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INTERNATIONAL WHALING COMMISSION

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ABSTRACT

A plan of sighting survey for common minke whales in the Okhotsk Sea including the Russian EEZ (sub-area 12NE) was presented to the 65b/IWC/SC (Kishiro et al. 2014). However, because of a logistical problem, the actual survey was conducted in the Japanese waters in the sub-area 7CN (Pacific coast off Hokkaido, northern Japan), 10E (coastal waters off Hokkaido in the Sea of Japan), and 11(coastal waters off Hokkaido in the Okhotsk Sea) as substitution of the plan. During the periods from 28 August to 12 September, two research vessels (*Shonan-maru No.2* in the 7CN, and *Shunyo-maru* in the 10E and 11) engaged the normal closing sighting surveys. Searching distance was 614.6 n. miles in the 7CN, 712.2 n. miles in the 10E, and 262.6 n. miles in the 11, respectively. A total of 34 schools/40 individuals of common minke whales (6/6 in the 7CN, 9/10 in the 10E, and 19/24 in the 11), 7 schools/19 individuals of fin whales (1/2 in the 7CN, 2/2 in the 10E, and 4/15 in the 11), and 3 schools/5 individuals of sperm whales (only in the 7CN) were sighted. These results provide information on the migration and abundance of the whales in those waters in summer season, and will contribute to the future assessment of the North Pacific common minke whales.

INTRODUCTION

In the last year's the IWC/SC meeting, we presented the research plan for the sighting survey of common minke whales in the Okhotsk Sea including the Russian EEZ (sub-area 12NE) in 2014 summer season to obtain the information on stock structures and abundance of common minke whales (Kishiro *et al*., 2014). The IWC/SC welcomed the plan given there have been no surveys in sub-area 12 (the Okhotsk Sea) in recent years, and the importance of abundance estimates for sub-area 12 to the understanding of the status of common minke whales in the western North Pacific (IWC, 2015).

Following the research plan, two research vessels (*Shonan-maru No.2* and *Shunyo-maru*) departed from the Japanese ports on 7 and 8 August for the research area, respectively, and the Government of the Russian Federation kindly provided the permission for entering sub-area 12NE (the Russian EEZ) on 11 August.

However, a logistical problem regarding the permission was revealed when they entered in the Russian waters, and vessels came back to the Japanese waters. After that, the actual survey was conducted in the Japanese waters in the sub-area 7CN (Pacific coast off Hokkaido, northern Japan), 10E (coastal waters off Hokkaido in the Sea of Japan), and 11(coastal waters off Hokkaido in the Okhotsk Sea) as substitution of the plan.

The present report summarizes the results of those substitute surveys conducted by *Shonan-maru No.2* and *Shunyo-maru* in sub-area 7CN, 10E, and 11 from 28 August to 12 September 2014.

SURVEY DESIGN AND METHODS

Research area and track line

Survey area was initially set in the Okhotsk Sea (sub-area 12NE) in the Russian waters (Fig. 1). However, the survey area was changed to the Japanese domestic waters of the Okhotsk Sea (sub-area 11), Sea of Japan (10E) and the Pacific coast off Hokkaido (7CN) (Fig. 2) because of the logistical problem. All of those three sub-areas have both the Russian and Japanese waters. To carry out the surveys in only the Japanese waters, research block (area surrounded by the dotted lines and coast lines in Fig. 2) was set in each sub-area. The pre-determined track line was set in each block by using a software, DISTANCE (Thomas et al., 2010). Distance of the pre-determined track line in each area was 738.4 n.miles for sub-area 7CN, 800.4 n.miles for sub-area10E, and 401.2 n. miles for sub-are 11. Sub-area 7CN was covered by *Shonan-maru No.2* while sub-area 10E to 11 was covered by *Shunyo-maru*.

Research vessels

Following two research vessels engaged the surveys.

Shonan-maru No.2 (hereinafter referred as *SM2*; 712GT, 5,500HP)

The vessel was equipped with a top barrel. Number of crew on vessel is 17. The vessel was chartered by the Fisheries Research Agency.

Shunyo-maru (hereinafter referred as *SHU*; 887GT, 4,000HP)

The vessel was equipped with a top barrel. Number of crew on vessel is 25. The vessel belongs to the Fisheries Research Agency.

Scientists and observers on board

SM2 : Hiroto Murase (Senior scientist, NRIFSF)

Saeko Kumagai (Scientist, NRIFSF)

Riabov Andrei (Russian observer, Chukot TINRO)

SHU :Toshiya Kishiro (Senior scientist, NRIFSF)

Keiko Sekiguchi (Scientist, NRIFSF)

Azusa Kamiyama (Scientist, NRIFSF, second half of the cruise)

Ivan Istomin (Russian observer, VNIRO)

Narrative of the substitute surveys

SM2 : 8 August: The vessel left Shiogama port, Miyagi Prefecture.

1 September: The sighting survey was started at the way point 1 in sub-area 7CN.

7 September: The survey was finished at the way point 8 in sub-area 7CN.

8 September: The vessel arrived at Shiogama port.

SHU : 7 August: The vessel left Shimizu port, Shizuoka Prefecture.

28 August: The sighting survey was started at the way point 1 in sub-area 11.

31 August: The survey in sub-area 11 was finished, and vessel moved to sub-area 10E.

1 September: The survey was started at the way point 11 in sub-area 10E.

12 September: The survey in sub-area 10E was finished.

16 September: The vessel arrived at Shimizu port, Shizuoka Prefecture.

Sighting methods

Sighting survey was conducted following the guideline provided by the IWC for the purpose of RMP (IWC, 2012). The normal closing mode survey was carried out, in which closing was made for all cetacean species encountered within 3 n.miles of the track lines (both side). Two observers on the top barrel of the vessel conduct searching by using 7×50 binoculars with reticule and the sighting angle with reference to the course of the vessel was estimated using an angle board installed in the barrel. The researchers on the upper-bridge also searches for cetaceans and record sighting information. Because no IO booth was equipped on the survey vessels, IO mode survey could not be conducted. The survey was conducted under suitable weather conditions (i.e. visibility more than 1.5 n.miles and the wind speed less than 7.5m/s). The survey hour was set from 6:00 a.m. to 6:00 p.m. The vessel speed was planned to be 11.5 knots with slight adjustment to avoid vibration of vessel. The planning and implementation of these surveys were carried out under the oversight by Tomio Miyashita (NRIFSF).

Other experiments
Biopsy skin sampling using Larsen gun was planned to be carried out in the initial research plan, but could not be conducted due to the domestic permission problem. Because angle and distance training and experiments were conducted just before the survey (May to July in 2014) with exactly the same observers on same vessels, the results can be applicable to this survey. Therefore, no experiment was carried out in this survey.

RESULTS

Sub-area 7CN
The sub-area 7CN was covered by the *SM2*, during the periods from 1 to 7 September. Fig.3 shows the actual track lines covered by the vessel and sighting positions of large whales. A total searching distance was 614.6 n. miles, and the coverage was 83.2% of the pre-determined track lines. Numbers of sightings for large cetaceans are given in Table 1. A total of 6 schools/6 animals of common minke whales were sighted. Among them, 5 schools/5 animals were primary sightings. In addition, 1 schools/2 animals of fin whales, and 3 schools/5 animals of sperm whales were sighted.

Sightings of common minke whales were made in inshore waters in the eastern side of the research area (off Kushiro and Akkeshi), where the JARPAN II coastal component off Kushiro targeting common minke whales has been conducted in early September to late October. Sighting distribution of common minke whales obtained from the present survey was almost same with those from the JARPN II surveys. Fin whales were sighted rather offshore areas compared with common minke whales. Sightings of sperm whales were concentrated in the relatively offshore waters in the western side of the research area.

Sub-area 10E
The sub-area 10E was covered by the *SHU*, during the almost same periods of the *SM2*, from 1 to 12 September. A total searching distance was 712.2 n. miles, and the coverage was 89.0% of the pre-determined lines. Fig. 4 shows the actual track lines with searching efforts and sighting positions of common minke whales. Fig. 5 shows sighting position of fin whales. Numbers of sightings for large cetaceans are given in Table 1. In sub-area 10E, a total of 9 schools/10 animals of common minke whales were sighted. Among them, 8 schools/9 animals were primary sightings. In addition, 2 schools/2 animals of fin whales, and many schools of beaked whales were sighted.

Common minke whales were sighted in the northern side (near the Rishiri Island, and the Musashi Bank), and southern side (near the Ohshima Island) of the research area. Fin whales were sighted in almost same positions of common minke whales sighted (on the Musashi Bank and near the Ohshima Island), but no sightings were made near the Rishiri Island.

Sub-area 11
The sub-area 11 was covered by the *SHU*, during the periods from 28 to 31 August. A total searching distance was 262.6 n. miles, and the coverage was 65.5% of the pre-determined lines. Figs. 4 and 5show the actual tracks with searching efforts and sighting positions of common minke and fin whales. Numbers of sightings are given in Table 1. Although the coverage of the research area (i.e. the Japanese domestic waters) in sub-area 11 is small, number of sightings of common minke whales (a total of 19 schools/24 animals) was relatively high in sub-area 11, compared with the 7CN and 10E. Among them, six schools/seven animals were primary sightings. Number of sightings of fin whales was also high (4 schools/15 animals) which included one school with 10 animals.

Sightings of common minke whales were made in inshore waters along the coast line from Abashiri to Monbetsu. Fin whales were sighted in slightly offshore waters in the eastern side of the research area. Near the sighting positions of common minke and fin whales, many sea birds that behaved actively and ripples made by small fishes were frequently observed. These implied that suitable feeding environments for the whales were formed in these waters in this season.

DISCUSSION

In the present surveys, a total of 34schools/40 animals of common minke whales, 7 schools/19 animals of fin whales, and 3 schools/5 animals of sperm whales were sighted. Common minke whales were sighted in all three sub-areas and abundant distribution was observed especially in sub-area 11.These results indicated that coastal waters not only in the Pacific side of the Hokkaido (off Kushiro), but the Okhotsk Sea and the Sea of Japan side of the Hokkaido was also important habitat for common minke whales in late August to early September. The

results provide information on the migration and abundance of the whales in those waters in summer season, and will contribute to the future implementation assessment of the North Pacific common minke whales.

Around the coastal waters off Japan, two stocks of common minke whales (J stock: mainly distributed in the Sea of Japan, and O stock: mainly distributed in the western North Pacific) are existed, and genetically identified (Kanda, *et al*., 2009). Both stocks are known to be mixed in the southern Okhotsk Sea in April (Wada, 1991) to early summer (Kato, 1992), and most of the O stock animals continue to migrate further north in the Okhotsk Sea in midsummer season (Hatanaka and Miyashita, 1997). In autumn, the O stock animals are thought to be started southward migration toward wintering grounds, and some of them get through the Pacific side of the Hokkaido (sub-area 7CN, off Kushiro) in early September to late October. In the Sea of Japan side of the Hokkaido (sub-area 10E), common minke whales were sighted in the waters near the Rishiri Island in at least until November 2013, and one satellite tagged animal at that location moved from sub-area 10E to 11 in November (Kishiro, *et al*., 2013). These implied the possibility of the mixing of both stocks of common minke whales sighted by the present surveys in sub-area 11 in late August. However it was unfortunate that we could not carry out the biopsy skin sampling in the present surveys due to the Japanese domestic permission problem. In the process of the implementation assessment of the North Pacific common minke whales, the stock structure studies is one of the most important issue, and the biopsy sampling and tagging studies will be needed in the future surveys in these waters.

The recent abundance of North Pacific common minke whale was estimated to be 13,067 (CV=0.287) for sub-area 12NE in 2003, 3,401(CV=0.409) for sub-area 12SW in 2003, and 377 (CV=0.389) for sub-area 11 in 2007, based on the past Japanese dedicated sighting surveys (Miyashita, 2004, 2008), and these estimates were used in the second implementation assessment of the North Pacific common minke whales. But, six to ten years have already passed since those estimates were obtained, and the recent information on the abundance levels in those waters will be needed for the future assessment. In this regards, we will hope and welcome the collaborative works with the Russian scientists to progress the matters.

ACKNOWLEDGMENTS

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Table 1. Number of sightings of large whales made by the *Shonan-maru No.2* (SM2) and the *Shunyo-maru* (SHU) sighting surveys in 2014 summer season.

	sub-area 7CN						sub-area 10E						sub-area 11					
	Primary		Secondly		Total		Primary		Secondly		Total		Primary		Secondly		Total	
Species	sch.	ind.	sch.	ind.	sch.	ind.	sch.	ind.	sch.	ind.	sch.	ind.	sch.	ind.	sch.	ind.	sch.	ind.
Common minke whale	5	5	1	1	6	6	8	9	1	1	9	10	6	7	13	17	19	24
fin whale	1	2	0	0	1	2	2	2	0	0	2	2	2	12	2	3	4	15
sperm whale	2	3	1	2	3	5	0	0	0	0	0	0	0	0	0	0	0	0

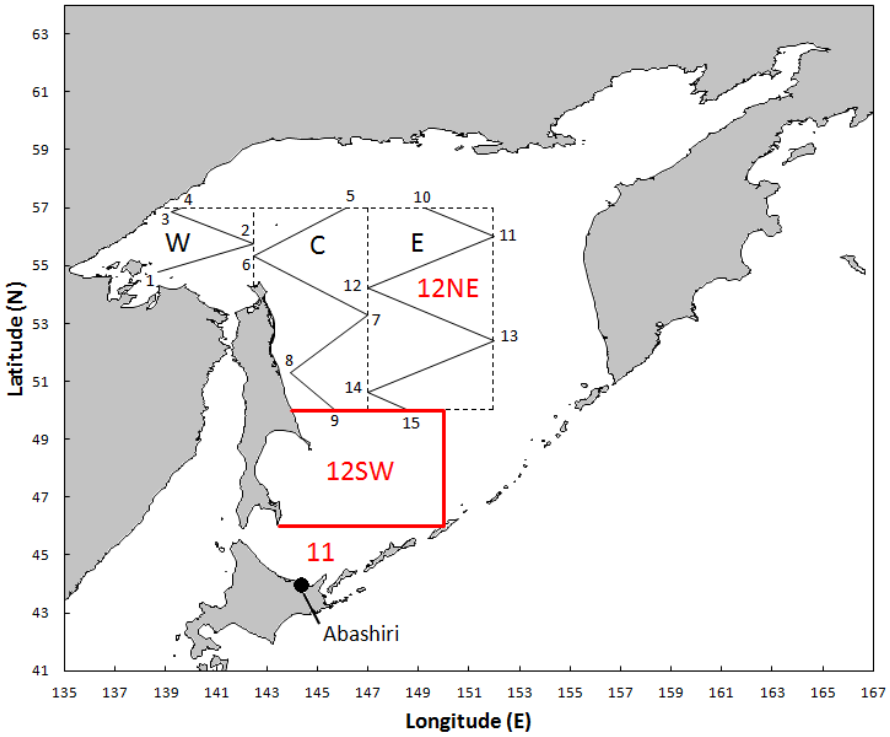

Fig. 1. Initial planed survey areas and track lines for the sighting survey in the Okhotsk Sea in 2014 summer season (SC/65b/RMP02). Solid lines: pre-determined track lines; dotted lines: research blocks; Red lines: boundary of the sub-area for the IWC implementation assessment of common minke whales. The waypoint 1 to 9 were planned to be covered by the *SM2*, and 10 to 15 were planned to be covered by the *SHU*.

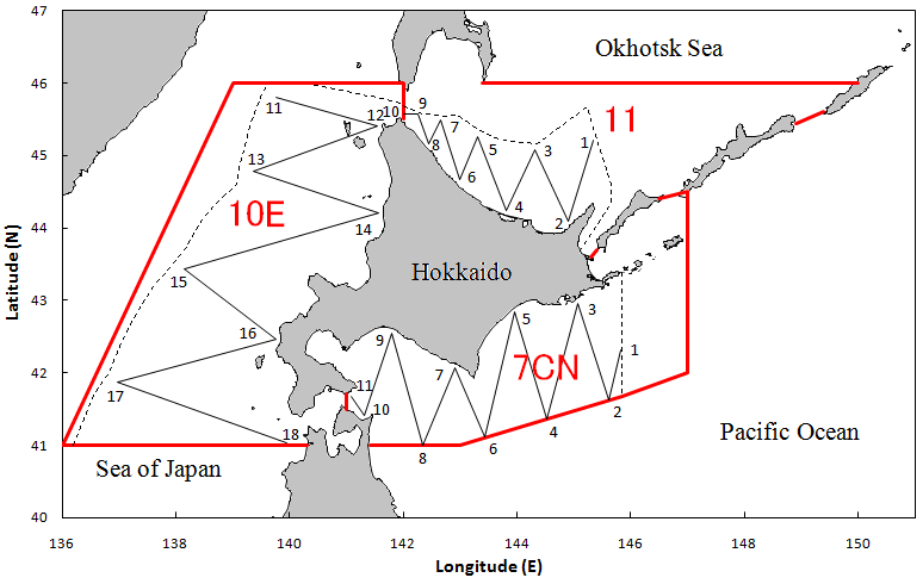

Fig. 2. Re-constructed survey areas and tracklines for the substitute surveys in the Japanese coastal waters around Hokkaido, northern Japan (sub-area 7CN, 10E, and 11). Solid lines: pre-determined track lines; dotted lines: research blocks; Red lines: boundary of the sub-area. Sub-area 7CN was covered by the *SM2*, and sub-area 10E and 11 were covered by the *SHU*.

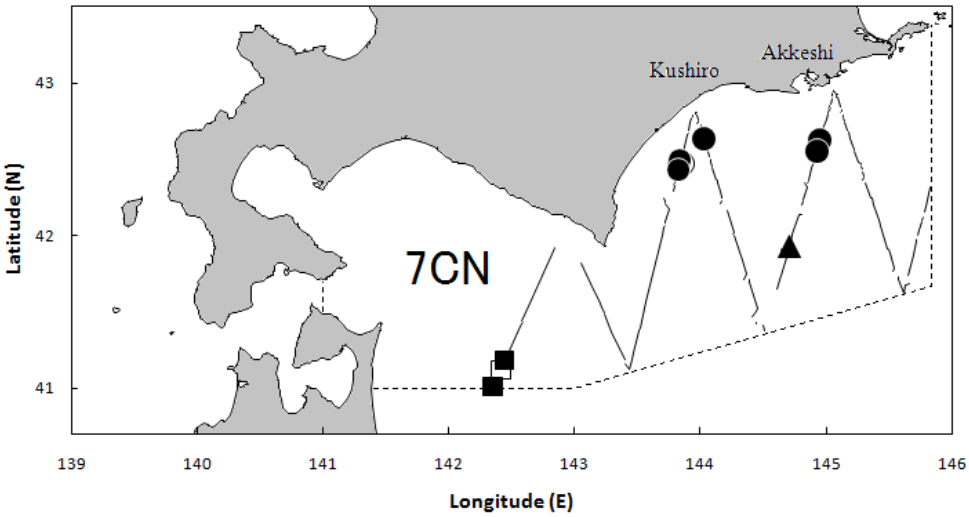

Fig. 3. Sighting positions of large whales and track lines with searching efforts made by the *SM2* in sub-area 7CN. ●: common minke whales, primary sightings; ○: common minke whales, secondary sightings; ▲: fin whales, primary sighting; ■: sperm whales, primary sightings; □: sperm whales, secondary sightings; dotted lines: boundary of the research block.

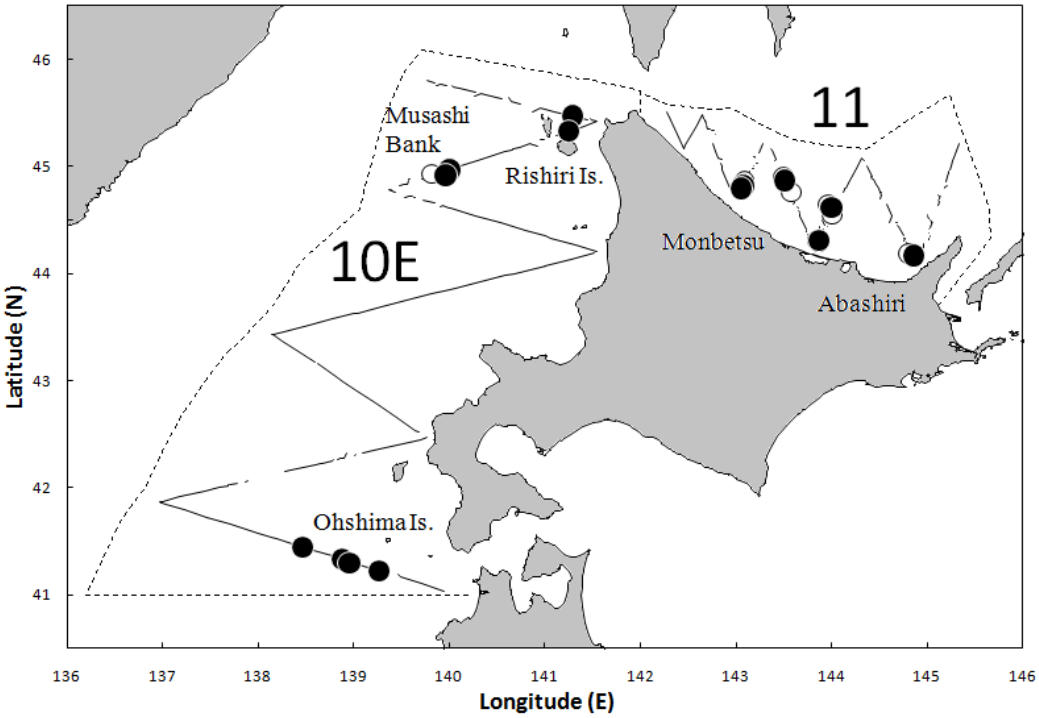

Fig. 4. Sighting positions of common minke whales and track lines with searching efforts made by the *SHU* in sub-area 10E and 11. ●: common minke whales, primary sightings; ○: secondary sightings; dotted lines: boundary of the research block.

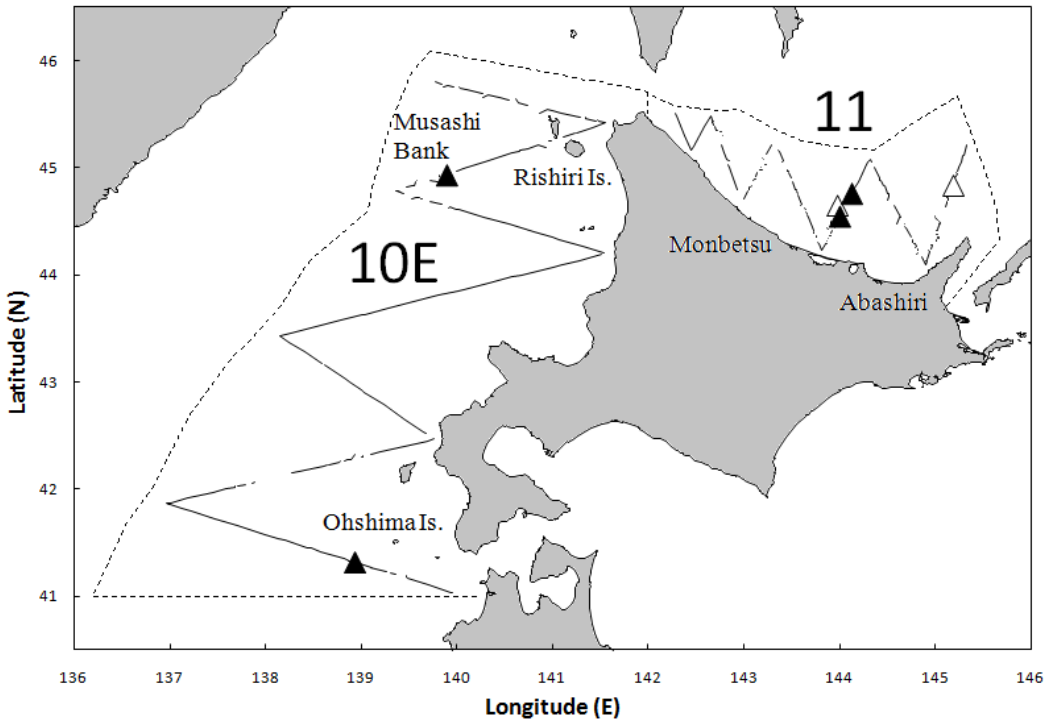

Fig. 5. Sighting positions of fin whales and track lines with searching efforts made by the *SHU* in sub-area 10E and 11. ▲: fin whales, primary sightings; △: secondary sightings; dotted lines: boundary of the research block.