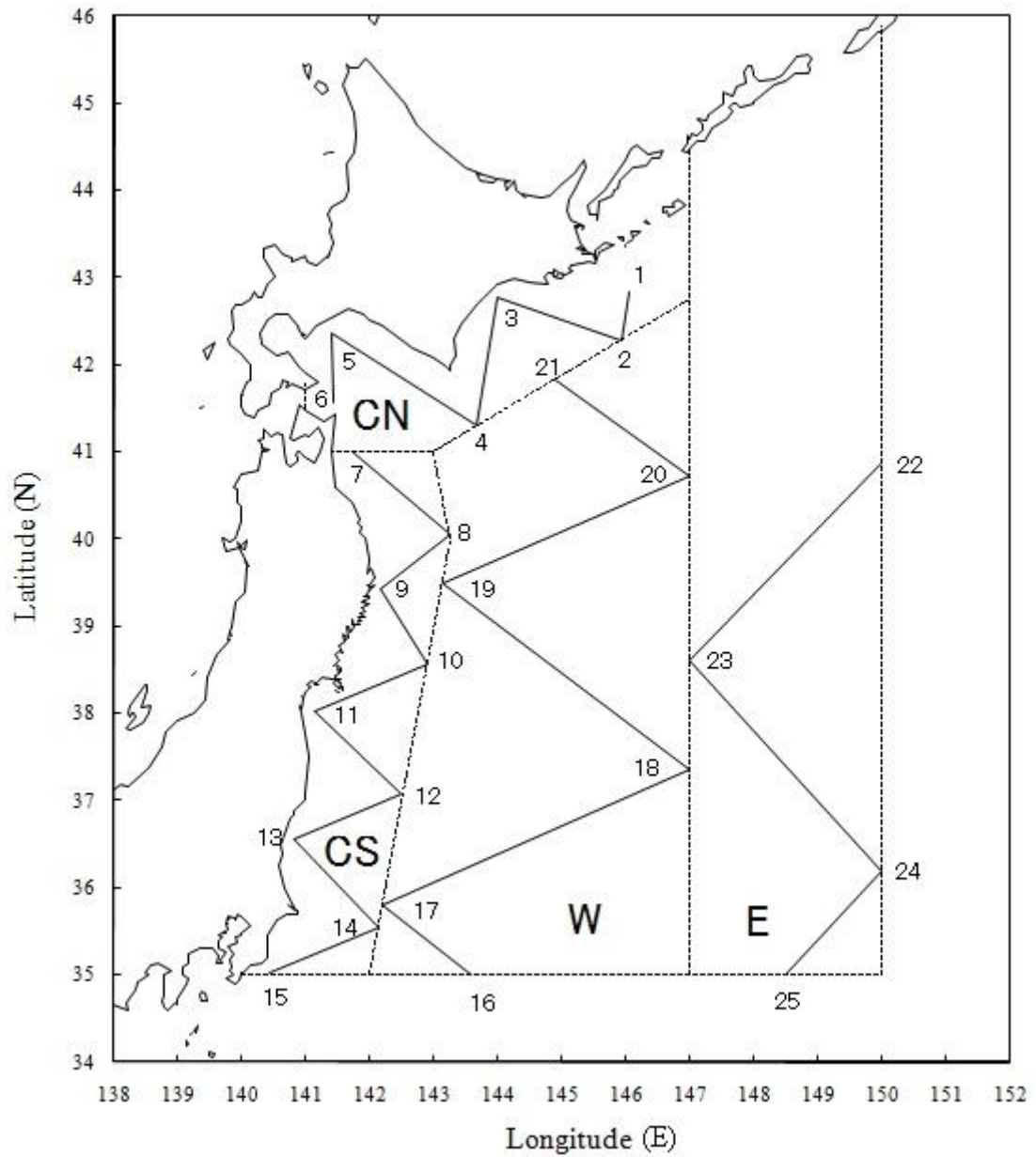


Fig. 1. Research area (dotted line) and pre-determined track line for *Shunyo-maru* in 2011.

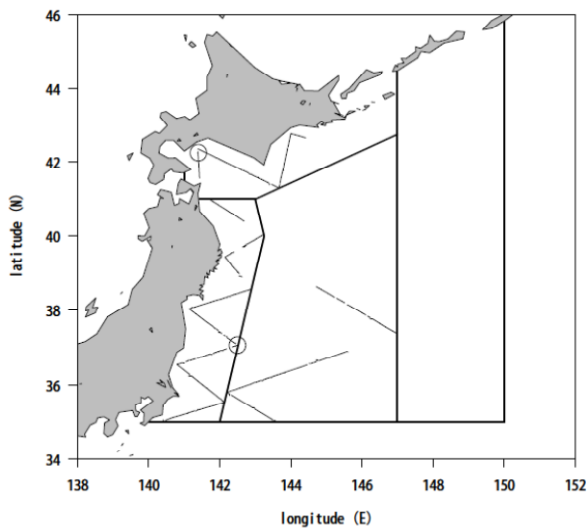


Fig. 2 Survey tracks and sighting positions of common minke whale schools during surveys (open circle: primary sighting).

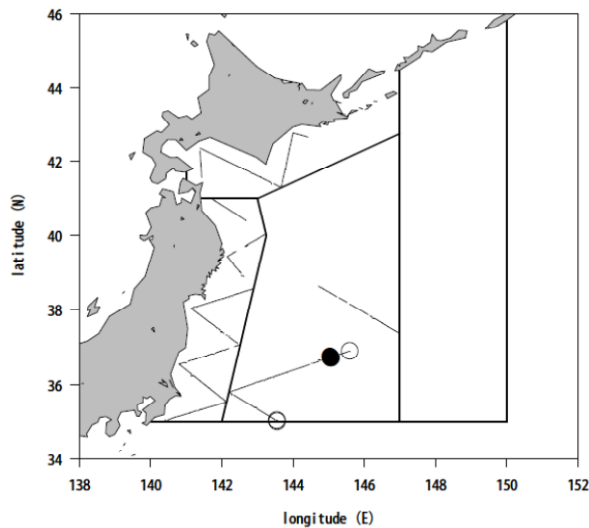


Fig. 3 Survey tracks and sighting positions of Bryde's whale schools during surveys (open circle: primary sighting; solid circle: secondary sighting).

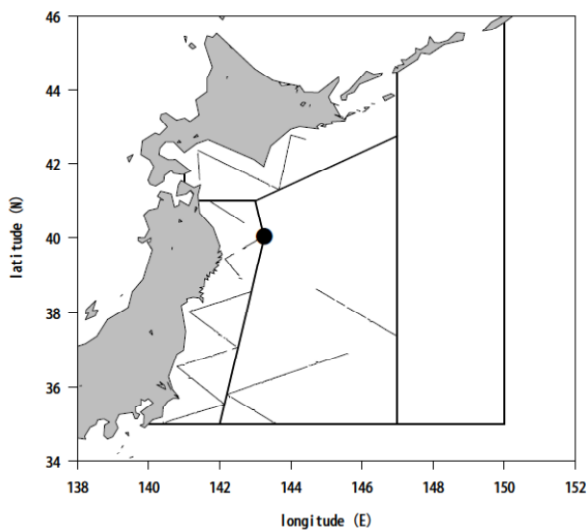


Fig. 4 Survey tracks and sighting position of fin whale school during surveys (solid circle: secondary sighting).

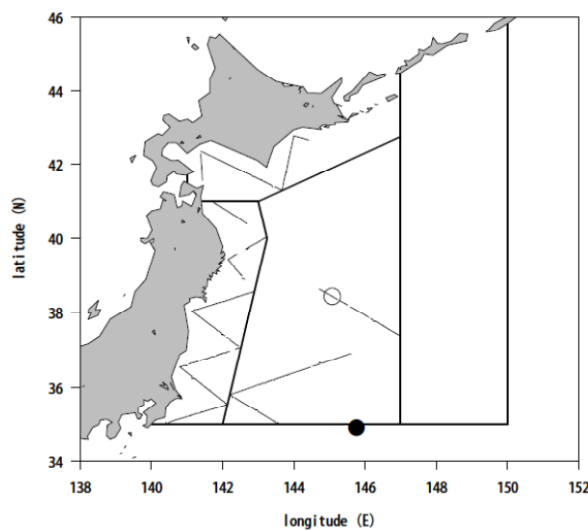


Fig. 5 Survey tracks and sighting positions of humpback whale schools during surveys (open circle: primary sighting; solid circle: secondary sighting).

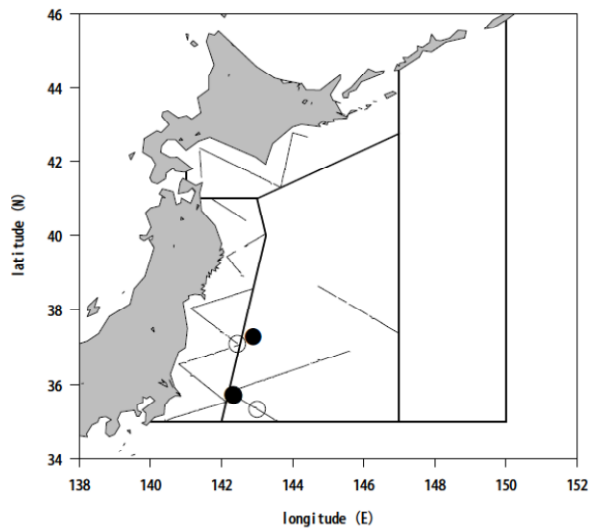


Fig. 6 Survey tracks and sighting positions of sperm whale schools during surveys (open circle: primary sighting; solid circle: secondary sighting).

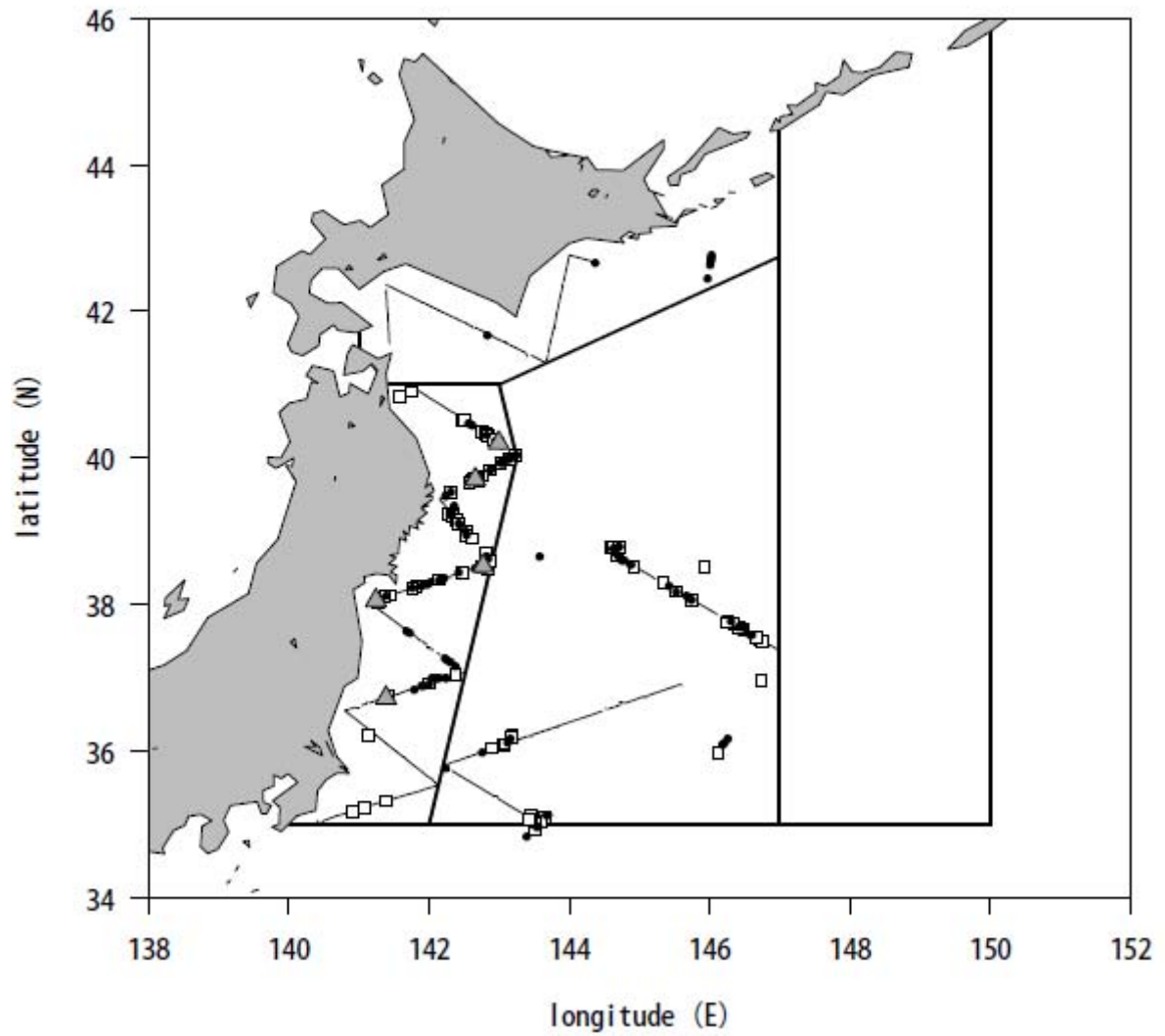


Fig. 7 Sighting positions of marine debris generated by the earthquake and tsunami that struck Japan in March 2011 (grey triangle: derelict fishing boat; white square: derelict fishing gear; black dot: other debris).

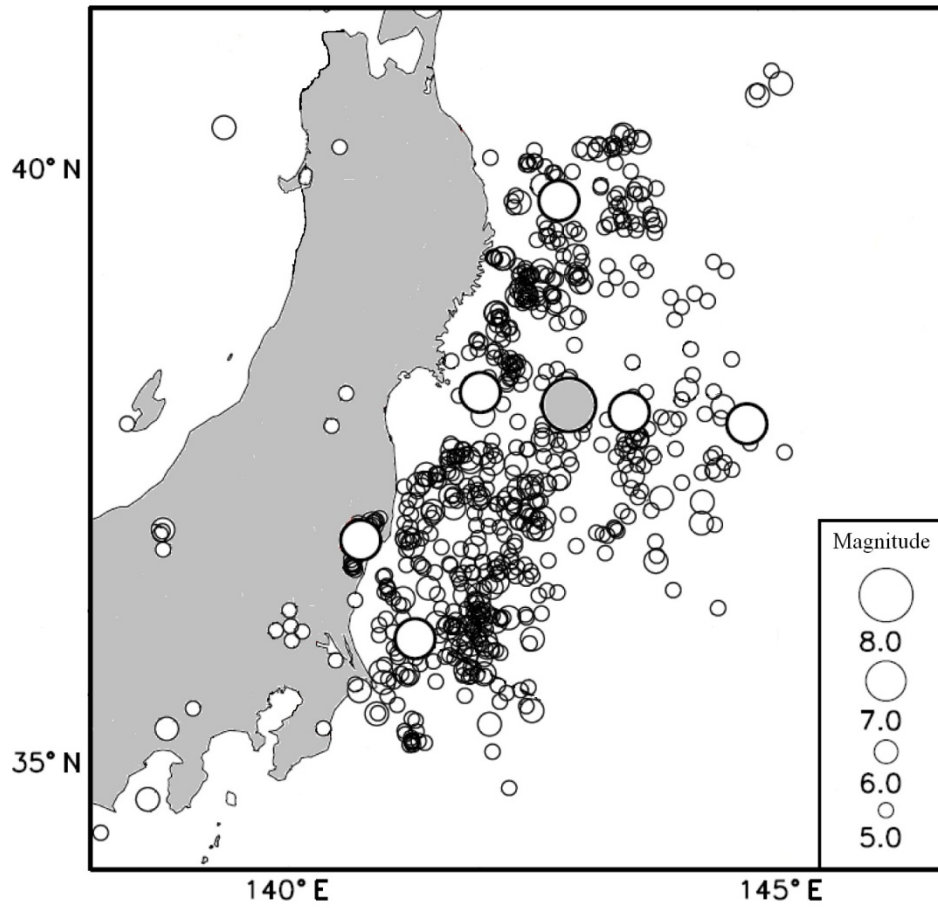


Fig. 8. Distribution of the seismic center of the earthquake occurred in 11 March 2011 (grey circle, magnitude 9.0) and its aftershock (open circle) occurred in the period including the sighting survey periods. (after the Japan Meteorological Agency, 2012).