REVIEW OF OPERATION AND ALBACORE CATCH BY JAPANESE LONGLINE FISHERY INCLUDING RECENT STATUS IN THE ATLANTIC

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SUMMARY

Status of effort, albacore catch and CPUE was summarized for Japanese longline fishery operating in the Atlantic Ocean including recent trends. Japanese longline vessels targeted albacore around 1960s, albacore became non-target after that, but the proportion of albacore is increasing in recent years, and is one of the target species. Historical change in proportion of fishing effort by area is observed. Albacore CPUE was high during the early period (until around 1970), sharply decreased around early 1970s, kept comparatively constant in a low level until early or mid-2000s, and increased after that. Historical change in the number of hooks per basket was observed.

RÉSUMÉ

L'état de l'effort, de la prise du germon et de la CPUE, y compris des tendances récentes, a été résumé pour la pêcherie palangrière japonaise opérant dans l'océan Atlantique. Les palangriers japonais ciblaient le germon vers les années 60 et l'ont ensuite capturé comme prise accessoire, mais la proportion du germon a connu une augmentation au cours de ces dernières années et il constitue l'une des espèces cibles. On a observé un changement historique dans la proportion de l'effort de pêche par zone. La CPUE du germon était élevée pendant la première période (environ jusqu'en 1970), a brutalement chuté au début des années 70, a maintenu un niveau relativement faible jusqu'au début ou milieu des années 2000, puis a remonté par la suite. Un changement historique a été observé dans le nombre d'hameçons par panier.

RESUMEN

Se resumen el estado del esfuerzo, la captura de atún blanco y la CPUE de la pesquería de palangre japonesa que opera en el océano Atlántico, incluidas las tendencias recientes. Los buques palangreros japoneses se dirigían al atún blanco desde aproximadamente los 60, y posteriormente el atún blanco ya no fue la especie objetivo, pero la proporción de atún blanco está aumentando en años recientes y es una de las especies objetivo. Se observa el cambio histórico en la proporción del esfuerzo pesquero por área. La CPUE del atún blanco era elevada durante el primer periodo (hasta aproximadamente 1970), descendió abruptamente en torno a principios de los setenta, se mantuvo comparativamente constante en un nivel bajo hasta principios o mediados de los 2000 y aumentó posteriormente. Se observó un cambio histórico en el número de anzuelos por cesta.

KEYWORDS

Catch/effort, longline, CPUE, albacore

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Introduction

Longline is the only tuna-fishing gear deployed by Japan at present in the Atlantic Ocean. In the Atlantic it started in 1956. Therefore, it has long history and it covers almost entire Atlantic Ocean. In addition, detailed data for catch and effort are available from logbooks. Therefore, CPUE for Japanese longline fishery is important for stock assessment for albacore as well as other tuna and tuna-like species.

In this document, historical and spatial changes of catch and CPUE for major tuna and tuna-like species including albacore and those of the fishing effort by Japanese longline fishery are described including recent trend. These are mainly aimed to provide information for understanding of standardized albacore CPUE by Japanese longline fishery.

1. Data source and analysis

In order to count the number of hooks and catches in number of tunas and billfishes including albacore, basic data used here is the logbook database that have been compiled at National Research Institute of Far Seas Fisheries (NRIFSF) based on the logbooks mandatory submitted by the fishermen of the longline vessels larger than 20 gross ton (GRT). The data are so-called "raised" data, which is aggregated by month and 5˚x5° block, and then expanded with coverage rate of the logbook. The basic data is available for 1952-2014. Another data source is logbook database which is aggregated by month, 5˚x5° block and number of hooks between floats (hooks per basket, HPB). This data is not raised, and is available for 1975-2014. ICCAT Task I database was used for the catch in weight of albacore.

Several analyses were conducted based on the subareas shown in **Figure 1** as well as entire Atlantic and Atlantic albacore north (north of 5˚N) and south (south of 5˚N) area.

2. Trend of catch, effort and CPUE

Figure 2 shows annual catch of albacore in weight. **Figure 3** shows historical change in fishing effort and albacore catch in number in the entire, north and south Atlantic. **Figure 4** and **Figure 5** show historical trend of the proportion of fishing effort by area and nominal CPUE of albacore, respectively. **Figure 6** shows species composition (in number) of the catch in each area. **Figure 7** shows geographical distribution of the effort (number of hooks), albacore catch and CPUE by decade, and
Figure 8 shows geographical distribution of species composition of the catch by decade.
Figure 9 and **Figure 10** show recent annual trend for effort, albacore catch and CPUE, and distribution of species composition, respectively.

Fishing effort in the entire Atlantic reached the first peak in 1965 (98 million hooks), and sharply decreased after that. Then it increased again with fluctuation, peaked in 1996 (123 million hooks), and has been decreasing after that (**Figure 3**). Albacore catch sharply increased between mid-1950s and mid-1960s, peaked in 1964 in number (2.1 million fish) or in 1965 in weight (42,600 t), sharply decreased until early 1970s, and kept in a low level (usually less than 10 thousand fish) after that (**Figure 3**). It is slightly increasing with fluctuation after 1998, and sharply increased during 2012-2013 and decreased in 2014. The catch 4,852 t in 2013 (1,745 t and 3,106 t in the north and south, respectively) was highest after 1972.

From 2014 fishing year, individual TAC for south Atlantic albacore has been applied to Japan, 1,355t (except for transfer from other countries), which is much lower than annual catch in 2013-2014 (calendar year). It caused sharp decrease in albacore catch in 2014 in the south Atlantic.

The proportion of fishing effort by area differed depending on the period (**Figure 4, Figure 7**). Fishing effort was mainly distributed in the tropical area during 1950s-1960s, and spread to subtropical and temperate areas during 1960s. It mainly distributed in the northeast and northwest area during early 1970s, and mainly in the northwest and temperate south area during late 1970s. After that it mainly distributed in the tropical area, but the proportion of northwest and/or temperate north area was also high between mid-1990s and mid-2000s. In recent years, the proportion in the southeast area became higher, although fishing effort was mainly distributed in the tropical area.

Nominal CPUE for albacore in the entire Atlantic shows comparatively similar trend to that for the catch level after mid-1960s (**Figure 5**). The values and trend for nominal CPUE were comparatively similar between north and south. However, there were some differences. CPUE in the early period (before 1970) was much higher in the south than in the north. During mid-1970s to late 2000s, CPUE shows declining trend in the north, but it was comparatively constant in the south.

Species composition of the catch differed depending on area and period (**Figure 6,**
Figure 8). Bigeye and/or yellowfin tuna dominated in the tropical area, although comparatively high proportion (more or less 20%) of albacore was observed before 1970. In recent years the proportion of albacore got higher in the tropical area (both north and south). In the mid-latitude area, in addition to bigeye and/or yellowfin tuna, albacore was also dominant in several areas and periods, for example, in the early and recent period in the northwest, southwest and southeast areas.

In recent years, high albacore catch and CPUE were observed mainly in the temperate area of south Atlantic, especially around Namibia and South Africa, where albacore was main component of the catch (**Figure 8, Figure 9**). Catch in the temperate area of north Atlantic was not high because of low fishing effort. In 2013, comparatively high catch and CPUE was observed in the tropical area as well, although it was not observed in 2014.

3. Change in number of hooks between floats

Figure 11 shows historical change in the proportion of fishing effort (number of hooks) by each category of number of hooks per basket (HPB). In the all Atlantic Ocean, 4-7 HPB was dominant until mid-1980s, but it sharply decreased after that. The effort for 8-11 and 16-21 HPB was main component between late 1990s and mid-2000s. After that 16-21 became dominant, but the proportion for 12-15 HPB got higher in recent years.

In the tropical area, 16-21 HPB has been main component since mid-1990s, but the proportion for 12-15 HPB has been slightly increasing since early 2000s. In the northwest and temperate south areas, 4-7 HPB was dominant until early 1990s, but it sharply decreased around mid-1990s and 8-11 HPB became dominant after that. In the southeast and temperate north areas, the proportion for 12-15 HPB had been increasing until around 2010, and it became dominant in recent years. According to the results of CPUE standardization (updating of CPUE) for Japanese longline fishery, 12-15 HPB got highest CPUE both in the north and south Atlantic (Matsumoto, in press). Therefore, possibly the increase in the proportion of this gear configuration leads to increased targeting of albacore.

4. Conclusion

The results in this paper indicate that historical changes occurred for fishing ground and target species for Japanese longline fishery, and that in recent years albacore seems to be targeted in a part of area. It is desirable to incorporate targeting issues for CPUE standardization, for example, to use catch and effort data for only core area. At 2013 ICCAT albacore assessment meeting, northwest area (20-40°N, west of 30°W, “northwest1” in this document) was proposed as core area for both Japanese and Taiwanese longline (Anon., 2014). It seems to be reasonable because the proportion of albacore is high for almost entire period.

References

Anonymous. 2014. Report of the 2013 ICCAT North and South Atlantic Albacore Stock Assessment Meeting (Sukarrieta, Spain - June 17 to 24, 2013), ICCAT Collect. Vol. Sci. Pap. 70(3): 717-829

Matsumoto, T. (in press). Updating of standardized CPUE for north and south Atlantic albacore by the Japanese longline fishery. Document SCRS/2016/068. 13pp.

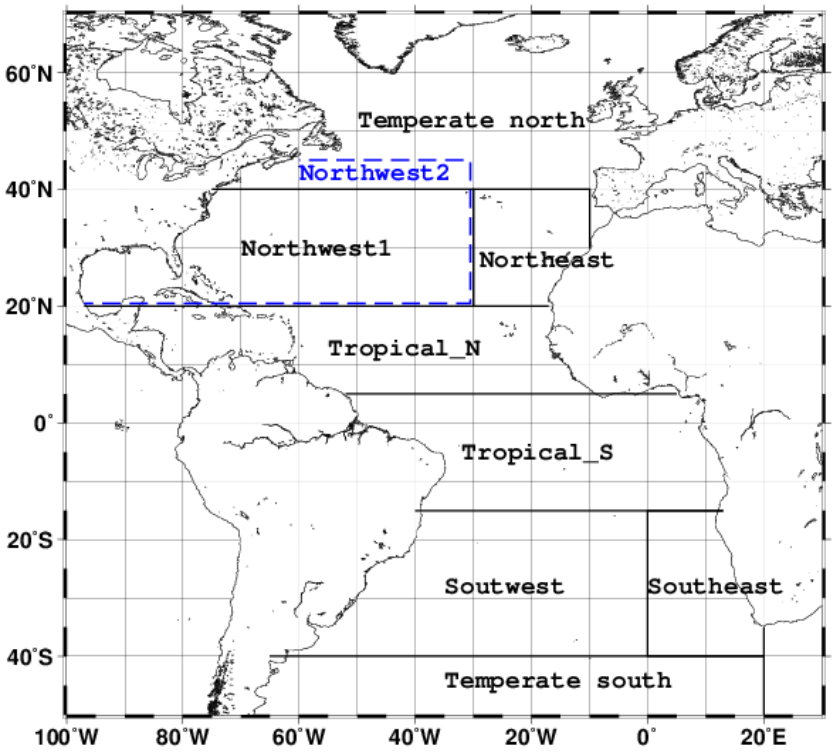


Figure 1. The geographical range to compile fishing effort, species composition of the catch and nominal CPUE for albacore by Japanese longline fishery.

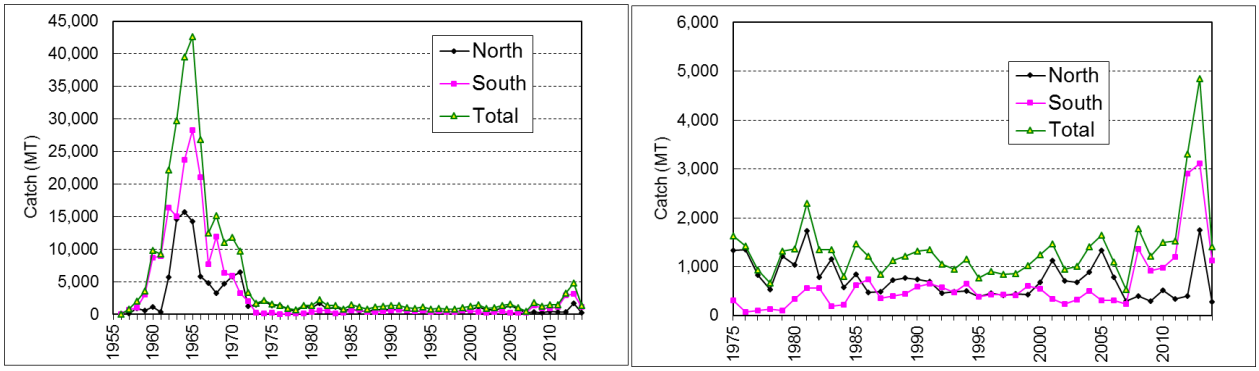


Figure 2. Amount of albacore catch in weight by Japanese longline fishery. Right panel indicates trend from 1975 onward. North: north of 5°N, south: south of 5°N (the same for other figures).

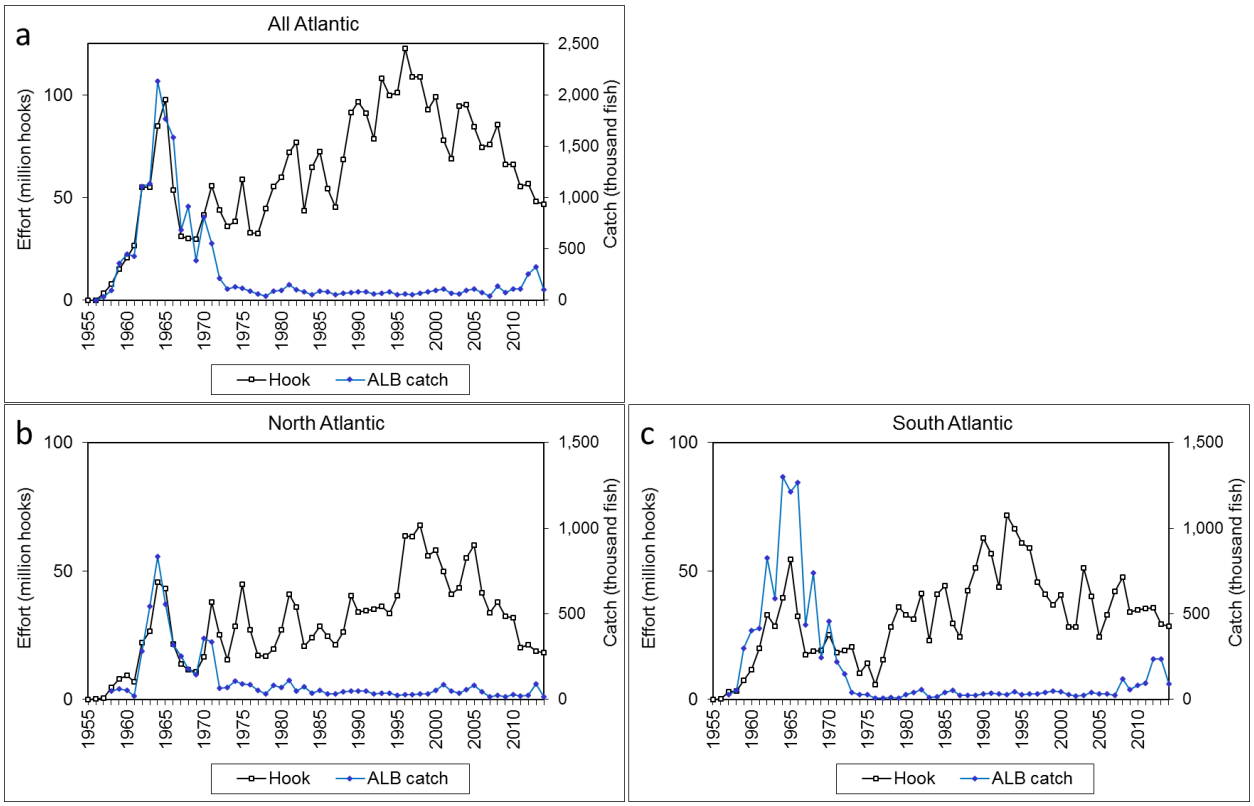


Figure 3. Historical change in fishing effort and number of albacore catch by Japanese longline fishery in the Atlantic Ocean (all, north and south Atlantic).

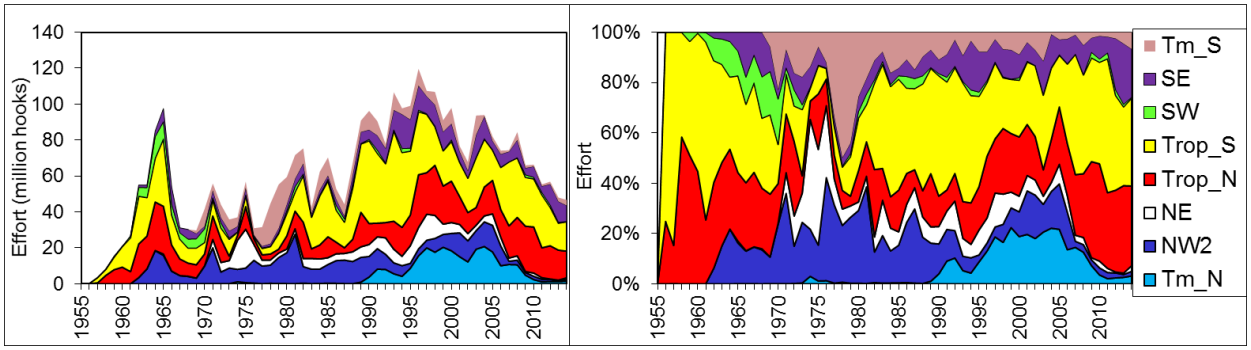


Figure 4. The number of hooks employed for each area.

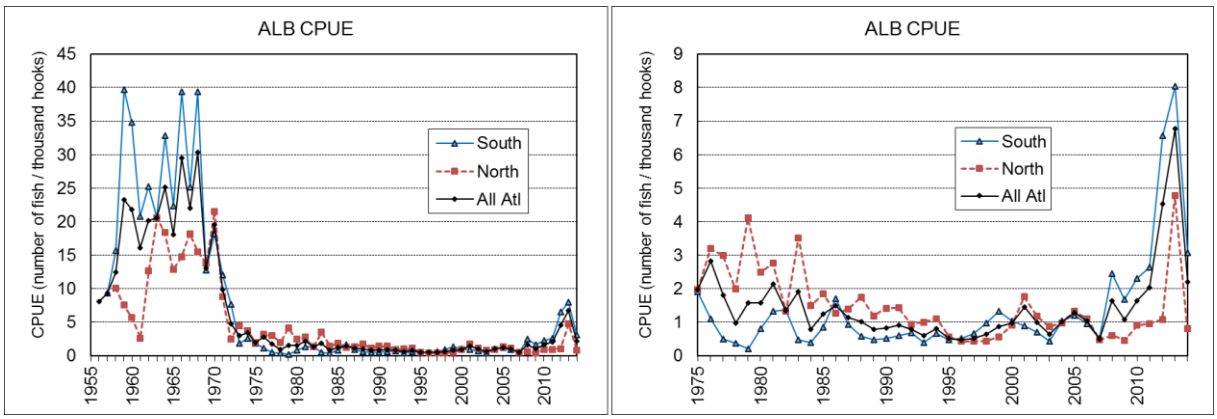


Figure 5. Nominal CPUE of albacore caught by Japanese longline fishery in each area. Left: entire period, right: from 1975 onward.

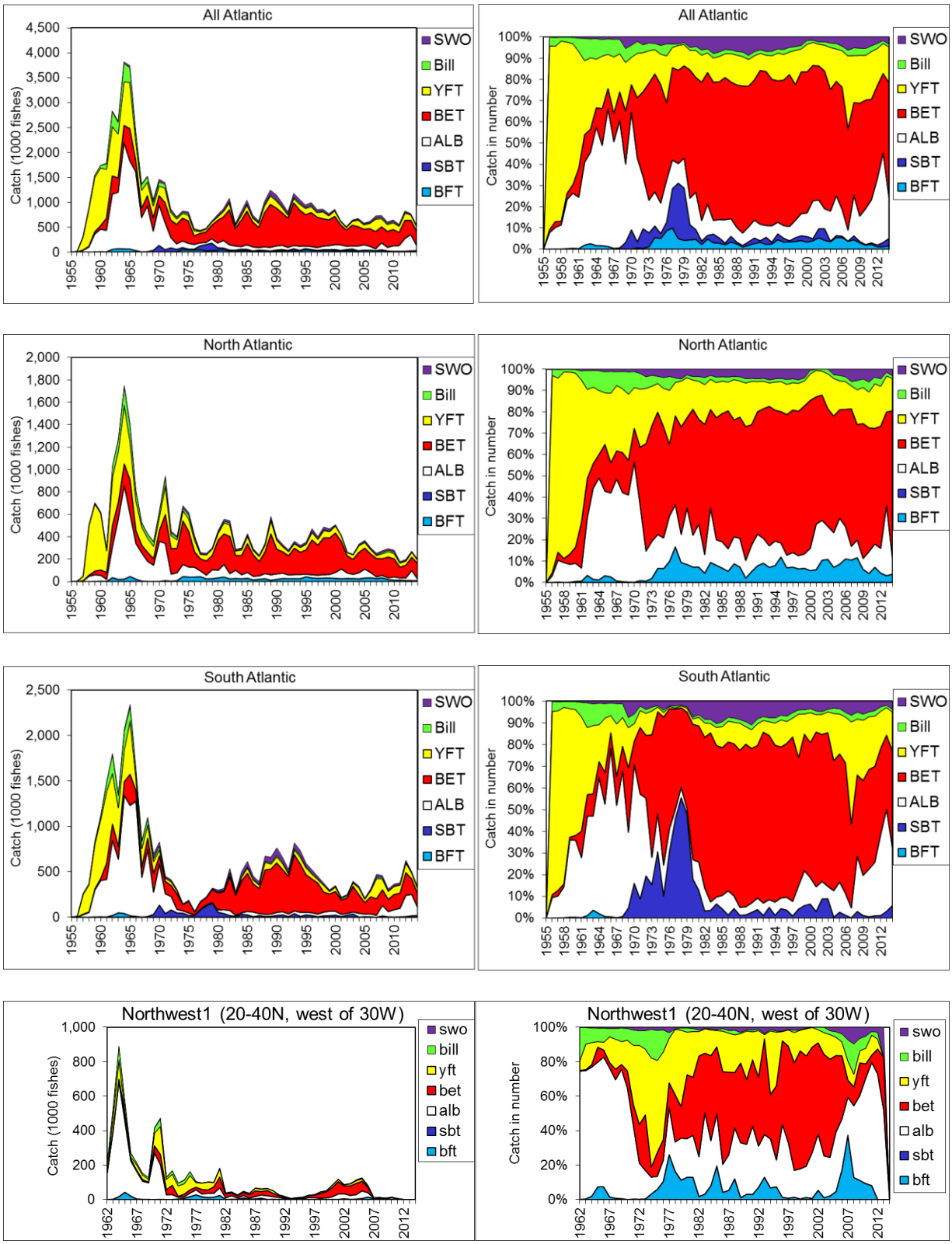


Figure 6. Species composition (in number) of the catch by Japanese longline fishery in each area.

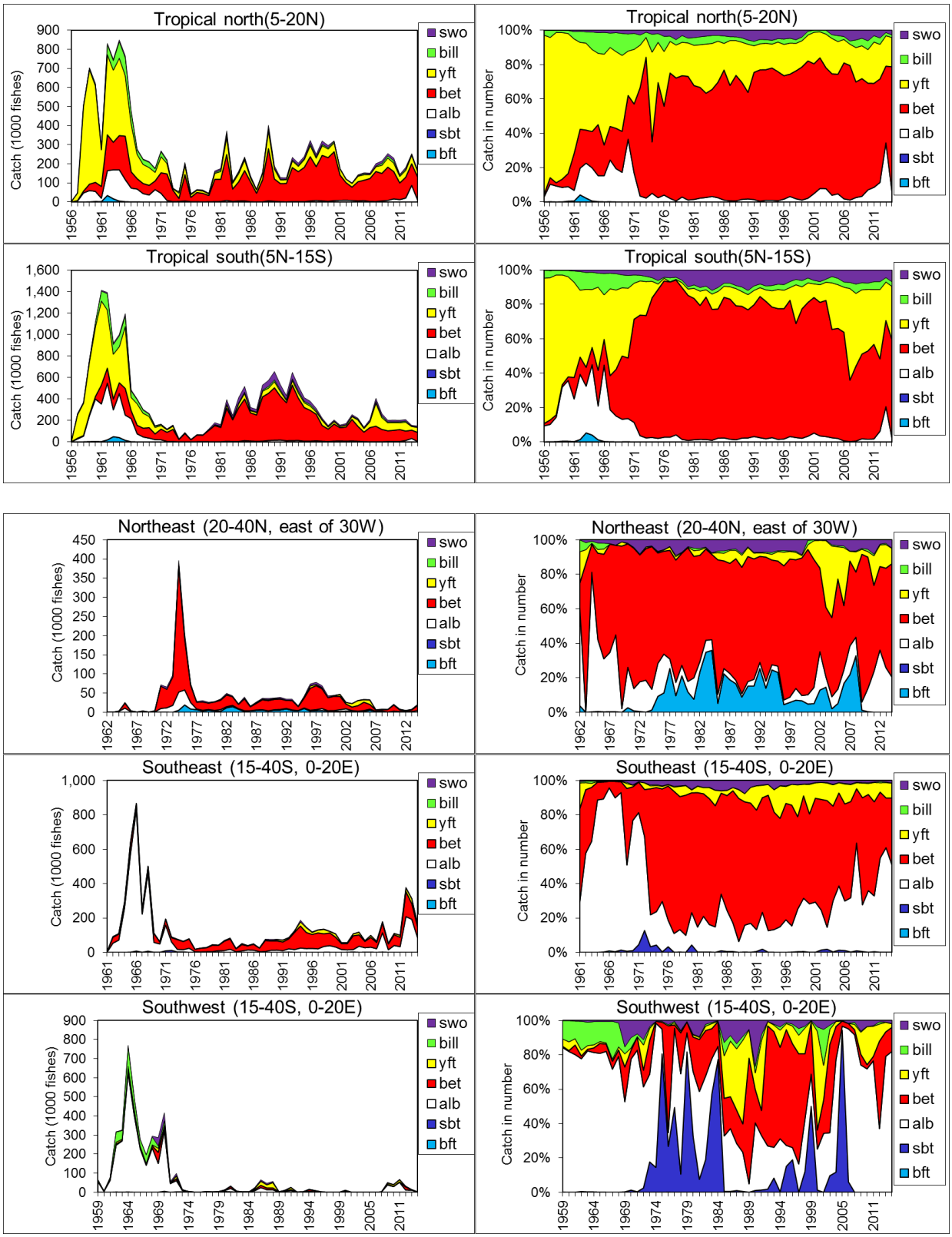


Figure 6. Species composition (in number) of the catch by Japanese longline fishery in each area. (continued)

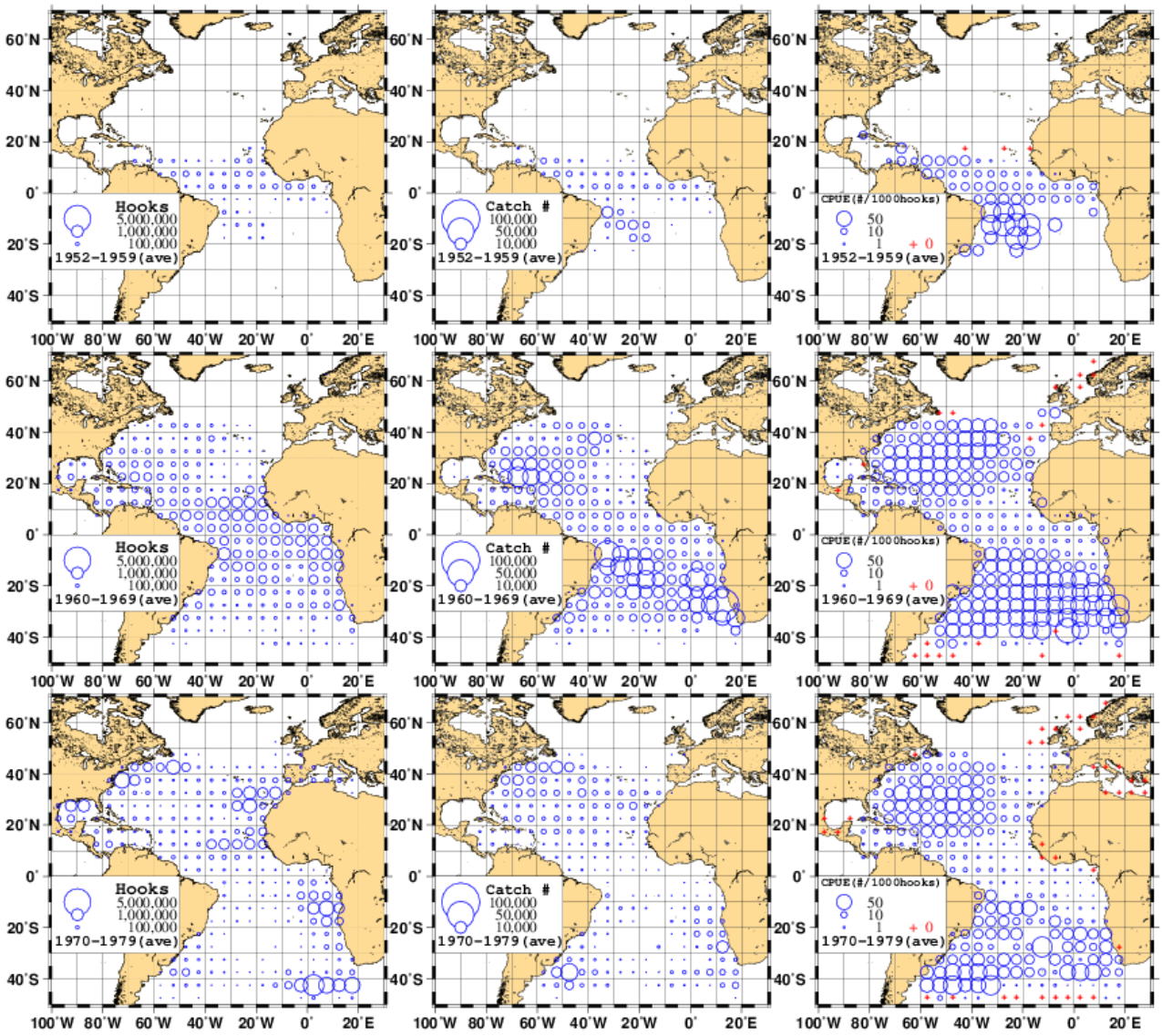


Figure 7. The average distribution of the effort (number of hooks), albacore catch (number of fish) and CPUE (number of fish/1000hooks) for each decadal period.

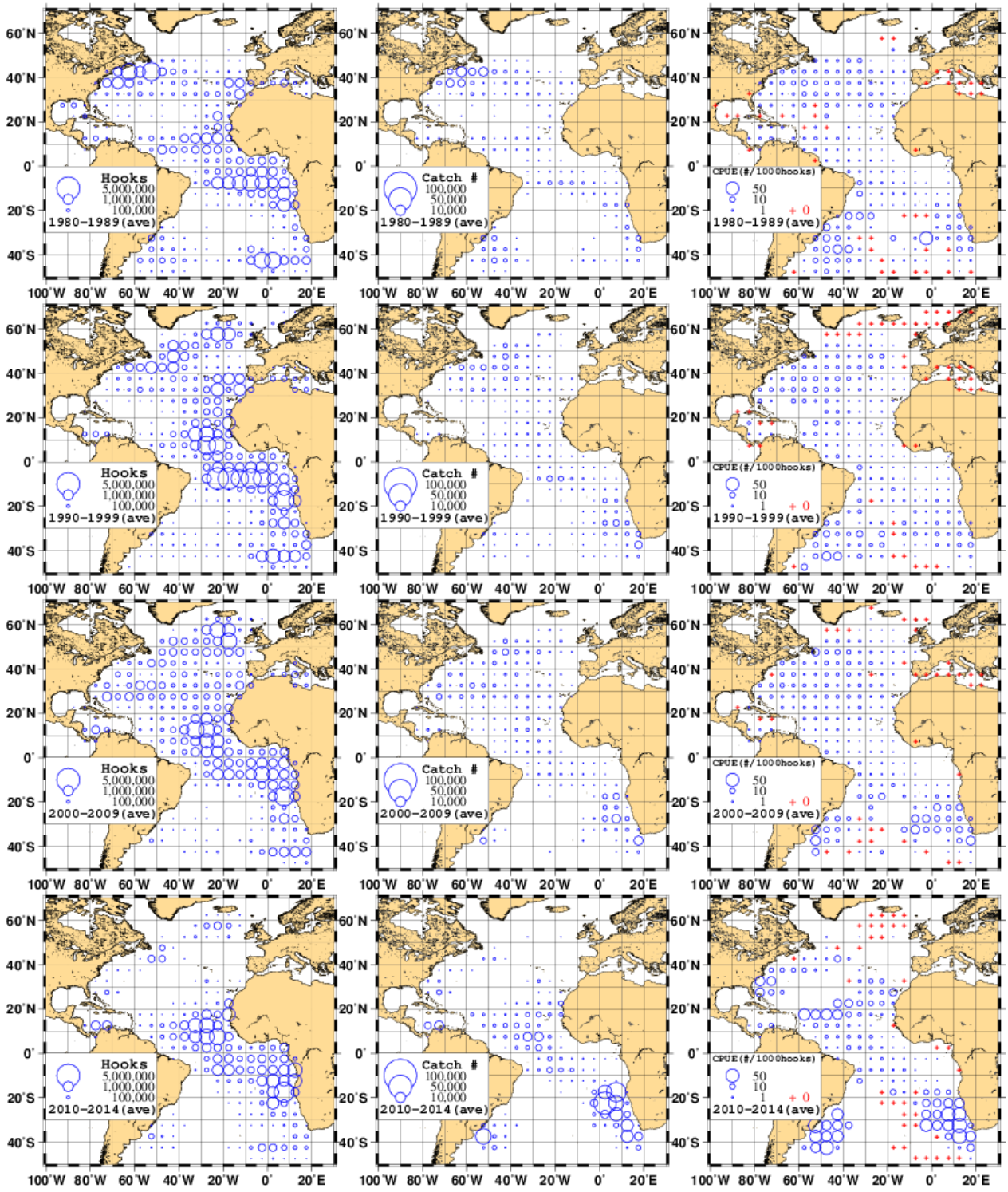


Figure 7. The average distribution of the effort (number of hooks), albacore catch (number of fish) and CPUE (number of fish/1000hooks) for each decadal period.(continued)

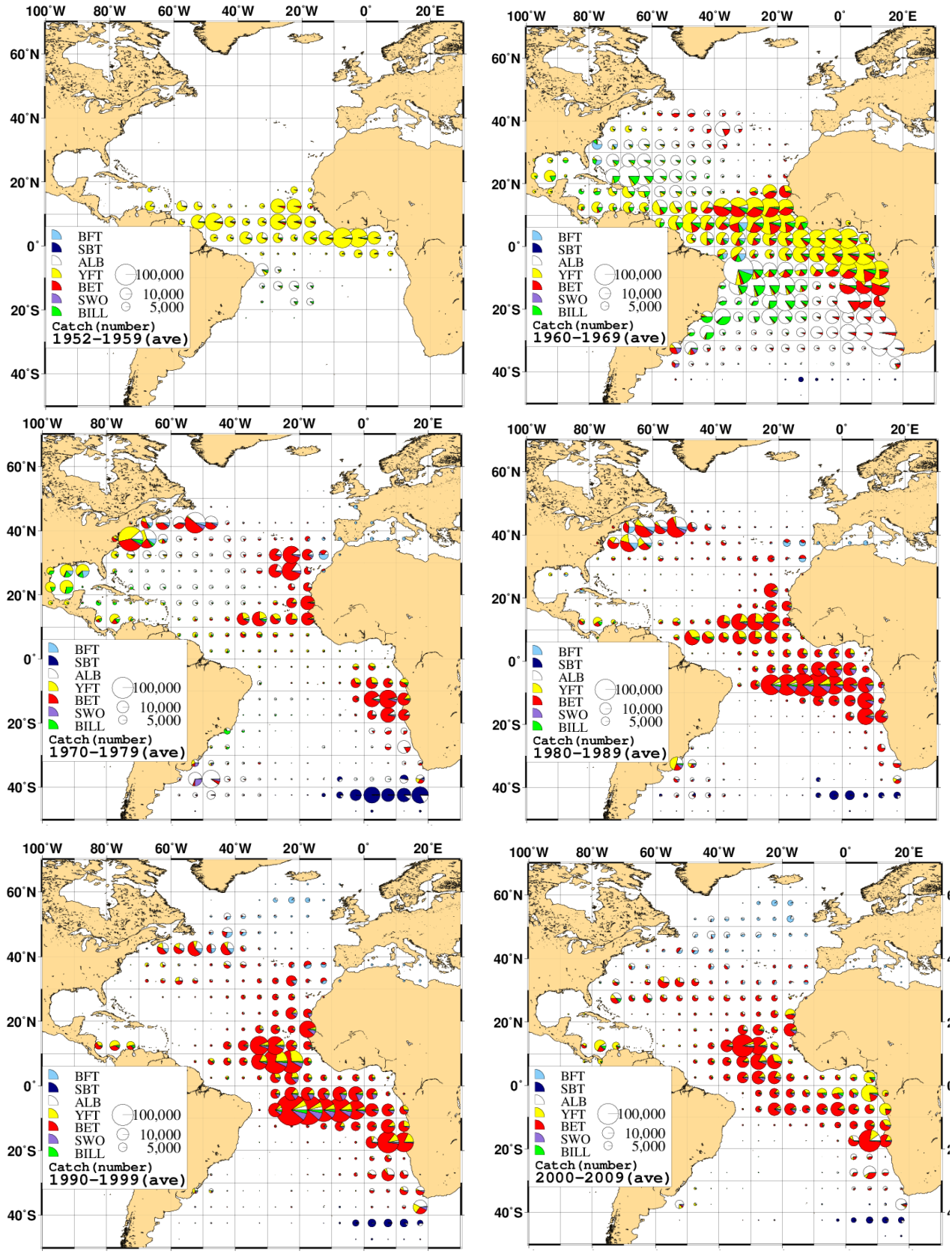
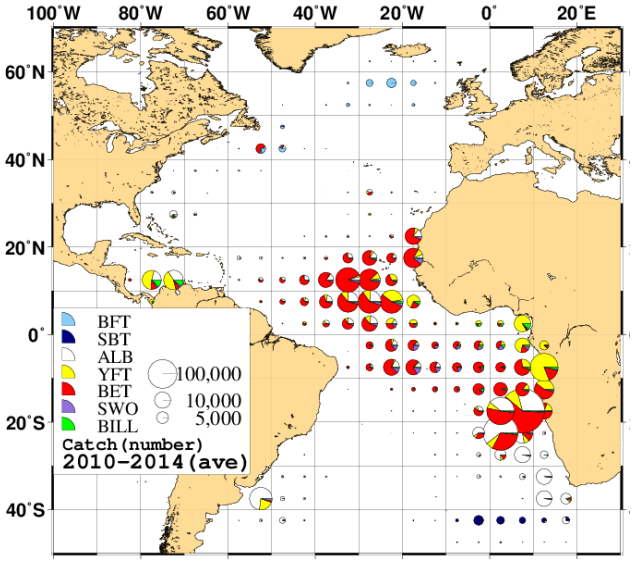


Figure 8. The averaged distribution of amount of catch in number by species for each decade. Size of circle shows amount of total of catches i.e. bluefin tuna (BFT), southern bluefin tuna (SBT), albacore (ALB), bigeye tuna (BET), yellowfin tuna (YFT), swordfish (SWO) and billfishes (BILL).



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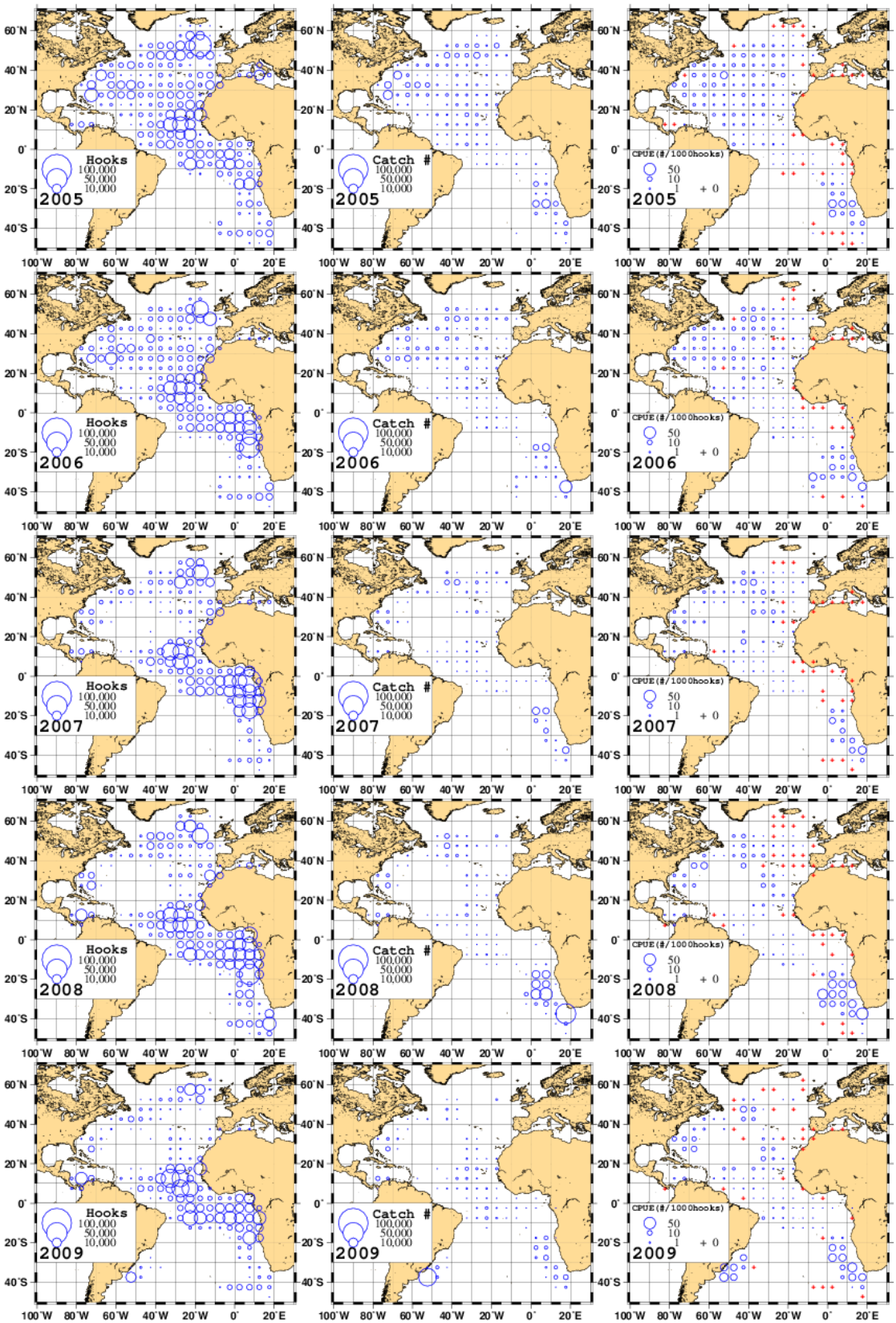


Figure 9. The geographical distribution of the effort (number of hooks), albacore catch (number of fish) and CPUE (number of fish/1000hooks) in recent years.

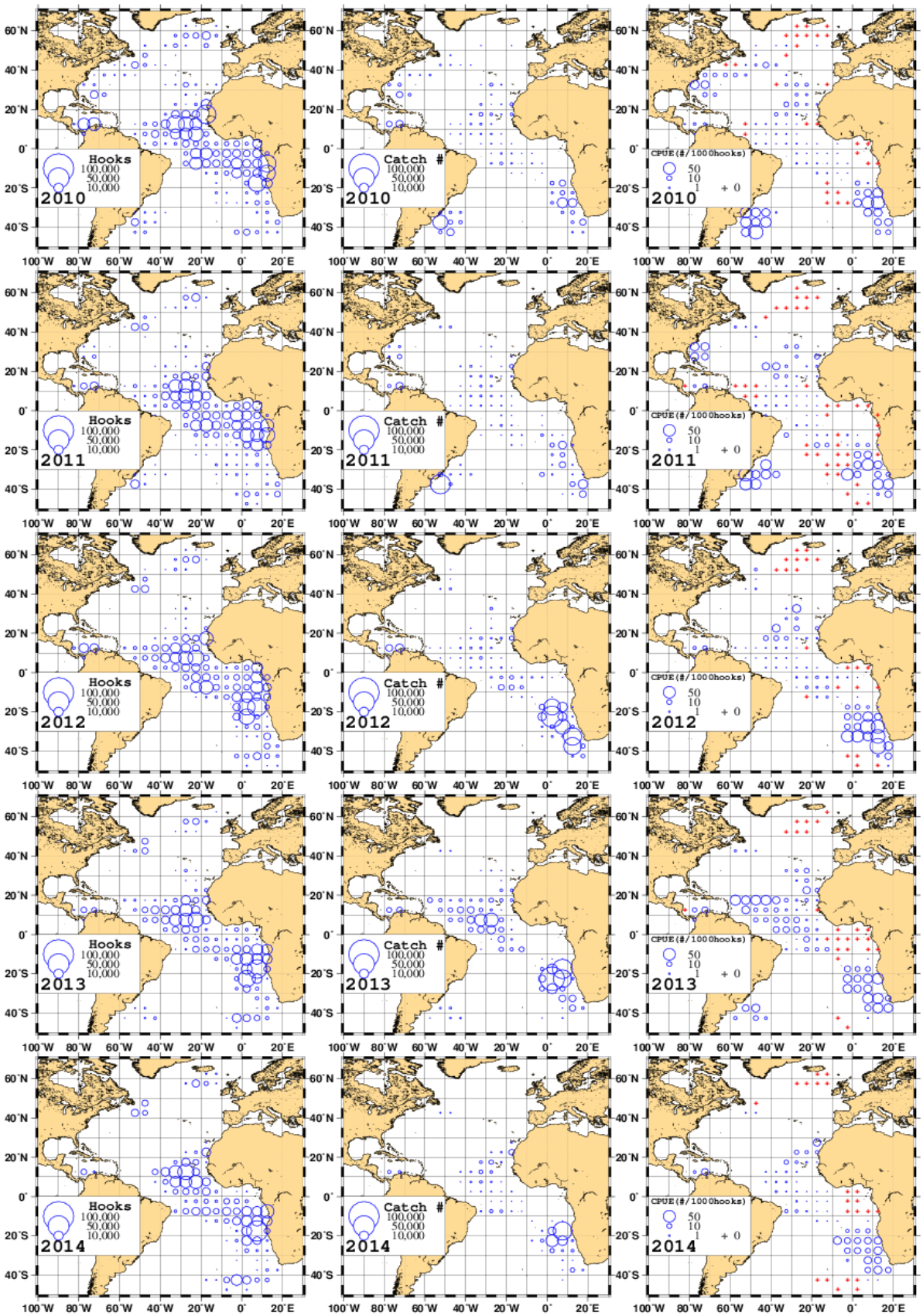


Figure 9. The geographical distribution of the effort (number of hooks), albacore catch (number of fish) and CPUE (number of fish/1000hooks) in recent years**.** (continued)

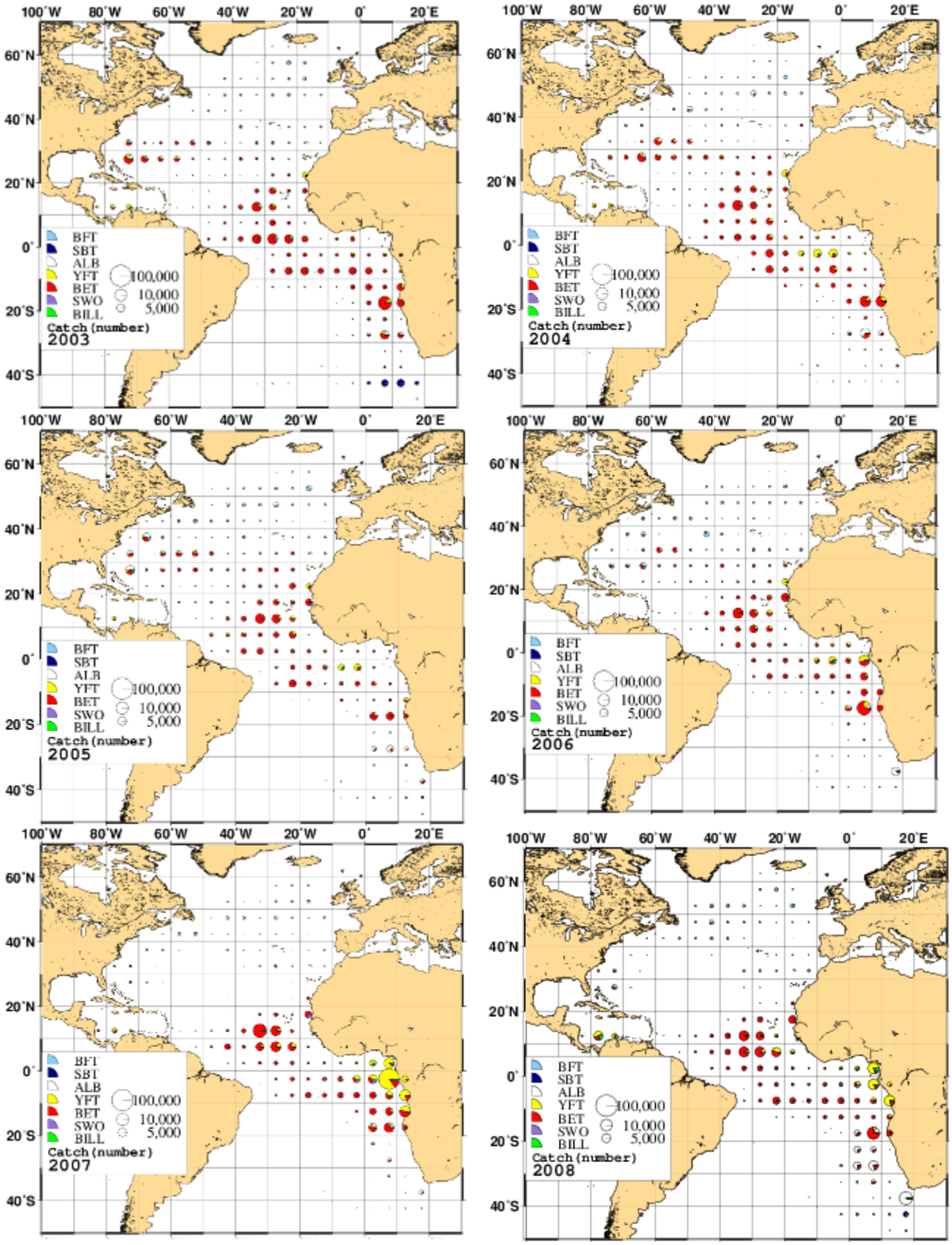
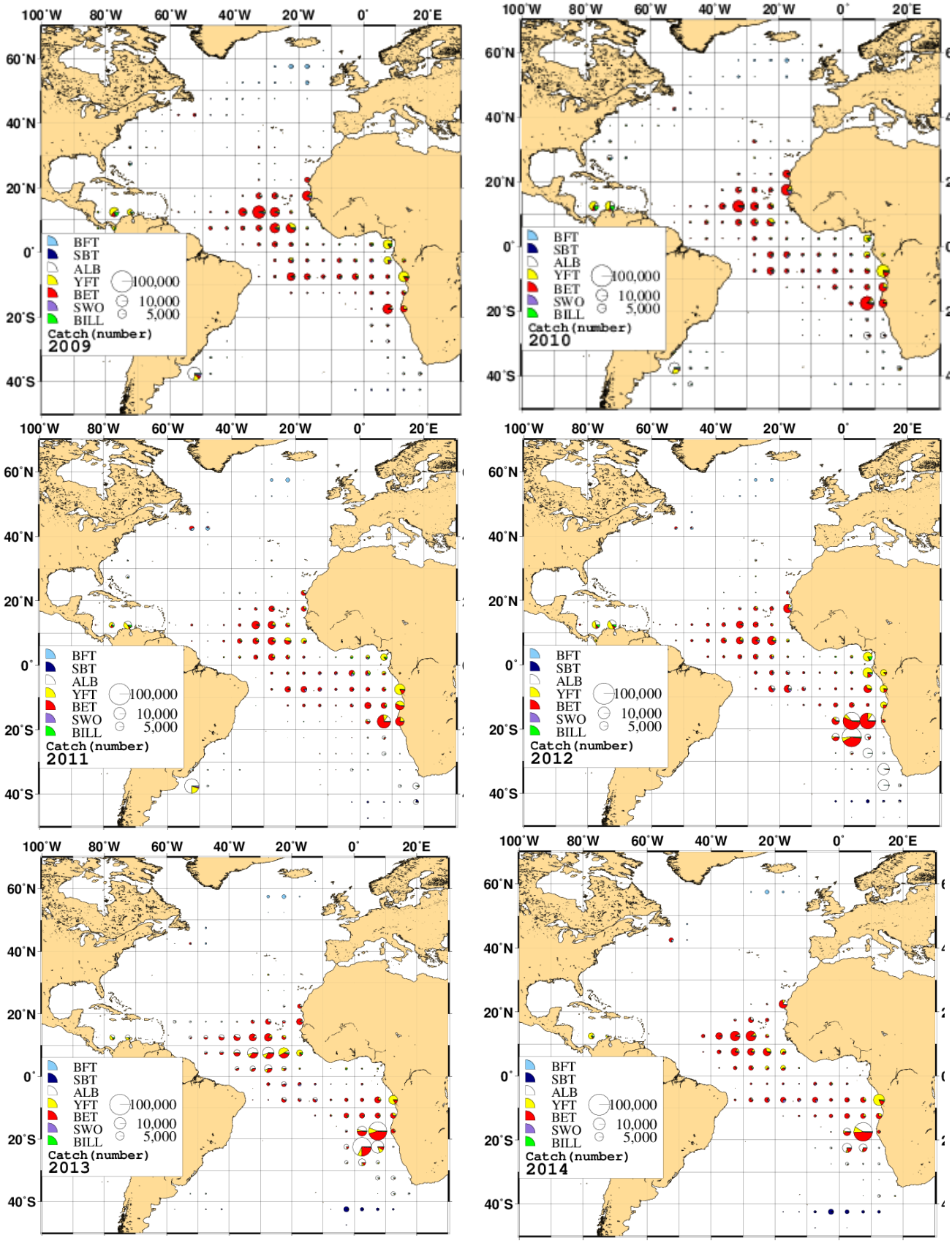


Figure 10. Annual recent distribution of amount of catch in number by species. Size of circle shows amount of total of catches i.e. bluefin tuna (BFT), southern bluefin tuna (SBT), albacore (ALB), bigeye tuna (BET), yellowfin tuna (YFT), swordfish (SWO) and billfishes (BILL).



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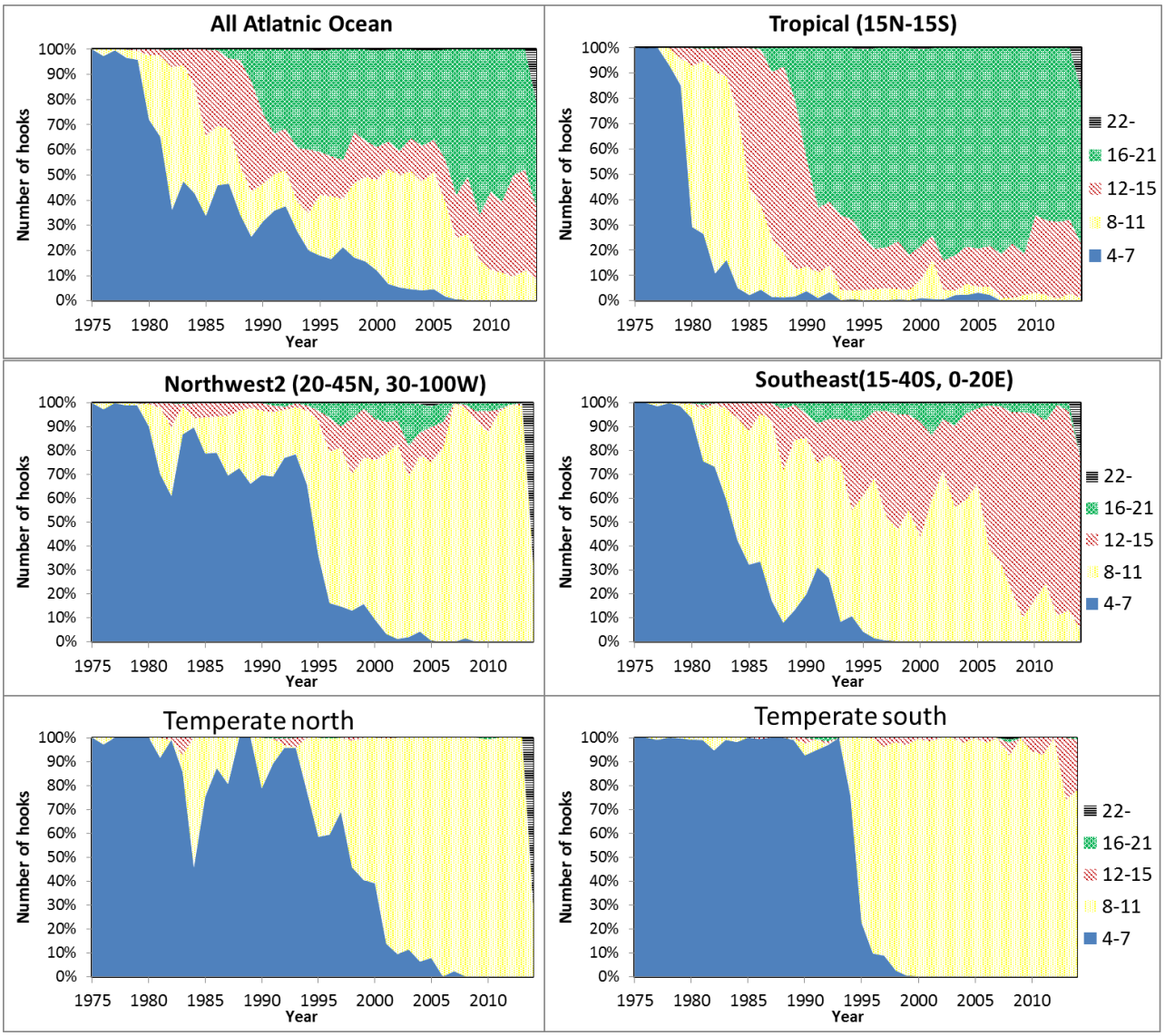

Figure 11. Change in the proportion of fishing effort (number of hooks) by each category of number of hooks between floats in several areas.