

STATISTICS OF THE FRENCH PURSE SEINE FISHING FLEET TARGETING TROPICAL TUNAS IN THE INDIAN OCEAN (1981-2017)

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SUMMARY

In 2017, a total of 13 French vessels operated in the eastern Indian Ocean including 12 purse seiners and 1 supply vessel deploying FAD and managing a part of the French FAD stock at sea. The total capacity weighted by the months of activity for each vessel is 11944 t. The total nominal effort in 2017 was of 2928 fishing days and 2839 sets with 2150 sets on floating objects and 689 on free schools. In 2017, the percentage of sets was 76% and the catches reached 78% on Floating Object. The total catch of the French component of the EU purse seine fleet of the Indian Ocean was 66,945 t, being composed of 45%, 48%, and 7% of yellowfin tuna, skipjack tuna, and bigeye tuna respectively.

KEYWORDS : *Tropical tuna fisheries, French purse seining, free swimming school, fish aggregating devices, *Katsuwonus pelamis*, *Thunnus albacares*, *Thunnus obesus**

1 Introduction

French tuna purse seiners have been fishing yellowfin tuna (*Thunnus albacares*), skipjack tuna (*Katsuwonus pelamis*), and bigeye tuna (*Thunnus obesus*) in the Indian Ocean since the early 1980s. Tuna schools are harvested through two major fishing modes that result in different species and size composition of the catch, i.e. tunas in free-swimming schools (FSC) and tunas associated with drifting Floating Objects (FOB) now predominated by artificial Fish Aggregating Devices (FAD). The French purse seine fishery activities and catches are monitored by the 'Institut de Recherche pour le Développement' (IRD) since the late 1980s in collaboration with the 'Seychelles Fishing Authority' (SFA). Here, we report a synthesis of the fishing activities of the French purse seiners during the period 1981-2017 based on the collection of logbooks and landing reports and sampling operations conducted at ports during unloading for target species (i.e skipjack, yellowfin tuna and bigeye tuna) which are analysed with the T3 process.

2 Material and methods

2.1 Fishing data from professional activities

Logbooks and sale reports were collected in collaboration with fishing companies and covered 100% of the fishing trips that occurred during 1981-2017. For each trip, at unloading, shipment was sort by species (and by commercial categories) and weight at the cannery. For each sets, vessels crew reported in the logbook all information on their activities including:

- Catch weight visually assessed
- Raw species composition of the sets visually assessed
- Date of the sets;
- Geographic location of the sets.

2.2 Sampling

In 2017, 238 well samples were collected at unloading of French purse seiners in the ports of Victoria. These samples were used to estimate the size and species composition of the catch following a sampling and

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processing protocol common with purse seiners flying the flag of Spain and other flags associated with the French purse seine fleet (Pallarès and Petit, 1998). A total of about 96 000 tunas counted and measured were used in the T3 (Traitement des Thons Tropicaux) processing of the French purse seine fishery data for 2017 (Duparc et al., 2018).

2.3 *Fishing effort*

Nominal fishing effort was derived from logbooks and expressed in days-at-sea and fishing days considering that fishing operations for purse seiners occur only during daylight. Searching time (days), which accounts for the expected time required for setting the purse seine, was also used to describe the nominal purse seine effort. In Indian Ocean, the maximum duration of a day for the purse seine fishing fleet targeting tropical tunas is 13 hours.

3 **Results and interpretations**

3.1 *Fleet capacity*

In 2017, 12 French purse seiners (Fig. 1) operated in the Indian Ocean and conducted a total of 136 fishing trips lasting 26 days on average. The fleet was composed of 11 vessels of CC 800-1200 t, and 1 vessel of CC >1,200 t (Table 1). Total carrying capacity in 2017 is similar to the last years and confirm the trend to use larger vessels. The total capacity weighted by the months of activity for each vessel is 11 944 t. Thus total carrying capacity continue the trend of slightly decrease (except for the 2006-2008 period)

In addition, one supply vessel has been operating in the Indian Ocean since the 2016 in support of French purse seiners. Support vessel's activities mainly consist in searching for tuna schools and both deploying and managing the stock of FADs and associated buoys through deployment of FADs, visits and retrieval of some buoys or FADs that drift outside the purse seine fishing grounds. The French support vessel spent a total of 233 days at sea in 2017, contributing to 5.5% of the cumulated days at sea of the French fishing fleet (purse seiners and supply vessel).

3.2 *Activity effort*

The total nominal effort in 2017 for fishing and searching was respectively about 2,900 and 2,500 days (Fig. 2 and Table 2) which is similar to the trend of the last years. Since 2010, activities duration slightly decrease due to the departure of 5 vessels in Atlantic Ocean.

3.3 *Fishing set*

The total annual number of fishing sets in 2017 reached 2839 (2410 positive sets and 429 null sets). A total of 2150 sets were associated to FOBs (combine FADs) and 689 sets associated to free swimming schools (FSC) (Table 4). The proportion of positive sets is 93% on FOBs and 71% on FSC. In 2017, the percentage of FOB sets is the highest value estimated since the beginning of the fishery with 76% (Fig.3) that corresponds to an increase of 9% compare to 2016.

3.4 Fisheries production, specific composition and size distribution

In 2017, landings of the main marketable tuna species (SKJ, YFT, BET) for the French purse seine fleet operating in the Indian Ocean reached a total of 66,945 t corresponding to a slight decrease of 2% compared to 2016 (Fig.4). Those landings are composed of 45%, 48% and 7% of yellowfin, skipjack, bigeye tunas respectively (see details in table 5 and 6). Since 2010, the production is quite stable with an average of 64,000 t associated to 12 vessels.

Catch composition on FSC was usually dominated by yellowfin tuna where as it was dominated by skipjack tuna on FOB. In 2017, catches on FSC, yellowfin tuna represented 82% of the total while skipjack and bigeye tunas represented 6% and 12% of catches, respectively (Fig.5). Catches on FOB were predominated by skipjack tuna representing 60% of the catch while yellowfin and bigeye tunas represented 35% and 5% of catches, respectively. Finally, species composition values were quite similar to last year's species composition whatever the school type.

The size frequency distributions for the three species collected in 2017 either for both FOB-associated and FSC fishing sets are quite similar with the average frequency distributions observed for the period 2012-2016 (Fig.6). Considering the mean weight of landed fish, it seems the average weight continue to increase for every species in FSC catches only (Fig.7). However, yellowfin caught seemed to be smaller in 2017 than in the 2014-2016 period, which support the results on size distribution.

3.5 Spatial distribution of fishing

Spatial extent used by vessels increased in 2017 following the trend since 2015 (Figure 12, Table 3). We could so conclude that the supplementary zone used by vessels served for other activities as FAD management or exploration. Figure 8 to 12 respectively represent maps of the fishing effort and catches on FOB and FSC.

4 Conclusion

Fisheries activities of the French fleet in Indian Ocean in 2017 was in the continuity of these last years in many aspects: fleet capacity, fishing effort and catch production. However, an increase of the percentage of catches on FOB which reach 78% this year. Catch yellowfin tuna seemed to be smaller since these two last years, which could explain the decrease in fishing yield during the same period. This new trends have to be confirm with the next years.

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5 References

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Pallarés, P., and C. Petit. 1998. Tropical tunas : new sampling and data processing strategy for estimating the composition of catches by species and sizes. Collect. Vol. Sci. Pap. ICCAT 48:230–246.

6 Figures

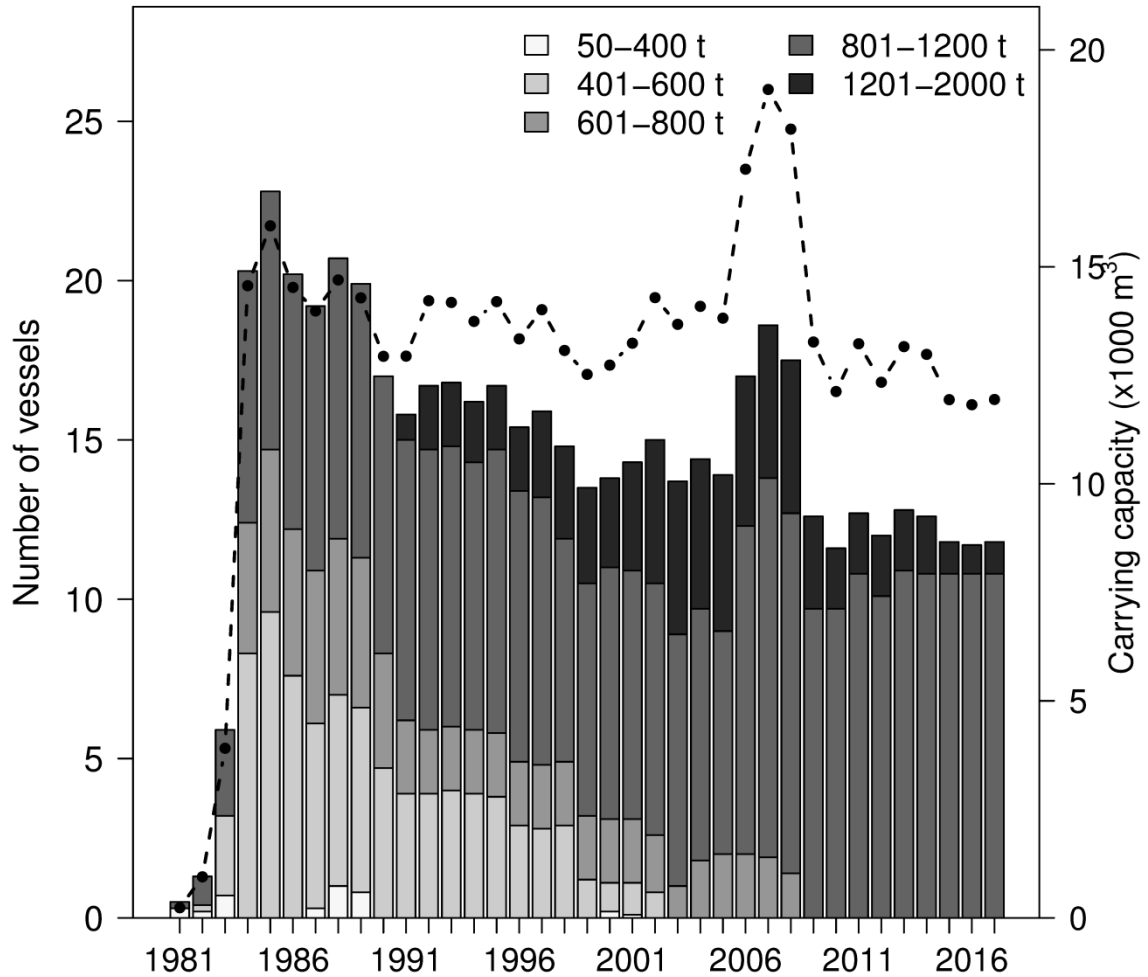


Figure 1 Fishing capacity of the French purse seine fishing fleet in the Indian Ocean. Annual changes in the number of purse seiners by tonnage category (barplots) and total carrying capacity (dashed line with circles) during 1981-2017.

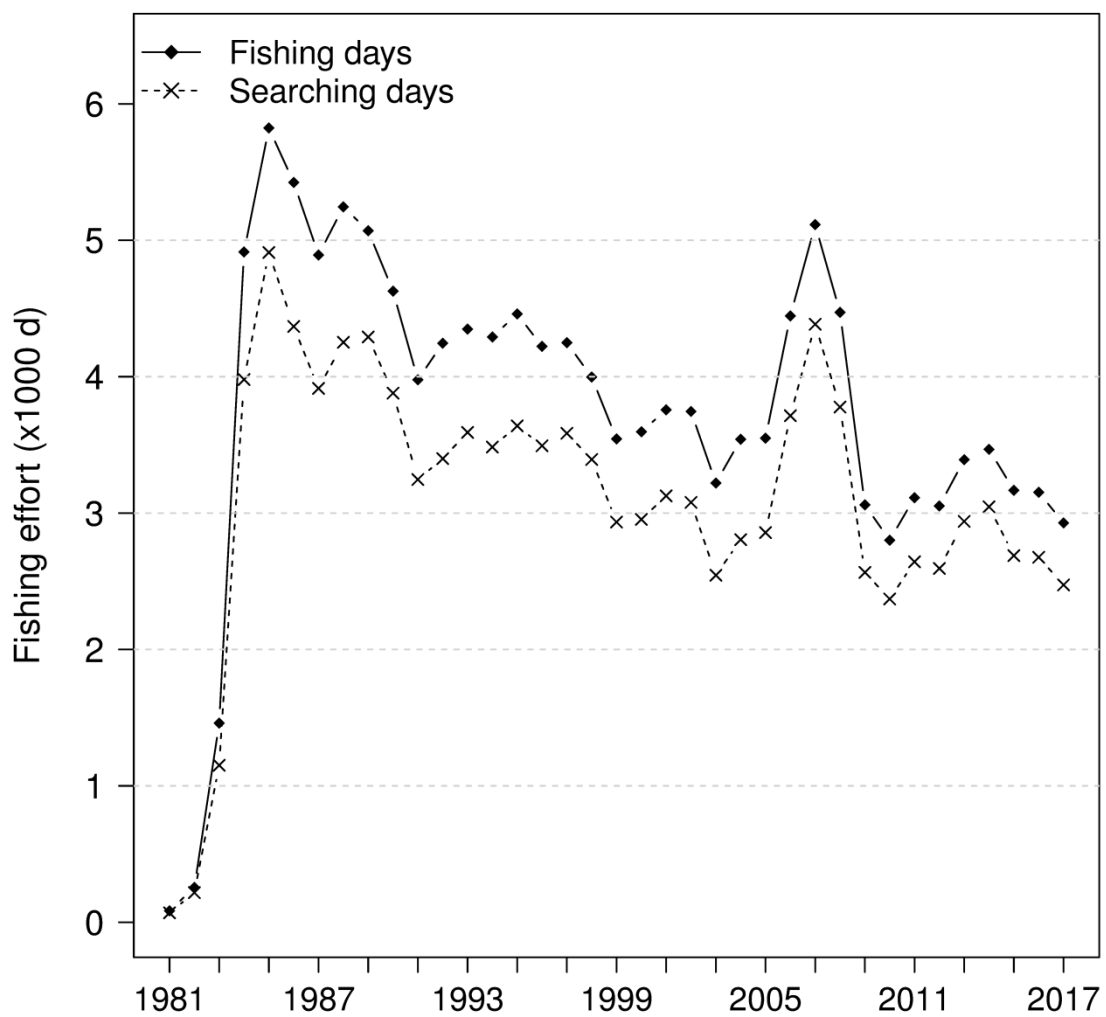


Figure 2 Changes in nominal effort over time. Annual total number of fishing and searching days for the French purse seine fishing fleet in the Indian Ocean during 1981-2017

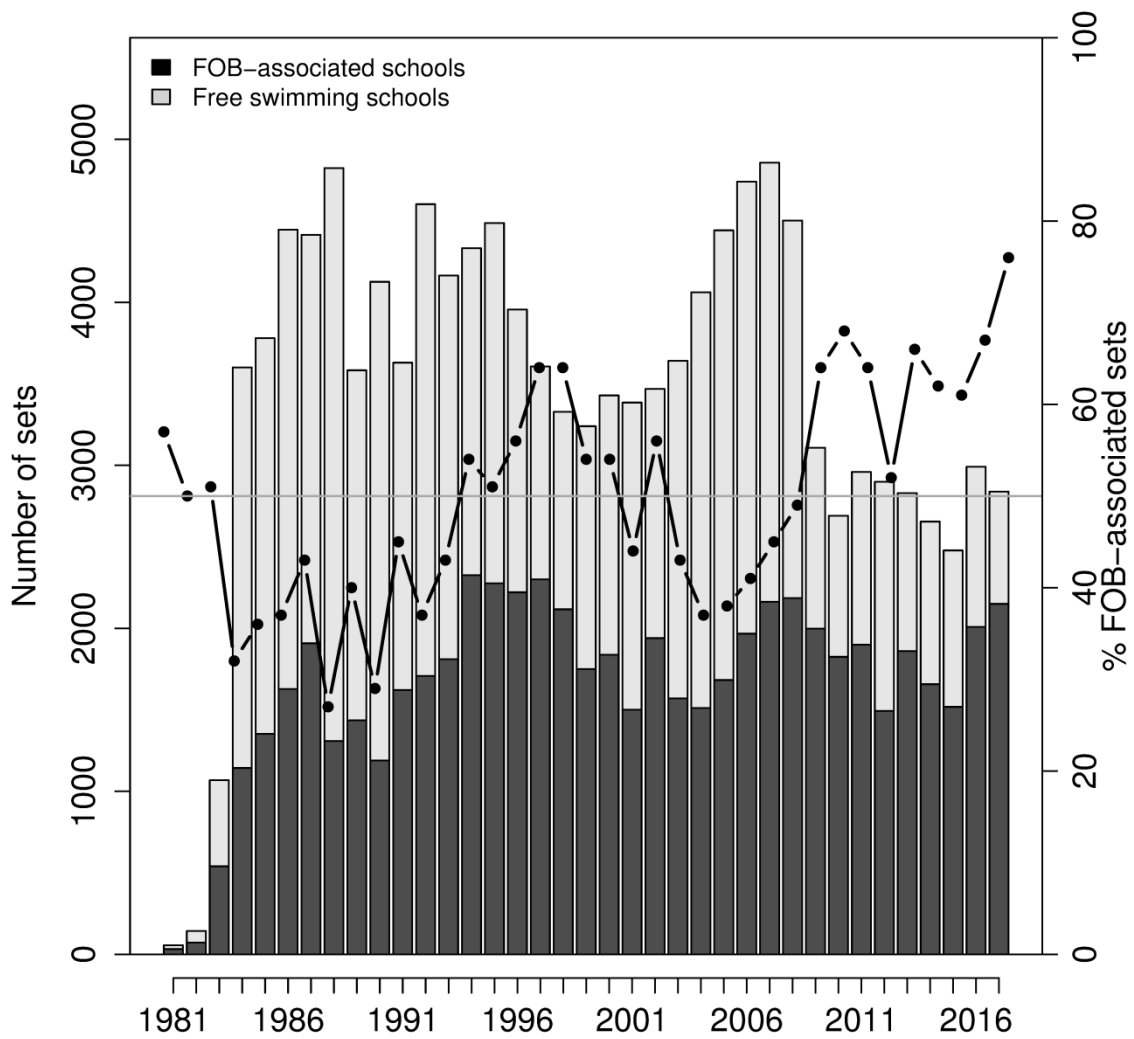


Figure 3 Fishing operations. Annual number of fishing sets in the French purse seine fishery on FOB-associated and free-swimming schools during 1981-2017. Line with solid circles indicates the percentage of sets on FOB-associated schools. Grey solid line indicates the 50% value.

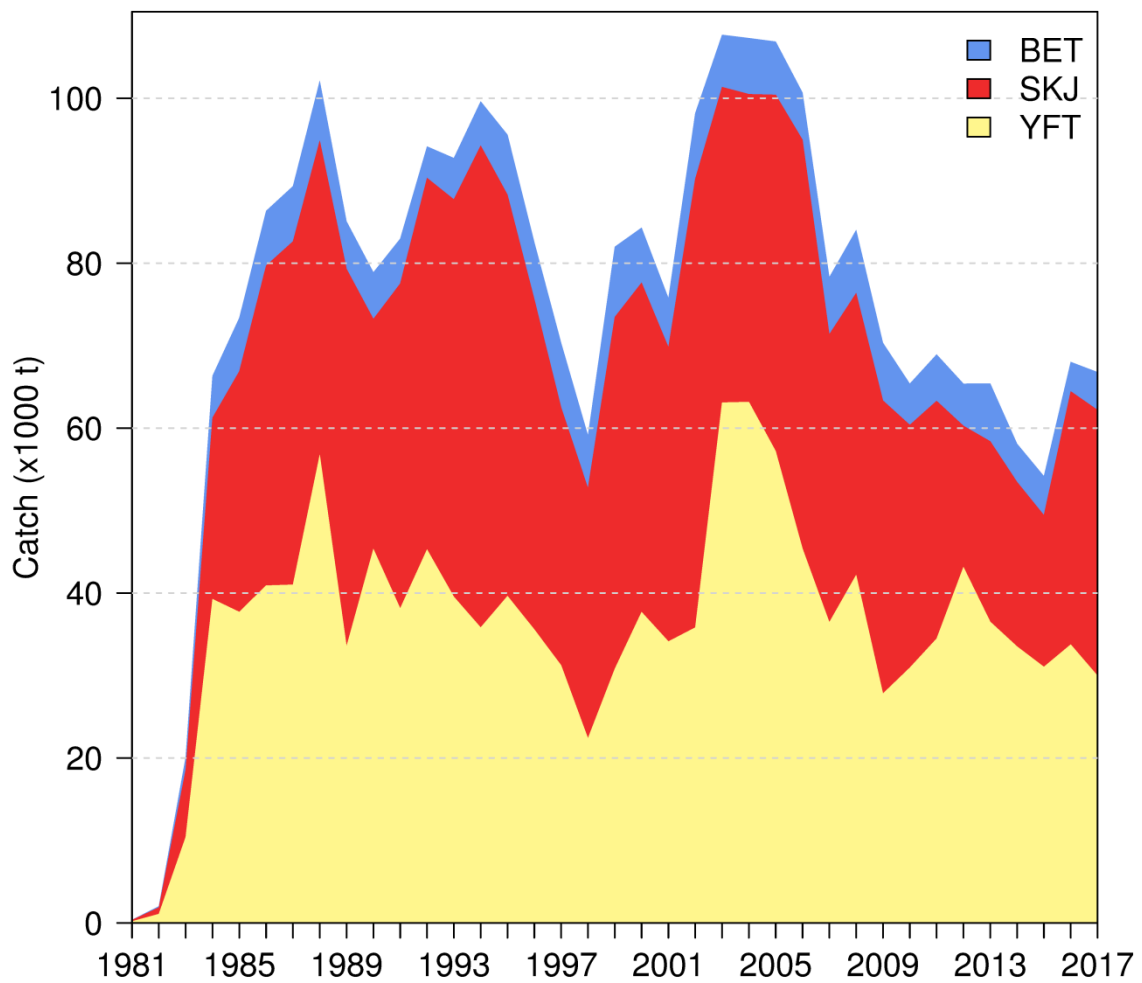


Figure 4 Total fishery production. Catch by species of the French purse seine fishing fleet during 1981-2017

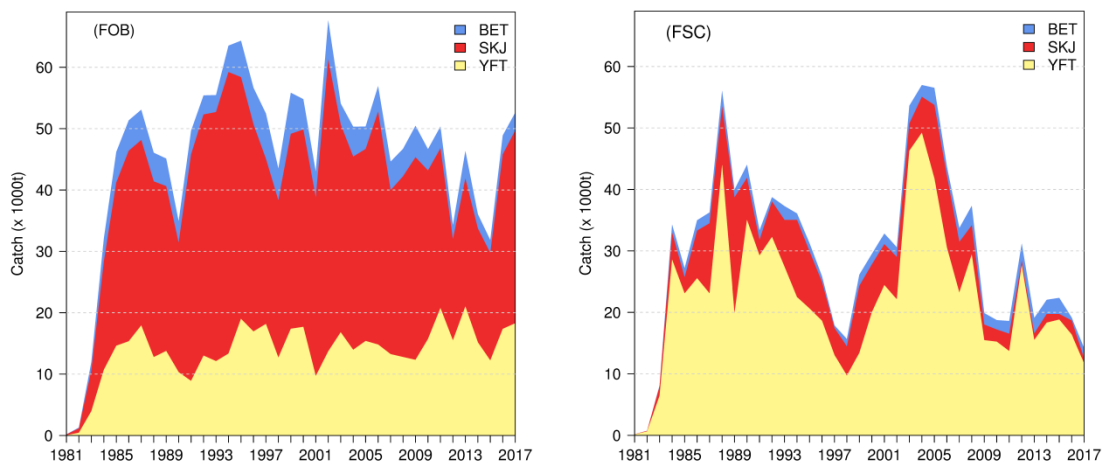


Figure 5 Fishery production by major fishing mode. Catch by species of the French purse seine fishing fleet on FOB-associated and free-swimming schools during 1981-2017

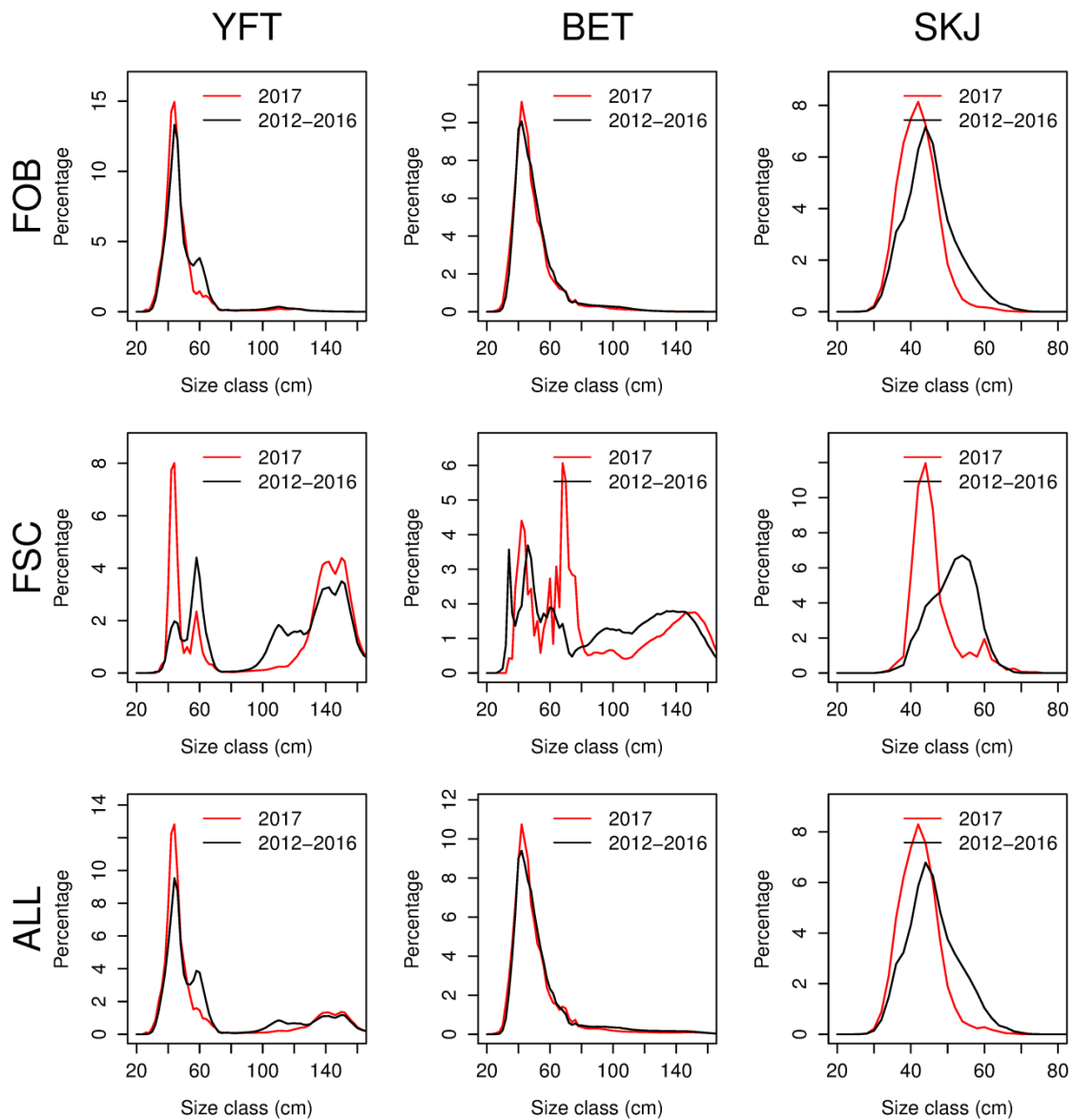


Figure 6 Distribution by size class of the catch (in percentage of the total number of fishes) for the French purse seine fleet in 2017 (red line) and for an average year representing the period 2012-2016 (black line)

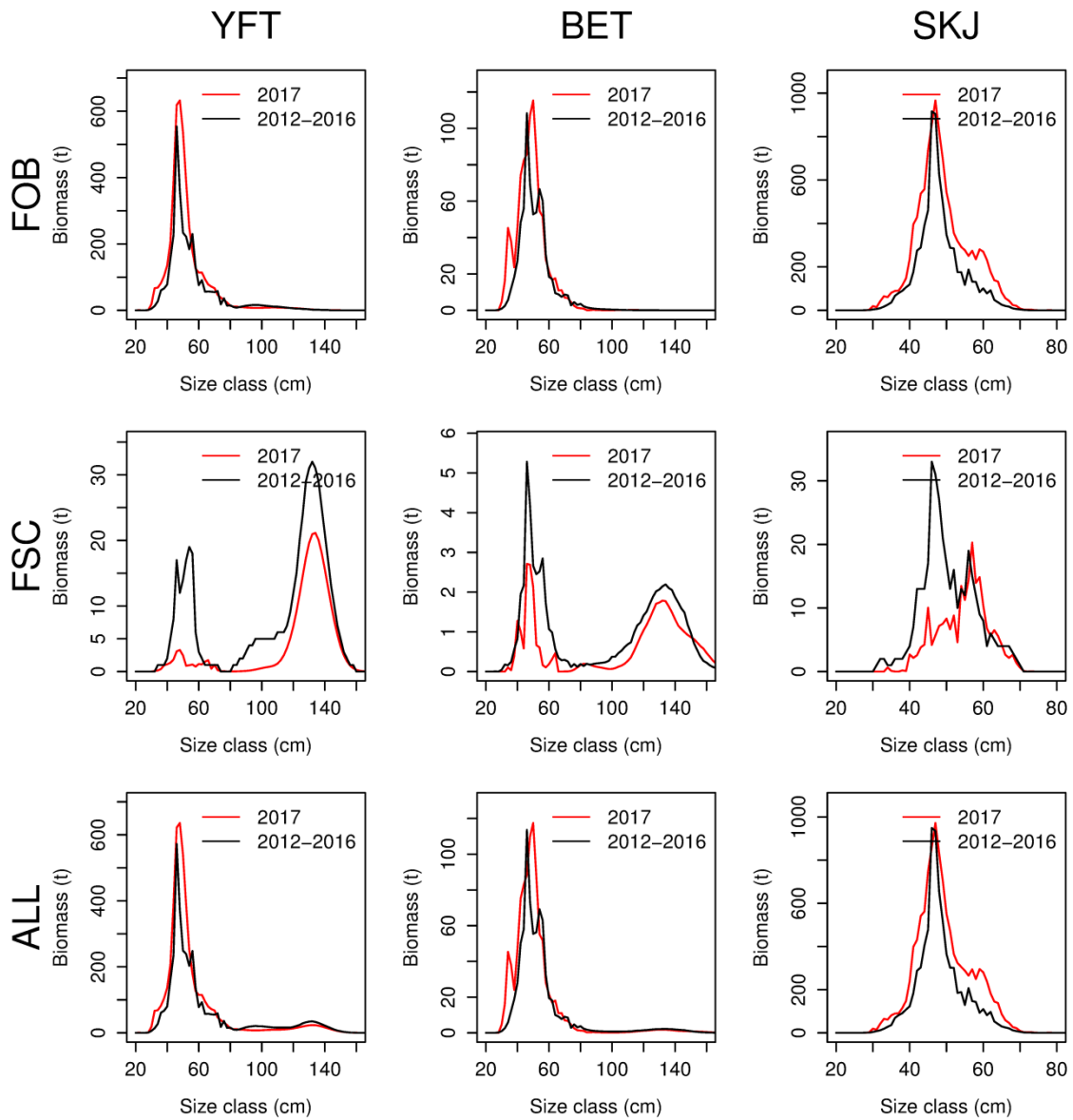


Figure 7 Size distributions in biomass of individuals by species and by fishing mode for the French purse seine fleet in 2017 (red line) and for an average year representing the period 2012-2016 (black line)

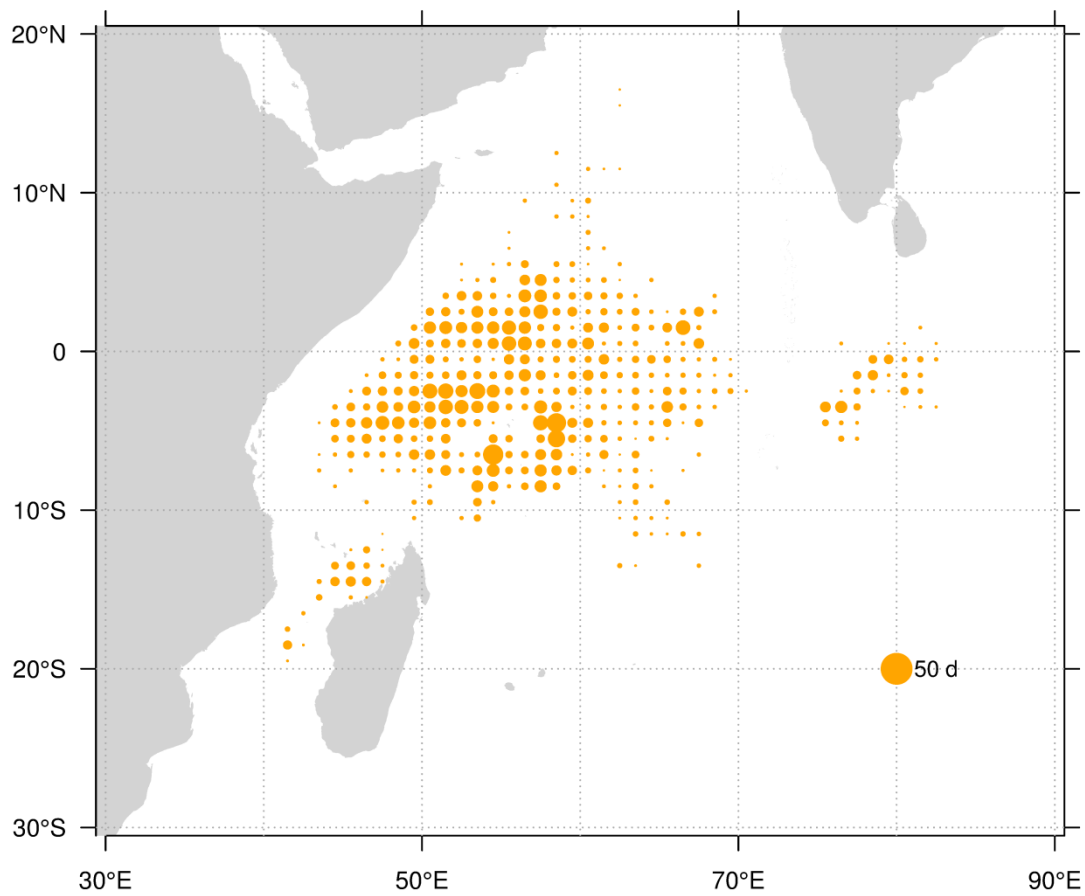


Figure 8 Fishing grounds. Spatial distribution of fishing effort (in searching days) of the French purse seine fishing fleet in 2017

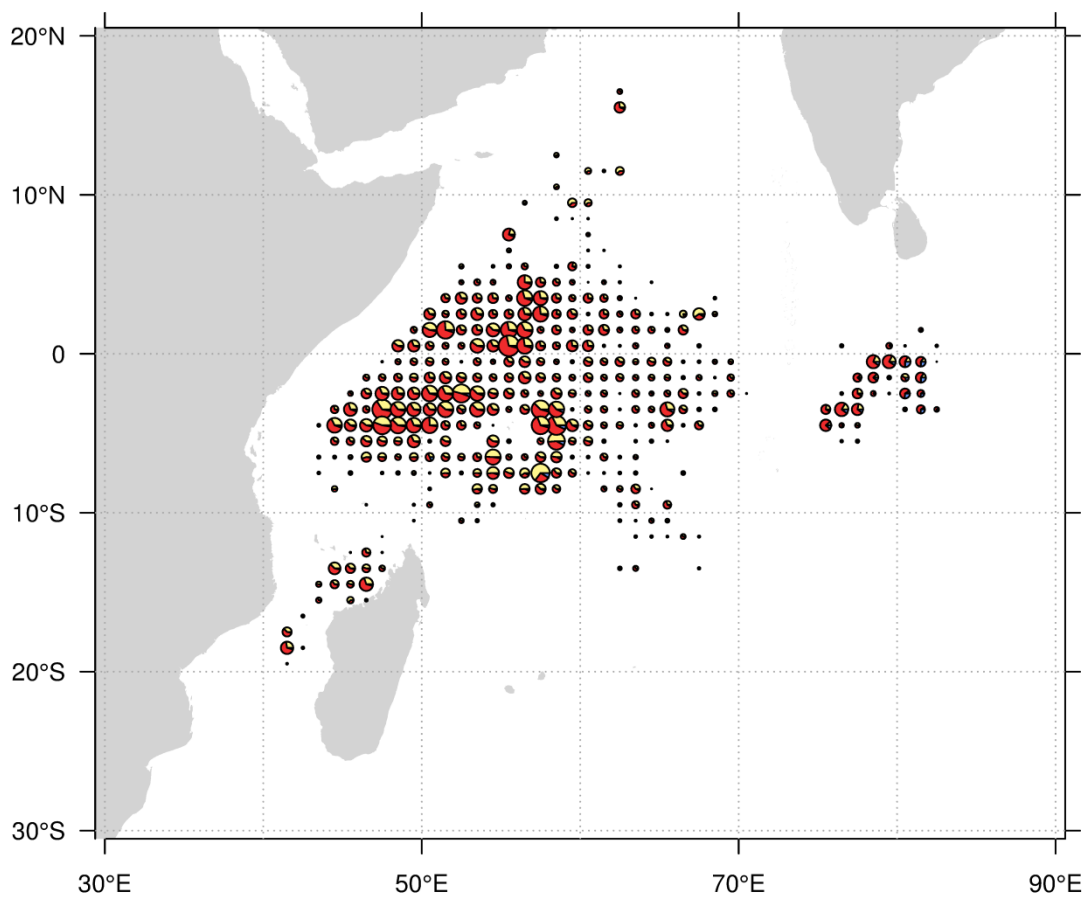


Figure 9 Spatial distribution of tuna catches of the French purse seine fishing fleet made on FOB-associated schools in 2017

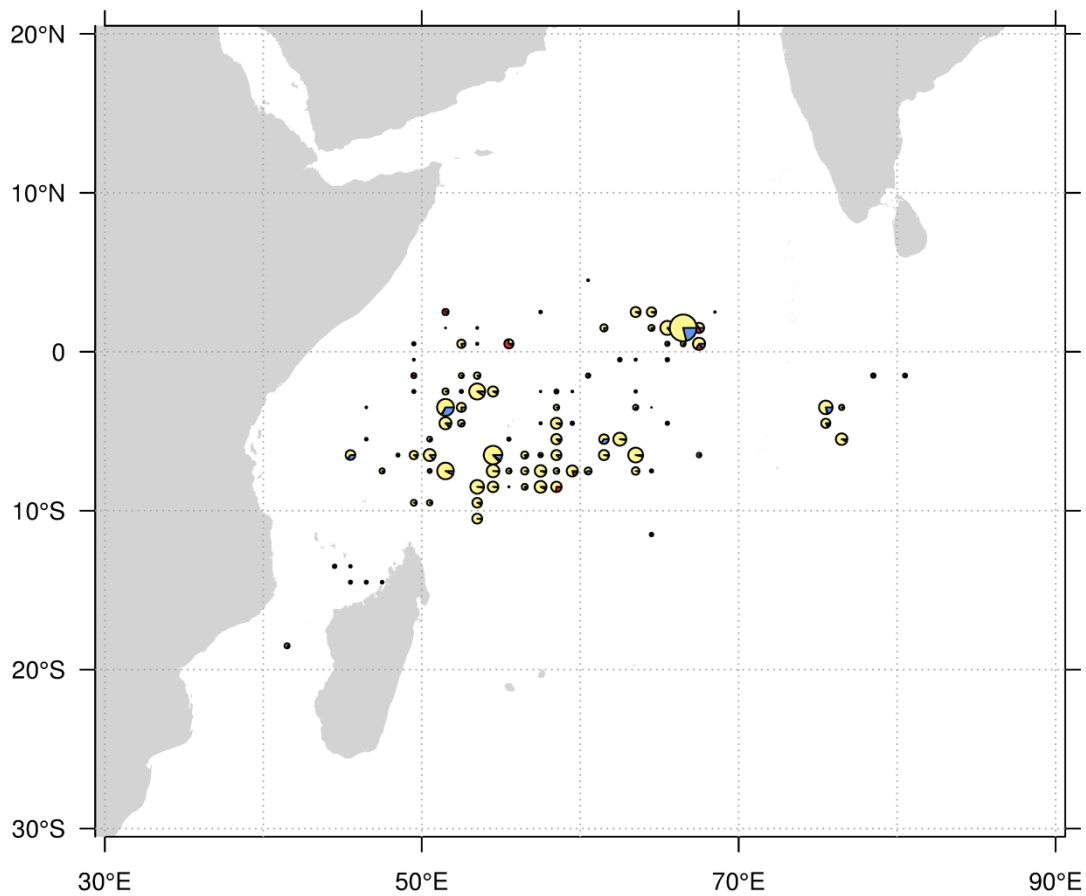


Figure 10 Spatial distribution of tuna catches of the French purse seine fishing fleet made on FSC-associated schools in 2017

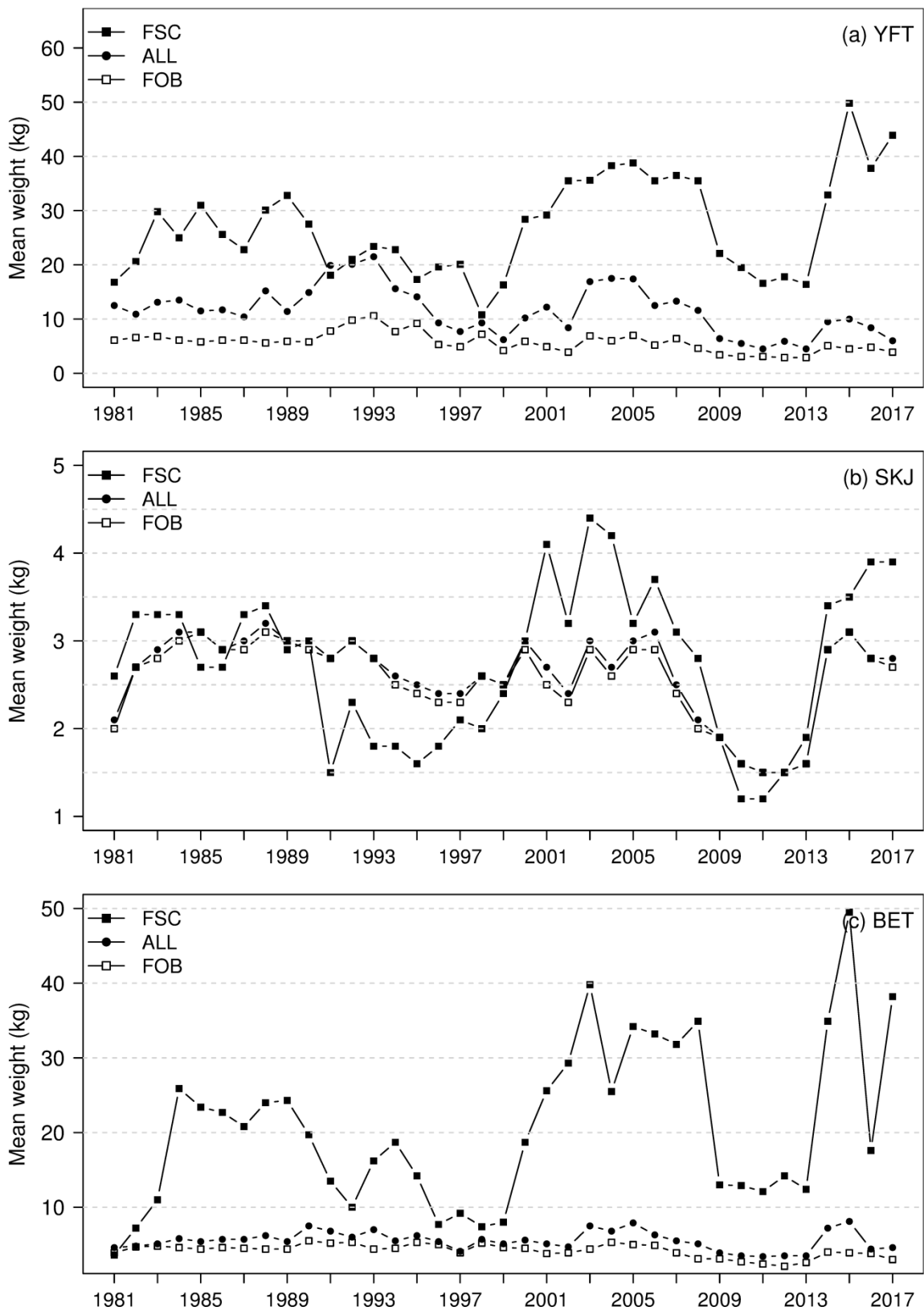


Figure 11 Annual time series of mean weight (kg) for (a) yellow Fin, (b) skipjack, and (c) bigeye tuna for each fishing mode during 1981-2017

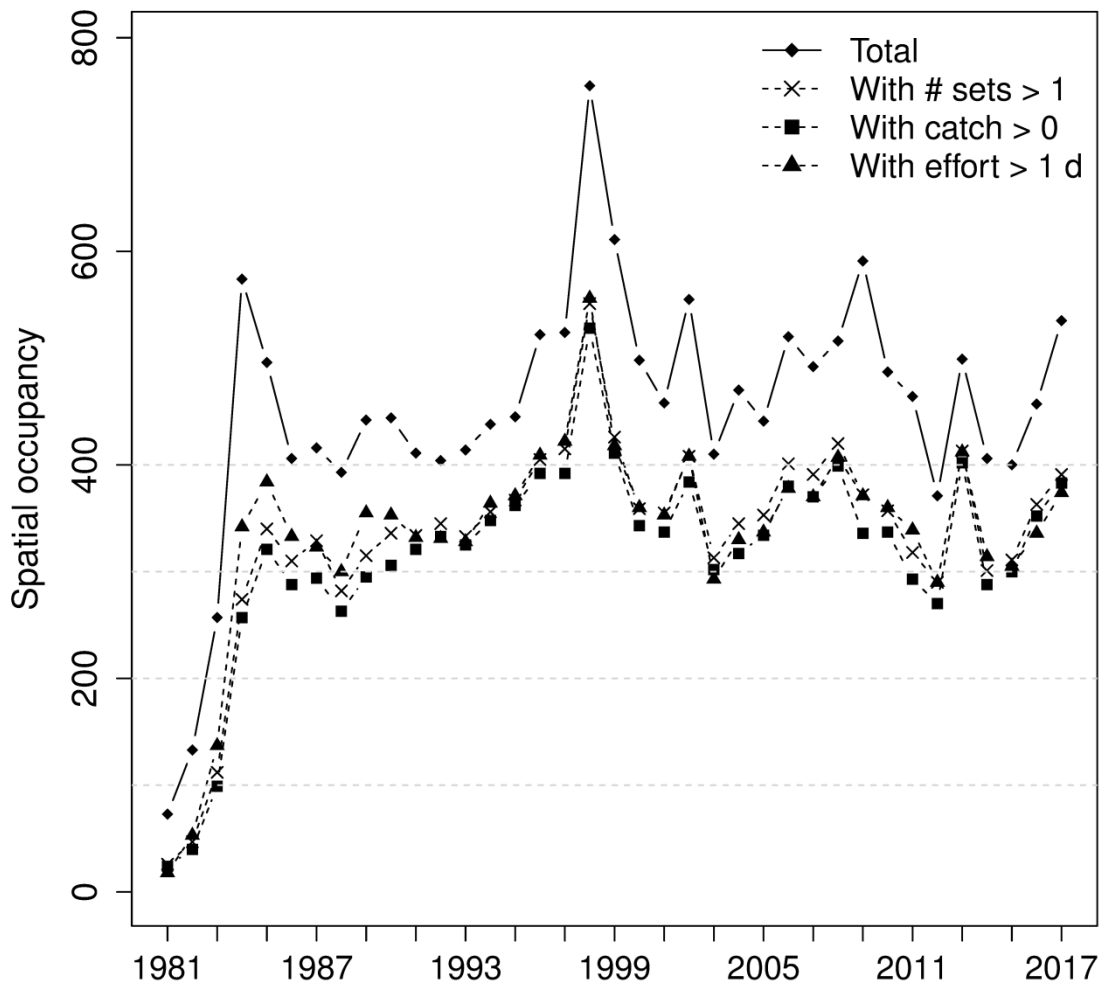


Figure 12 Changes in spatial extent of the Fishery over time. Mean annual number of 1-degree squares explored by each vessel of the French purse seine Fishing Fleet during 1981-2017.

7 Tables

Table 1 Annual number of purse seiners by size category and total carrying capacity of the European tropical tuna purse seine fishing fleet of the Indian Ocean during 1981-2017. Total carrying capacity (CC) was weighted by the proportion of the year at sea (in months)

| Year | 50-400 | 401-600 | 601-800 | 801-1200 | 1201-2000 | >2000 | Nb vessels | Nb vessels weighted | CC |
|------|--------|---------|---------|----------|-----------|-------|------------|---------------------|-------|
| 1991 | 1.2 | 7.7 | 4.1 | 4.5 | 0 | 0 | 23 | 17.42 | 11850 |
| 1992 | 1 | 7.6 | 2 | 5.5 | 0 | 0 | 17 | 16.08 | 11457 |
| 1993 | 0.9 | 7.4 | 2.1 | 5.9 | 0 | 0 | 18 | 16.33 | 11870 |
| 1994 | 0.8 | 7.8 | 2.7 | 5.6 | 0 | 0 | 18 | 16.83 | 12121 |
| 1995 | 0 | 7.9 | 2 | 5 | 0 | 0 | 17 | 14.92 | 10863 |
| 1996 | 0 | 8.8 | 2 | 4.9 | 0 | 0 | 16 | 15.75 | 11243 |
| 1997 | 0 | 7.3 | 1.8 | 5 | 0.7 | 0 | 19 | 14.67 | 11331 |
| 1998 | 0 | 6.9 | 2 | 5.7 | 0 | 0 | 15 | 14.58 | 11071 |
| 1999 | 0 | 7.2 | 1.8 | 5 | 0 | 0 | 15 | 14 | 10538 |
| 2000 | 0 | 6.9 | 1.6 | 5 | 0 | 0 | 14 | 13.5 | 10248 |
| 2001 | 0 | 6.2 | 1.8 | 5.3 | 0.8 | 0 | 17 | 14 | 11314 |
| 2002 | 0 | 6.8 | 0.3 | 4.8 | 0.4 | 0 | 17 | 12.25 | 9601 |
| 2003 | 0 | 6.6 | 1 | 4.8 | 0 | 0 | 14 | 12.42 | 9610 |
| 2004 | 0 | 4.9 | 0.3 | 4.9 | 0 | 0 | 12 | 10.08 | 8345 |
| 2005 | 0 | 3.9 | 0 | 4.3 | 0 | 0 | 9 | 8.25 | 6980 |
| 2006 | 0 | 3.4 | 0 | 2 | 0 | 0 | 7 | 5.42 | 4040 |
| 2007 | 0.3 | 2.8 | 0 | 1.8 | 0 | 0 | 6 | 4.92 | 3609 |
| 2008 | 0 | 2.3 | 0.6 | 1.8 | 0 | 0 | 7 | 4.67 | 3678 |
| 2009 | 0 | 0.9 | 2 | 3 | 1.4 | 0 | 10 | 7.33 | 6876 |
| 2010 | 0 | 1 | 1.9 | 3.9 | 2.3 | 0 | 10 | 9.08 | 8846 |
| 2011 | 0 | 0.8 | 2 | 3.5 | 1.9 | 0 | 9 | 8.17 | 7945 |
| 2012 | 0 | 0 | 1.9 | 4.8 | 1.9 | 0 | 9 | 8.67 | 8986 |
| 2013 | 0 | 0 | 1.9 | 4.7 | 1.8 | 0 | 9 | 8.42 | 8715 |
| 2014 | 0 | 0 | 2 | 5 | 1.9 | 0 | 9 | 8.92 | 9240 |
| 2015 | 0 | 0 | 1.8 | 5 | 1.9 | 0 | 9 | 8.75 | 9118 |
| 2016 | 0 | 0 | 2 | 5.5 | 2 | 0 | 11 | 9.5 | 9780 |
| 2017 | 0 | 0 | 2 | 5.8 | 1.8 | 0 | 10 | 9.58 | 9756 |

Table 2 Annual nominal fishing effort of the French purse seine fishing fleet expressed in fishing and searching days during 1981-2017. Searching days was derived from the total time spent at sea corrected for periods of damage, route towards port, and purse seine operation. The duration per day for fishing activities is 12 hours

| Year | CC | Fishing days | Searching days |
|-------------|-----------|---------------------|-----------------------|
| 1981 | 233 | 84 | 69 |
| 1982 | 945 | 255 | 217 |
| 1983 | 3907 | 1460 | 1151 |
| 1984 | 14566 | 4914 | 3979 |
| 1985 | 15945 | 5823 | 4910 |
| 1986 | 14526 | 5424 | 4368 |
| 1987 | 13983 | 4892 | 3914 |
| 1988 | 14699 | 5245 | 4252 |
| 1989 | 14285 | 5069 | 4291 |
| 1990 | 12939 | 4627 | 3879 |
| 1991 | 12943 | 3977 | 3246 |
| 1992 | 14220 | 4245 | 3399 |
| 1993 | 14180 | 4349 | 3591 |
| 1994 | 13743 | 4291 | 3484 |
| 1995 | 14199 | 4460 | 3639 |
| 1996 | 13341 | 4222 | 3493 |
| 1997 | 14013 | 4249 | 3585 |
| 1998 | 13074 | 3997 | 3393 |
| 1999 | 12523 | 3543 | 2934 |
| 2000 | 12736 | 3596 | 2954 |
| 2001 | 13311 | 3757 | 3126 |
| 2002 | 14431 | 3745 | 3078 |
| 2003 | 13676 | 3220 | 2544 |
| 2004 | 14090 | 3541 | 2805 |
| 2005 | 13818 | 3549 | 2857 |
| 2006 | 17250 | 4445 | 3714 |
| 2007 | 19087 | 5115 | 4384 |
| 2008 | 18173 | 4471 | 3777 |
| 2009 | 13270 | 3060 | 2565 |
| 2010 | 12128 | 2801 | 2370 |
| 2011 | 13229 | 3113 | 2643 |
| 2012 | 12341 | 3052 | 2594 |
| 2013 | 13162 | 3391 | 2939 |
| 2014 | 12984 | 3467 | 3046 |
| 2015 | 11940 | 3167 | 2688 |
| 2016 | 11823 | 3152 | 2676 |
| 2017 | 11944 | 2928 | 2473 |

Table 3 Annual number of 1-degree squares explored by the French purse seine fishing fleet during 1981-2017. #sets indicates squares where a least 1 fishing set was made.

| Year | TOTAL | #sets | Catch >0 | Effort > 1 d | Effort > 5 d |
|-------------|--------------|--------------|--------------------|------------------------|------------------------|
| 1981 | 73 | 26 | 24 | 18 | 0 |
| 1982 | 133 | 47 | 40 | 53 | 10 |
| 1983 | 257 | 112 | 99 | 137 | 60 |
| 1984 | 574 | 274 | 257 | 342 | 182 |
| 1985 | 496 | 340 | 321 | 384 | 267 |
| 1986 | 406 | 310 | 288 | 333 | 223 |
| 1987 | 416 | 329 | 294 | 323 | 206 |
| 1988 | 393 | 282 | 263 | 300 | 210 |
| 1989 | 442 | 315 | 295 | 355 | 229 |
| 1990 | 444 | 336 | 306 | 353 | 215 |
| 1991 | 411 | 334 | 321 | 332 | 203 |
| 1992 | 404 | 345 | 333 | 331 | 198 |
| 1993 | 414 | 333 | 325 | 328 | 218 |
| 1994 | 438 | 356 | 348 | 364 | 231 |
| 1995 | 445 | 367 | 362 | 371 | 232 |
| 1996 | 522 | 405 | 392 | 409 | 245 |
| 1997 | 524 | 415 | 392 | 422 | 258 |
| 1998 | 755 | 551 | 528 | 556 | 245 |
| 1999 | 611 | 426 | 411 | 418 | 196 |
| 2000 | 498 | 359 | 343 | 360 | 201 |
| 2001 | 458 | 355 | 337 | 353 | 219 |
| 2002 | 555 | 408 | 384 | 408 | 237 |
| 2003 | 410 | 313 | 302 | 293 | 186 |
| 2004 | 470 | 345 | 317 | 330 | 171 |
| 2005 | 441 | 353 | 334 | 337 | 198 |
| 2006 | 520 | 401 | 380 | 378 | 220 |
| 2007 | 492 | 391 | 370 | 370 | 242 |
| 2008 | 516 | 420 | 399 | 407 | 245 |
| 2009 | 591 | 372 | 336 | 371 | 189 |
| 2010 | 487 | 357 | 337 | 360 | 186 |
| 2011 | 464 | 318 | 293 | 339 | 162 |
| 2012 | 371 | 290 | 270 | 290 | 184 |
| 2013 | 499 | 413 | 402 | 412 | 221 |
| 2014 | 406 | 301 | 288 | 314 | 190 |
| 2015 | 400 | 311 | 300 | 305 | 182 |
| 2016 | 457 | 363 | 352 | 336 | 186 |
| 2017 | 535 | 391 | 383 | 374 | 210 |

Table 4 Number of positive and null sets by fishing mode made by the French purse seine fishing fleet in the Indian ocean during 1981-2017. FOB = Floating Object; FSC = Free-Swimming School

| | ALL | | | FOB | | | FSC | | | |
|------|------------|----------|------|------------|----------|------|------------|----------|------|----|
| | Total | Positive | Null | Total | Positive | Null | Total | Positive | Null | |
| 1981 | 56 | 37 | 19 | 32 | 24 | 8 | 24 | 13 | 11 | 57 |
| 1982 | 143 | 105 | 38 | 72 | 63 | 9 | 71 | 42 | 29 | 50 |
| 1983 | 1068 | 738 | 330 | 540 | 449 | 91 | 528 | 289 | 239 | 51 |
| 1984 | 3601 | 2077 | 1524 | 1143 | 888 | 255 | 2458 | 1189 | 1269 | 32 |
| 1985 | 3780 | 2108 | 1672 | 1353 | 1118 | 235 | 2427 | 990 | 1437 | 36 |
| 1986 | 4446 | 2257 | 2189 | 1628 | 1282 | 346 | 2818 | 975 | 1843 | 37 |
| 1987 | 4414 | 2592 | 1822 | 1908 | 1520 | 388 | 2506 | 1072 | 1434 | 43 |
| 1988 | 4824 | 2648 | 2176 | 1309 | 1104 | 205 | 3515 | 1544 | 1971 | 27 |
| 1989 | 3583 | 2083 | 1500 | 1436 | 1213 | 223 | 2147 | 870 | 1277 | 40 |
| 1990 | 4126 | 2322 | 1804 | 1189 | 991 | 198 | 2937 | 1331 | 1606 | 29 |
| 1991 | 3630 | 2448 | 1182 | 1622 | 1538 | 84 | 2008 | 910 | 1098 | 45 |
| 1992 | 4602 | 2980 | 1622 | 1708 | 1569 | 139 | 2894 | 1411 | 1483 | 37 |
| 1993 | 4164 | 2764 | 1400 | 1811 | 1612 | 199 | 2353 | 1152 | 1201 | 43 |
| 1994 | 4332 | 3099 | 1233 | 2326 | 2068 | 258 | 2006 | 1031 | 975 | 54 |
| 1995 | 4486 | 3066 | 1420 | 2276 | 2052 | 224 | 2210 | 1014 | 1196 | 51 |
| 1996 | 3956 | 2883 | 1073 | 2221 | 1956 | 265 | 1735 | 927 | 808 | 56 |
| 1997 | 3607 | 2714 | 893 | 2301 | 2035 | 266 | 1306 | 679 | 627 | 64 |
| 1998 | 3328 | 2454 | 874 | 2117 | 1828 | 289 | 1211 | 626 | 585 | 64 |
| 1999 | 3240 | 2371 | 869 | 1750 | 1553 | 197 | 1490 | 818 | 672 | 54 |
| 2000 | 3429 | 2526 | 903 | 1838 | 1568 | 270 | 1591 | 958 | 633 | 54 |
| 2001 | 3385 | 2370 | 1015 | 1501 | 1321 | 180 | 1884 | 1049 | 835 | 44 |
| 2002 | 3469 | 2539 | 930 | 1940 | 1745 | 195 | 1529 | 794 | 735 | 56 |
| 2003 | 3641 | 2344 | 1297 | 1570 | 1357 | 213 | 2071 | 987 | 1084 | 43 |
| 2004 | 4062 | 2382 | 1680 | 1511 | 1275 | 236 | 2551 | 1107 | 1444 | 37 |
| 2005 | 4442 | 2862 | 1580 | 1683 | 1473 | 210 | 2759 | 1389 | 1370 | 38 |
| 2006 | 4741 | 3000 | 1741 | 1967 | 1696 | 271 | 2774 | 1304 | 1470 | 41 |
| 2007 | 4857 | 2909 | 1948 | 2163 | 1698 | 465 | 2694 | 1211 | 1483 | 45 |
| 2008 | 4502 | 2954 | 1548 | 2186 | 1850 | 336 | 2316 | 1104 | 1212 | 49 |
| 2009 | 3108 | 2339 | 769 | 1998 | 1714 | 284 | 1110 | 625 | 485 | 64 |
| 2010 | 2691 | 2019 | 672 | 1825 | 1590 | 235 | 866 | 429 | 437 | 68 |
| 2011 | 2959 | 2144 | 815 | 1900 | 1631 | 269 | 1059 | 513 | 546 | 64 |
| 2012 | 2899 | 2107 | 792 | 1493 | 1276 | 217 | 1406 | 831 | 575 | 52 |
| 2013 | 2830 | 2125 | 705 | 1860 | 1629 | 231 | 970 | 496 | 474 | 66 |
| 2014 | 2655 | 2114 | 541 | 1657 | 1503 | 154 | 998 | 611 | 387 | 62 |
| 2015 | 2478 | 1921 | 557 | 1518 | 1399 | 119 | 960 | 522 | 438 | 61 |
| 2016 | 2991 | 2416 | 575 | 2009 | 1885 | 124 | 982 | 531 | 451 | 67 |
| 2017 | 2839 | 2410 | 429 | 2150 | 2007 | 143 | 689 | 403 | 286 | 76 |

Table 5 Catch by species made on FOB-associated schools for the French purse seine fishing fleet of the Indian Ocean during 1981-2017

| Year | YFT | SKJ | BET | ALB | OTH | TOTAL |
|-------------|------------|------------|------------|------------|------------|--------------|
| 1981 | 37 | 128 | 20 | 0 | 56 | 240 |
| 1982 | 442 | 709 | 131 | 0 | 0 | 1282 |
| 1983 | 3959 | 6637 | 1381 | 0 | 136 | 12114 |
| 1984 | 10692 | 17600 | 3762 | 0 | 77 | 32130 |
| 1985 | 14623 | 26582 | 4993 | 14 | 167 | 46378 |
| 1986 | 15353 | 31040 | 4953 | 0 | 177 | 51522 |
| 1987 | 17926 | 30205 | 4937 | 0 | 3 | 53072 |
| 1988 | 12763 | 28633 | 4675 | 0 | 19 | 46090 |
| 1989 | 13769 | 26850 | 4499 | 0 | 0 | 45118 |
| 1990 | 10312 | 21046 | 3513 | 0 | 31 | 34902 |
| 1991 | 8886 | 36896 | 3858 | 0 | 0 | 49639 |
| 1992 | 13014 | 39286 | 3112 | 9 | 0 | 55421 |
| 1993 | 12111 | 40582 | 2769 | 5 | 0 | 55467 |
| 1994 | 13340 | 45866 | 4313 | 23 | 0 | 63543 |
| 1995 | 19002 | 39380 | 5933 | 17 | 0 | 64332 |
| 1996 | 16944 | 33741 | 5975 | 70 | 0 | 56730 |
| 1997 | 18173 | 26882 | 7389 | 67 | 0 | 52511 |
| 1998 | 12680 | 25599 | 5173 | 13 | 0 | 43464 |
| 1999 | 17389 | 31759 | 6692 | 103 | 0 | 55943 |
| 2000 | 17699 | 32142 | 4960 | 43 | 0 | 54845 |
| 2001 | 9678 | 29045 | 4206 | 108 | 15 | 43052 |
| 2002 | 13704 | 47527 | 6385 | 0 | 45 | 67661 |
| 2003 | 16810 | 33837 | 3429 | 0 | 31 | 54106 |
| 2004 | 13959 | 31473 | 4882 | 0 | 39 | 50352 |
| 2005 | 15399 | 31270 | 3667 | 0 | 0 | 50336 |
| 2006 | 14818 | 37920 | 4172 | 0 | 41 | 56951 |
| 2007 | 13254 | 26695 | 4662 | 3 | 0 | 44613 |
| 2008 | 12784 | 29427 | 4486 | 2 | 10 | 46710 |
| 2009 | 12320 | 33004 | 5125 | 10 | 0 | 50459 |
| 2010 | 15704 | 27461 | 3474 | 32 | 11 | 46682 |
| 2011 | 20755 | 26017 | 3555 | 45 | 0 | 50372 |
| 2012 | 15484 | 16442 | 2287 | 30 | 0 | 34243 |
| 2013 | 21008 | 20814 | 4506 | 32 | 0 | 46360 |
| 2014 | 15180 | 18540 | 2334 | 36 | 0 | 36090 |
| 2015 | 12216 | 17500 | 2105 | 44 | 0 | 31865 |
| 2016 | 17368 | 28420 | 3097 | 61 | 0 | 48948 |
| 2017 | 18282 | 31403 | 2910 | 54 | 13 | 52661 |

Table 6 Catch by species made on free-swimming schools for the French purse seine fishing fleet of the Indian Ocean during 1981-2017

| Year | YFT | SKJ | BET | ALB | OTH | TOTAL |
|-------------|------------|------------|------------|------------|------------|--------------|
| 1981 | 151 | 31 | 4 | 0 | 0 | 185 |
| 1982 | 638 | 83 | 14 | 0 | 0 | 736 |
| 1983 | 6441 | 1516 | 155 | 0 | 0 | 8111 |
| 1984 | 28576 | 4380 | 1319 | 224 | 25 | 34525 |
| 1985 | 23083 | 2601 | 1484 | 432 | 16 | 27615 |
| 1986 | 25558 | 7747 | 1683 | 200 | 0 | 35189 |
| 1987 | 23086 | 11415 | 1764 | 217 | 23 | 36505 |
| 1988 | 44003 | 9461 | 2575 | 177 | 0 | 56217 |
| 1989 | 19779 | 18900 | 1265 | 6 | 0 | 39951 |
| 1990 | 35039 | 6827 | 2150 | 36 | 0 | 44052 |
| 1991 | 29248 | 2492 | 1583 | 875 | 0 | 34198 |
| 1992 | 32268 | 5762 | 710 | 1394 | 0 | 40134 |
| 1993 | 27428 | 7611 | 2246 | 305 | 0 | 37590 |
| 1994 | 22479 | 12564 | 1054 | 269 | 0 | 36365 |
| 1995 | 20634 | 9272 | 1348 | 333 | 0 | 31587 |
| 1996 | 18633 | 6315 | 933 | 321 | 0 | 26203 |
| 1997 | 13054 | 4394 | 434 | 472 | 0 | 18355 |
| 1998 | 9702 | 4742 | 1215 | 448 | 0 | 16107 |
| 1999 | 13410 | 10907 | 1826 | 51 | 0 | 26193 |
| 2000 | 19995 | 7793 | 1713 | 307 | 0 | 29808 |
| 2001 | 24450 | 6627 | 1750 | 551 | 0 | 33377 |
| 2002 | 22111 | 6878 | 1578 | 264 | 0 | 30831 |
| 2003 | 46291 | 4422 | 2906 | 608 | 0 | 54226 |
| 2004 | 49215 | 5850 | 1916 | 77 | 0 | 57058 |
| 2005 | 41799 | 11950 | 2786 | 86 | 0 | 56620 |
| 2006 | 30564 | 11653 | 1542 | 850 | 0 | 44609 |
| 2007 | 23201 | 8224 | 2265 | 332 | 0 | 34023 |
| 2008 | 29401 | 4758 | 3166 | 979 | 0 | 38303 |
| 2009 | 15487 | 2527 | 1866 | 285 | 0 | 20166 |
| 2010 | 15242 | 1971 | 1529 | 31 | 0 | 18774 |
| 2011 | 13713 | 2809 | 2080 | 530 | 0 | 19132 |
| 2012 | 27668 | 678 | 2828 | 740 | 0 | 31913 |
| 2013 | 15503 | 1068 | 2509 | 299 | 0 | 19380 |
| 2014 | 18333 | 1404 | 2306 | 206 | 0 | 22249 |
| 2015 | 18830 | 897 | 2625 | 173 | 0 | 22525 |
| 2016 | 16388 | 2278 | 468 | 166 | 0 | 19301 |
| 2017 | 11680 | 828 | 1680 | 95 | 0 | 14284 |

Table 7 Number of sets per searching day on FOB-associated (FOB) and free-swimming schools (FSC) for the French purse seine fishing fleet of the Indian Ocean during 1981-2017

| Year | ALL | FOB | FSC |
|-------------|------------|------------|------------|
| 1981 | 0.77 | 0.20 | 0.57 |
| 1992 | 0.66 | 0.23 | 0.43 |
| 1993 | 0.81 | 0.30 | 0.52 |
| 1994 | 0.74 | 0.33 | 0.42 |
| 1995 | 0.84 | 0.38 | 0.47 |
| 1996 | 0.90 | 0.34 | 0.56 |
| 1997 | 0.68 | 0.21 | 0.47 |
| 1998 | 0.75 | 0.26 | 0.50 |
| 1999 | 0.80 | 0.21 | 0.59 |
| 2000 | 0.77 | 0.20 | 0.57 |
| 2001 | 0.70 | 0.18 | 0.52 |
| 2002 | 0.75 | 0.20 | 0.55 |
| 2003 | 1.00 | 0.25 | 0.75 |
| 2004 | 0.84 | 0.29 | 0.55 |
| 2005 | 0.82 | 0.23 | 0.59 |
| 2006 | 0.89 | 0.19 | 0.70 |
| 2007 | 0.71 | 0.15 | 0.57 |
| 2008 | 0.97 | 0.18 | 0.79 |
| 2009 | 0.94 | 0.27 | 0.68 |
| 2010 | 1.01 | 0.41 | 0.60 |
| 2011 | 1.05 | 0.35 | 0.69 |
| 2012 | 0.92 | 0.43 | 0.49 |
| 2013 | 1.05 | 0.43 | 0.62 |
| 2014 | 1.01 | 0.44 | 0.57 |
| 2015 | 0.99 | 0.47 | 0.52 |
| 2016 | 1.06 | 0.43 | 0.63 |
| 2017 | 1.01 | 0.45 | 0.56 |