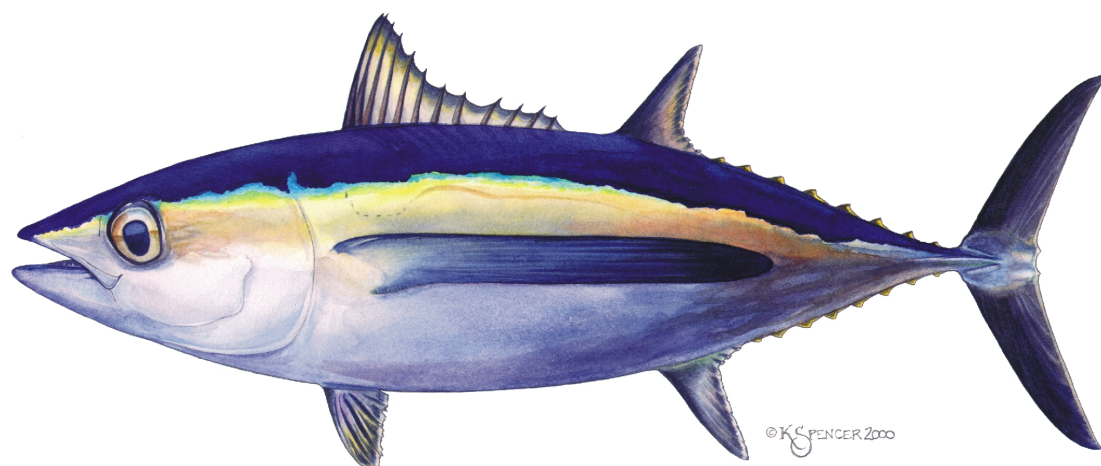


Spatio-temporal length composition caught by Japanese pole and line, and longline fishery ¹

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Introduction

Definitions of Japanese fisheries in 2011 stock assessment for SS3 (stock synthesis) was determined by differences of target fish size between season and area (Ichinokawa, 2009a; 2009b and Ichinokawa and Uosaki, 2009). In 2011 stock assessment, a concern was raised that different age were caught in the same season and areas. This is because of target fish size could be changed due to change of fishing ground formations, indicating that it is difficult to determine specific boundary for fisheries definitions. In this document, length data collected in NRIFSF was analyzed for better understanding of spatiotemporal characteristics of North Pacific albacore length composition by Japanese fisheries, season and areas to provide some ideas for area definitions for SS3.

Data and Method

Length data

North Pacific albacore length measurements conducted at the unloading ports or onboard have been collected and compiled by the National Research Institute of Far Seas Fisheries (NRIFSF) since 1965. Length data caught by the Japanese longline (JPN LL) and pole and line (JPN PL) fisheries were used only with 1cm measurement interval. Area definitions are shown in Figure 1 for JPN PL (red) and JPN LL (blue) in 2011 stock assessment. Interannual changes of length composition were conducted for both fisheries in the areas shown in Figure 1.

Results and Discussion

Figure 2 shows length frequency-year plot caught by (a) Japanese PL and (b) LL, respectively. Interannual variations of length composition by JPN PL and LL can be summaries as follows;

- **PL** : Length frequency mode during 1965-1975, 1978-2000 and 2000-2004 was identified around 84cm-86cm, 80cm and around 70cm . Length frequency mode after 2005 were seen around 80cm .
- **LL** : North pacific albacore caught before 1970 was relatively smaller than fish caught after 1970. This smaller fish likely appeared again after 1995. Mode between 1970 and 1994 can be found at 98cm and 110cm and fish smaller than 92cm were relatively low frequency .

Figure 3(a) and (b) show length frequency-year plot caught by (a) Japanese PL qtr2 in north and south of 35°N where is same area as fisheries definition for JPN PL in 2011 stock assessment. ((a) 35°N-45°N, 140°E-180°; (b) 30°N-35°N, 130°E-180°). Figure 3(c) is length composition both north and south with combining all data. 35° was boundary for CPUE standardization in 2011 stock assessment. Albacore caught in areas of south of 35°N in qtr2 and 3 likely catch larger fish, however, these size of fish were also caught in areas of north of 35°N.

Figure 4 is same as Figure 3 but for JPN LL in qtr1. Boundary is 25°N for JPN LL . Albacore size shows between clear difference north and south. Albacore size is smaller in north (around 74cm) and larger in south (between 96 and 116 cm). In northern area, JPN LL likely caught larger fish between 1987 and 1994 . It seems that albacore size has been changed around 1995 from larger size (around 112cm) to smaller size (around 104cm). Further investigation are necessarily to investigate these changes.

Summary and Recommendations

In this document, spatiotemporal frequency distributions of north pacific albacore collected at the NRIFSF was analyzed to understand their spatiotemporal characteristics by fisheries, season and areas. There remains some issue of fisheries definition by certain latitude because similar size albacore was caught in the different areas in same quater. This may also cause conflicts between CPUE trend and length data in SS3. Thorough investigation of length data and actual spatiotemporal conditions of albacore length compositions by Japanese fisheries also gives some perspectives for further considering of fisheries definitions.

Following works should be conducted;

- Figure 2 should be separated by detailed fishery (.e.g. JPN PLOS and JPN PLDW or coastal LL and offshore LL) to understand whether target size is different between detail fishery.
- update data until 2012
- estimate effective sample size

References

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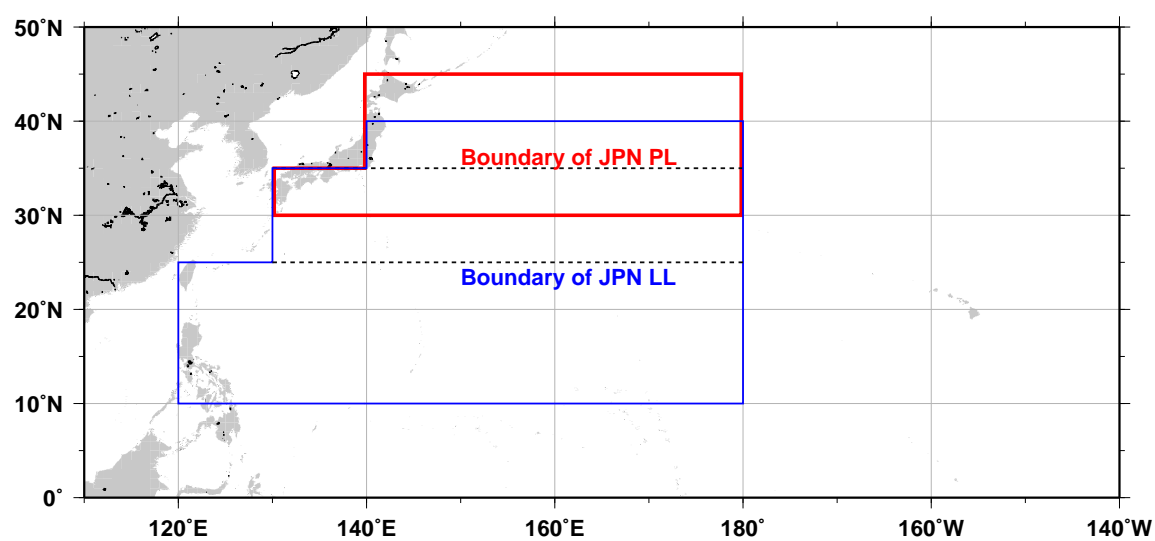


Figure 1. Area for JPN PL (red) and JPN LL (blue) . Boundary JPN PL is 35°N and 25°N for JPN LL.

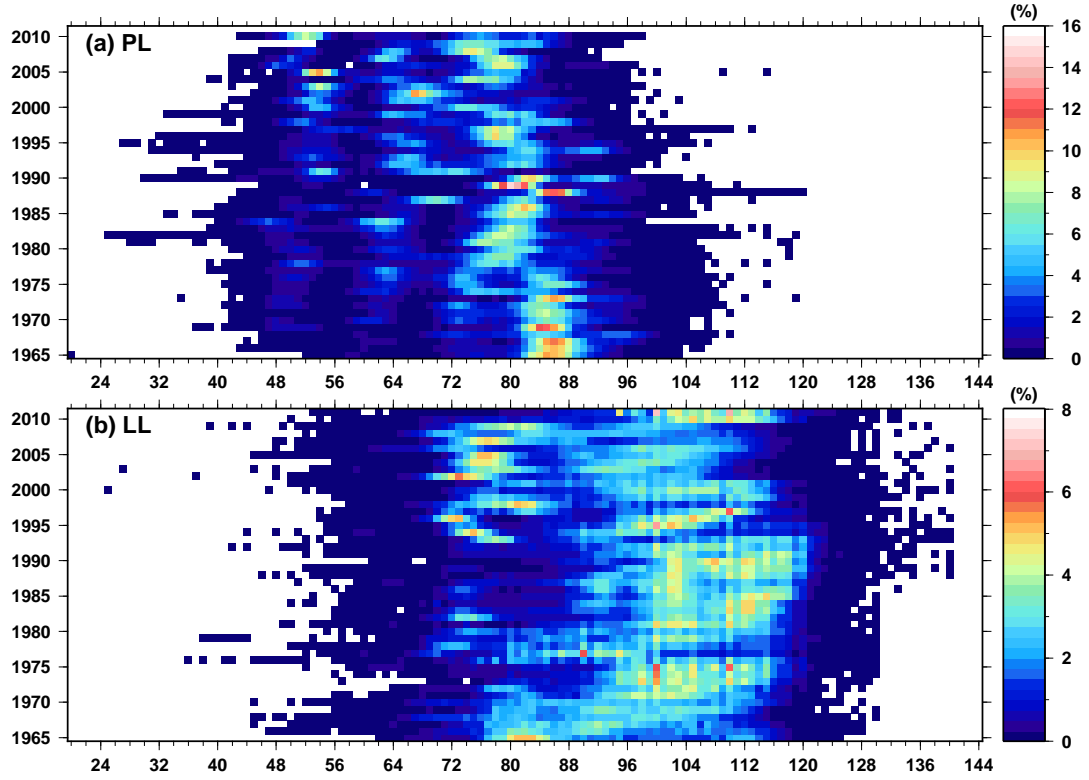


Figure 2. Year - length frequency of north pacific albacore caught by Japanese PL (a) and LL (b) in (120°E-120°W, 10°N-50°N) .

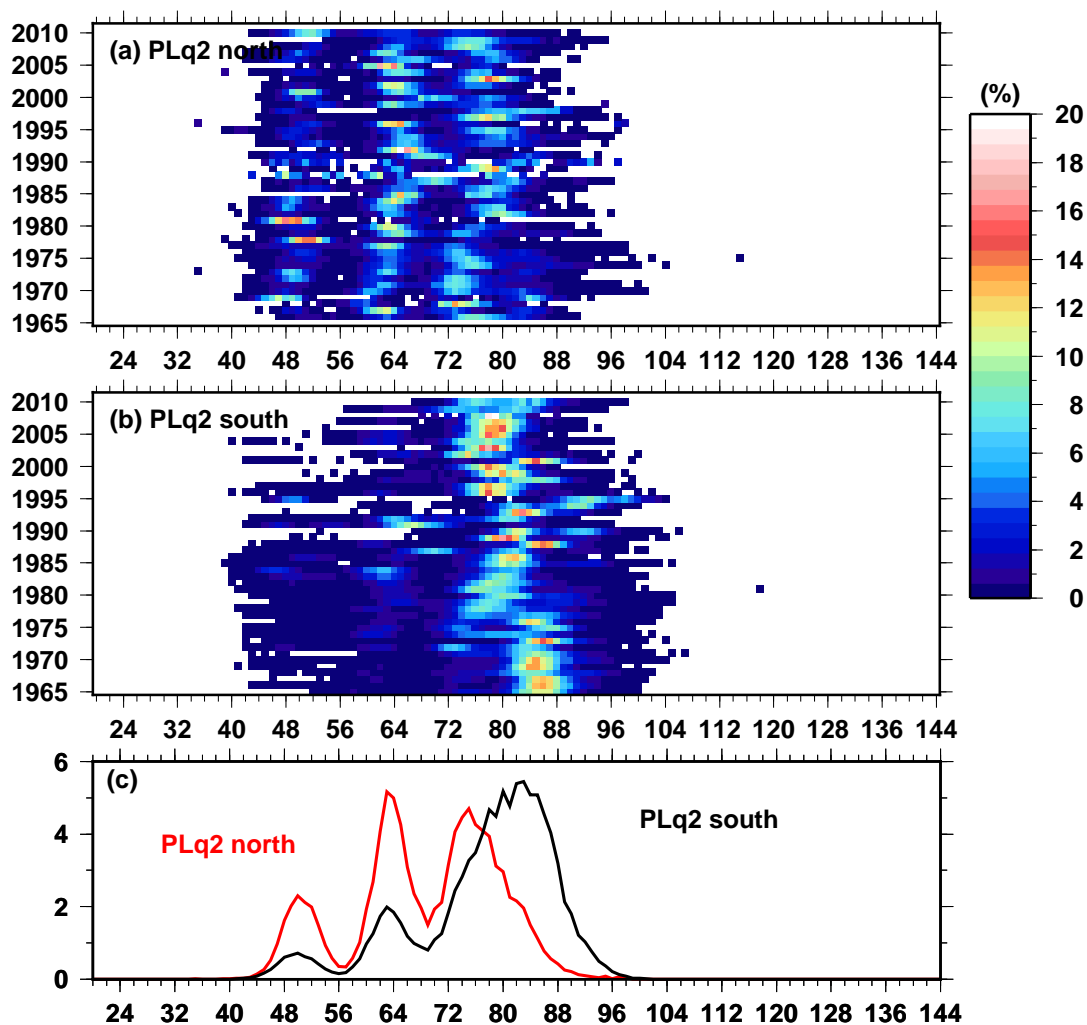


Figure 3. Length - year plot of north pacific albacore caught by Japanese (a) PL q2 north and (b) PL q2 south of 35° and (c) histogram of all data combined.

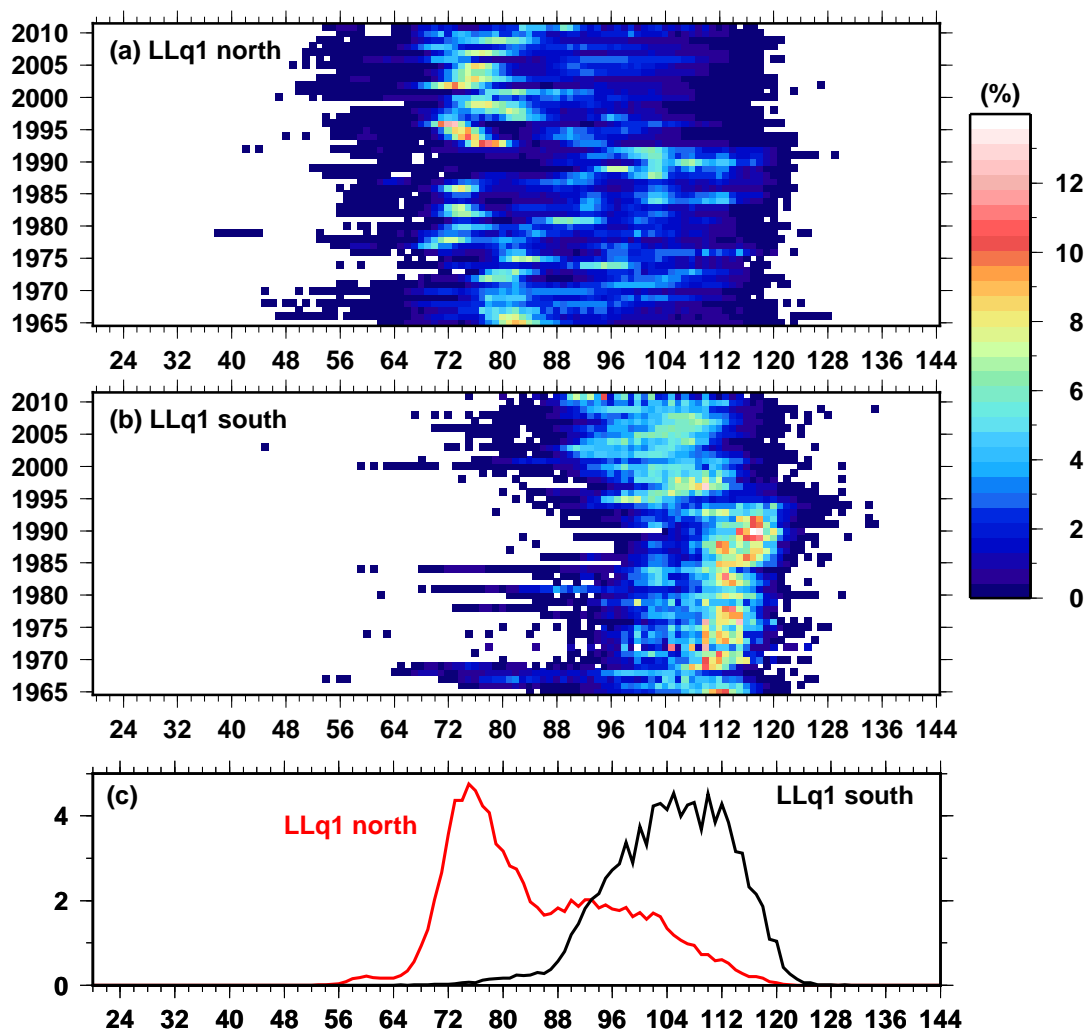


Figure 4. Length - year plot frequency of north pacific albacore caught by Japanese (a) LL q1 north and, (b) LL q2 south 35° and (c) histogram of all data combined.