

Original: English

FAD DATA: SUMMARY AND REVIEW OF THE FOB/FADs DEPLOYED BASED ON ST08-FADsDEP REPORTS (ICCAT DATABASE) BETWEEN 2011-2019*(ICCAT Secretariat)*

The ICCAT FADs database contains the information submitted annually by CPCs in the ST08-FADsDep since 2014. However, due to the changes in the FOB/FADs data requirements and the degree of spatial-temporal resolution of the information to be reported adopted by each of the recommendations on tropical tunas since 2016, the Secretariat had to modify the ST08-FADsDep e-form in 2017. These changes preclude the use of a unique database structure, and currently, the database contains data submitted before 2018 and after 2018 in separate tables. Nonetheless, the summary provided includes all data submitted until 2019 by CPCs.

As intended, the FAD Management Plan of the Commission aims primarily to monitor fishing activities of tropical tunas, **Table 1** presents a summary of the reported catches of SKJ, BET, and YFT by the purse seine and baitboat fisheries that are likely associated with FOB/FADs fisheries in the 2010-2019 period. **Table 2** presents the reporting CPCs that have submitted FOB/FAD information by year using the ST08 forms. However, it is noted that some of the ST08 data submitted indicated no FOB/FADs deployment, nor fishing activity using FADs by their national fisheries, these are indicated in **Table 3** by the zero red values in each case.

The annual number of deployed FOB/FADs is presented in **Table 4**. Since 2016 it was requested that information be provided on a monthly basis, **Table 5** shows the number of FOB/FADs deployed by month and year. Based on the type of material and source of the FOB/FADs, **Table 6** presents a summary of the available information on the type of FOB deployed by year and flag. Currently, most FOB/FADs deployed have a beacon associated that allows vessels to monitor or find it, **Table 7** shows the type of beacons reported by year and flag, most of this information is only available since 2015. In 2017 it was approved a major modification of the ST08 e-form, to accommodate new requirements for better implementation of the FAD Management Plan of the Commission. Since 2018 CPCs have provided information on the vessels associated with the deployment, service, and use of FOB/FADs by each fleet, **Table 8** shows the number of different vessels reported by each flag. The requirements also provide the spatial and monthly deployment of FOB/FADs, data on location is available since 2016. **Figure 1** shows the 1x1 lat-lon grids where at least one FOB/FAD was deployed by each flag in the years 2018/19. **Figures 2** and **3** present the density of deployments for the last four years (2016/19). From the 2016/17 data also available is the number of beacons followed by the flag/fleet vessels by month and lat-lon grid (**Figure 4**). Finally, **Figure 5** shows the log-based (*e*) of the total number of lost FOB/FADs by 1x1 lat-lon grid for 2018/19 as reported by the CPCs.

Following the PA1 request during the intersessional meeting, the following new tables are provided regarding tropical tunas FAD fisheries: **Table 9** presents a summary by year (2010-2019) and Flag of the reported FAD catches tropical tunas (SKJ, BET, YFT) based on Task 2 catch and effort data and the corresponding number of FOB/FADs deployed by year and flag through ST08-FADsDep form. **Table 10** shows the summary of catch and fishing effort for tropical tunas FAD fisheries by year and flag, disclosing the type of unit of fishing effort reported in each case. Highlighted cells show those reports with unit of effort as number of sets on FADs available, noting that some CPCs only report the number of positive sets (e.g. catch > 0).

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Table 1. Nominal catches reported by flag for catches of tropical tunas (SKJ, YFT, BET) by the purse seine and baitboat fisheries that can be associated with FOB fisheries in the 2010-2019 period.

Species	BET YFT SKJ	YearC									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Sum of Qty_t											
Flag	SpcGearGrp										
Angola	Purse seine	137	7	18							3,643
Argentina	Purse seine	12									
Belize	Purse seine	5,176	11,654	22,866	13,423	19,512	21,377	14,804	17,115	30,651	28,190
Brazil	Bait boat	23,351	30,740	31,480	33,290	25,064	17,992	16,864	14,944	15,363	16,029
	Purse seine		559	10							
Cape Verde	Bait boat			77	77	77	77				
	Purse seine	11,433	14,612	9,883	23,936	22,259	26,743	16,036	8,573	12,220	8,164
Côte d'Ivoire	Purse seine		2,482	8,317	4,524	2,870					
Curaçao	Purse seine	17,738	20,369	23,180	24,123	26,025	28,501	33,890	30,289	35,841	27,955
El Salvador	Purse seine						10,828	27,067	22,856	25,280	23,169
EU-España	Bait boat	12,785	19,190	23,331	13,167	14,457	11,845	16,222	16,787	16,772	15,280
	Purse seine	66,277	73,111	73,568	75,779	63,066	64,246	66,617	64,236	54,887	56,628
EU-France	Bait boat	1,420	1,778	1,815	736	1,146	1,330	1,837	1,686	1,274	1,695
	Purse seine	37,969	39,003	35,750	39,665	41,492	42,023	48,164	44,956	50,718	41,838
EU-Italy	Purse seine									0	2
EU-Portugal	Bait boat	15,757	10,580	8,763	9,461	5,476	4,313	2,381	4,458	10,890	5,477
	Purse seine	14	14	11	1		1	1	8	1	43
Ghana	Bait boat	20,916	23,294	22,867	16,250	16,962	19,341	20,518	15,424	17,489	13,130
	Purse seine	51,094	42,916	52,335	48,764	56,298	68,349	59,777	66,719	79,873	79,704
Guatemala	Purse seine	7,273	5,979	6,966	9,183	10,684	12,619	11,220	15,207	12,727	12,250
Guinea Ecuatorial	Purse seine	2,116	1,267								
Guinée Rep	Purse seine	2,908	4,458	14,560	12,678	10,024					
Korea Rep	Purse seine	1									
Maroc	Purse seine	892	1,070	1,084	1,142	600	103	55	177	1,111	447
Mixed flags (EU tropical)	Purse seine	4,608	4,230				13,804	15,662	13,323	14,263	1,069
Namibia	Bait boat	50	310	181	100	54	95	123	92	95	38
Panama	Purse seine	18,131	21,109	18,004	22,435	21,552	13,234	17,929	15,465	14,825	19,373
S Tomé e Príncipe	Purse seine	480	520	534	548	562	1,294	1,103	1,004	19	18
Senegal	Bait boat	4,556	7,037	6,685	6,141	3,942	2,979	3,763	3,268	1,534	2,420
	Purse seine						4,364	21,005	28,223	34,145	37,914
South Africa	Bait boat	168	586	180	513	1,405	836	611	257	258	471
Syria	Purse seine			7	8						
UK-Sta Helena	Bait boat	101	724	230	79	188	228	386	300	251	342
Venezuela	Bait boat	990	1,228	914	739	440	467	1,177	583	386	300
	Purse seine	4,702	3,785	4,951	4,613	3,784	3,982	4,391	5,793	2,899	1,648
Grand Total		311,055	342,613	368,567	361,376	347,939	370,969	401,600	391,744	433,772	397,239

Table 2. Table of the reporting Flags that submitted ST08 form "Fishing Aggregating Devices (FADs) Deployed in the Year" 2011-2019 ICCAT dBase.

FlagName	Year									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Belize						1	1			7
Bolivia								1		1
Cape Verde										1
Curaçao			1	1	1	1	1	1	1	2
El Salvador						1	1	1	1	1
EU.España					1			1		1
EU.France	1	1	1	1		1	1	1	1	1
FR.St Pierre et Miquelon										1
Ghana				1		1	1			1
Guatemala								1		
Mexico										1
Panama			1	1	1			1		
Sta. Lucia			1							
UK.Bermuda										1
UK.British Virgin Islands										1
UK.Sta Helena							1			1
UK.Turks and Caicos										1
Grand Total	1	1	4	4	3	5	6	7		21

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Table 3. Table of the number of records reported by Flags in the ST08 form 2011-2019 ICCAT dBase. Zero values indicate NO report of FAD deployments or non-fishing activity on FOB/FADs.

Sum of NumRecords	Column Labels								
Row Labels	2011	2012	2013	2014	2015	2016	2017	2018	2019
Belize						508	36000		1116
Bolivia								0	0
Cape Verde									111
Curaçao			4	4	8	34528	29915	20119	38161
El Salvador						16031	14043	15568	16851
EU.España					25			23796	25161
EU.France	6	53	15634	16		19188	18987	4138	16856
FR.St Pierre et Miquelon									0
Ghana				4		11445	12		12
Guatemala								13915	
Mexico									0
Panama			4	4	8			13923	
Sta. Lucia			13774						
UK.Bermuda									0
UK.British Virgin Islands									0
UK.Sta Helena							8		0
UK.Turks and Caicos									0
Grand Total	6	53	29416	28	41	81700	98965	91459	98268

Table 4. Number of FOBs deployed by year and Flag for submitted ST08 FAD e-forms ICCAT dBase 2011-2019.

FlagCode	2011	2012	2013	2014	2015	2016	2017	2018	2019
BLZ				1,013	466	1,291	141		4,539
CPV									110
CUW			1,696	1,693	1,379	22	25	1,958	2,485
EU.ESP			19,933	19,584	18,627			7,622	7,782
EU.FRA	2,869	3,320	3,293	1,273	1,287	668	5,672	2,486	2,139
GHA				9,100		17,600	24,825		
GTM							25	2,658	
LCA			6	10					
PAN			314	288	1,525	27		2,287	
SLV						22	22	868	980
UK.SHN					-		8		
Grand Total	2,869	3,320	25,242	32,961	23,284	19,630	30,718	17,879	18,035

Table 5. Number of FOBs deployed by year and month for submitted ST08 FAD e-form ICCAT dBase 2016-2019. The monthly reporting requirement starts in 2016.

Month	2016	2017	2018	2019
Jan	139	441	1,348	1,072
Feb	127	897	783	528
Mar	141	2,171	2,016	1,548
Apr	170	3,382	1,615	1,960
May	1,724	2,336	1,483	1,720
Jun	3,662	4,259	1,252	1,380
Jul	2,130	2,535	1,343	1,731
Aug	3,163	3,651	1,713	2,436
Sep	2,283	2,909	1,631	1,388
Oct	2,150	2,972	1,769	1,494
Nov	2,206	2,888	1,455	1,844
Dec	1,734	2,270	1,471	934
Total	19,630	30,710	17,879	18,035

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Table 6. Number of deployed FOB/FADs by type of aggregating device and year.

Year	Anchored FAD		Drifting Artificial FAD	Artificial log Human Fishing Activity	Artificial log Human Other Activity	Natural log Animal	Natural log Plant	Mixed	Unknown
	AFAD	DFAD	DFAD	FALOG	HALOG	ANLOG	VNLOG	VNLOG-DFAD	UNK
2011									2,869
2012									3,320
2013	6	21,943							3,293
2014	10	30,747					26		2,178
2015	-	20,605					52		2,627
2016		19,626					4		
2017	8	30,710							
2018		17,864		1	1		13		
2019		17,938		20	1		76		
Total	24	159,432		21	2	-	171	9,482	4,805

Table 7. Number of deployed FOB/FADs by type of beacon instrumentation used by year.

Year	Radio direction finder	Radio direction finder and GPS	GPS	Sonar	Sonar with echo-sounder	Satellite and echo-sounder	Satellite without echo-sounder	FAD without Bouy signal	Unknown
	RDF	RDFGPS	GPS	SON	SONES	SATES	SAT	NoBouy	UNK
2011									2,869
2012									3,320
2013									25,242
2014									32,961
2015						22,428	772		84
2016		17,600				1,991	39		
2017		24,825	12			4,327	9		1,545
2018						17,857	3	-	19
2019					876	17,131	-	6	22
Total	-	42,425	12	-	876	63,733	823	6	66,062

Table 8. Number of different vessel IDs reported by Flag for 2018-2019.

Flag	2018	2019
BLZ	-	10
CPV	-	1
CUW	6	6
EU_ESP	11	14
EU_FRA	11	10
GTM	5	-
PAN	4	-
SLV	4	4
Total	41	45

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Table 9. Summary of the total catch (t) by flag and year from purse seine (PS) fisheries on FOB/FADs (Task 2 CE) and the corresponding total number of FOB/FADs deployed as reported in ST08-FADsDep form (yellow background lines).

		Task 2 CE Trop Tunas									
GearCode	PS										
Catch t per year / flag of PS on FAD											
Number of FOBs deployed by year and Flag											
FishMode	Flag	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
FAD	Belize	2,310	2,117	-	3,067	6,114	4,565	7,071	7,266	-	-
						1,013	466	1,291	141	-	4,539
	Cape Verde	7,140	10,202	6,333	9,866	22,122	21,946	13,255	7,392	7,680	5,728
											110
	Côte d'Ivoire	-	-	-	-	2,705	-	-	-	-	-
	Curaçao	14,830	17,574	17,564	19,292	22,340	24,332	29,154	25,648	25,889	20,218
					1,696	1,693	1,379	22	25	1,958	2,485
	El Salvador						7,865	23,556	17,451	20,065	20,771
								22	22	868	980
	EU-España	42,893	56,905	56,534	63,033	52,545	48,642	52,831	59,572	41,980	43,963
					19,933	19,584	18,627	-	-	7,622	7,782
	EU-France	15,932	13,305	16,677	16,989	20,998	23,222	21,905	21,702	24,307	23,391
			2,869	3,320	3,293	1,273	1,287	2,849	5,672	2,486	2,139
	Ghana	29,553	24,608	47,896	44,900	52,044	66,641	58,760	66,529	79,709	79,316
						9,100	-	17,600	24,825	-	-
	Guatemala	3,911	3,198	4,871	5,447	6,296	10,463	8,393	11,417	10,580	9,341
									25	2,658	-
	Guinée Rep	-	-	12,883	9,415	6,680	-	-	-	-	-
	NEI (ETRO)	348	-	-	-	-	-	-	-	-	-
	Panama	13,927	19,212	13,215	18,051	18,783	11,257	16,258	11,854	9,541	-
					314	288	1,525	27	-	2,287	-
	Senegal	-	-	-	-	-	4,568	19,830	27,616	30,131	36,899
TOTAL Catch t		130,844	147,121	175,973	190,061	210,628	223,500	251,012	256,449	249,880	239,628
Total Number FOBs deployed		-	2,869	3,320	25,236	32,951	23,284	21,811	30,710	17,879	18,035

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Table 10. Summary of catch and fishing effort for tropical tunas FAD fisheries by year and flag, disclosing the type of unit of fishing effort reported in each case (Task 2 CE), values represent total catch (kg). Highlighted cells show those reports for number of sets on FADs, noting that some CPCs only report number of positive sets (e.g. catch > 0).

Time Period	2000 - 2020																				
GearCode	Purse Seine																				
Total catch (kg)																					
Flag	FleetCode	Eff1Type	Eff2Type	Eff3Type	Eff4Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Belize	BLZ-BZ-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD					1,928,770	4,215,960	3,604,730		8,312,790	9,364,920	7,512,270	9,138,790	11,538,830			
Cape Verde	CPV-CV-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD	13,180,960	14,555,310	9,703,990		7,890,840	10,347,550	13,201,590	8,578,180	13,626,300	24,976,250	27,109,820	16,491,280	8,783,800	12,437,740	8,337,980	
Côte d'Ivoire	CIV-CI-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD										2,707,040						
		NO.SETS	D.AT SEA											3,742,500							
Curaçao	CUW-CW-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD		5,547,150	2,957,690	15,992,930	18,169,490	18,112,950	20,031,570	22,723,860	23,964,580	27,435,300	29,652,820	35,028,060	31,874,590	37,267,910	28,707,910	
El Salvador	SLV-SV-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD											8,384,030	26,098,520	23,750,920	26,482,770	24,240,130	26,166,580
EU-España	EU.ESP-ES-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD	32,143,460	28,334,560	33,250,540	55,889,850	68,801,840	65,339,250	74,052,170	74,053,620	75,770,230	62,211,240	66,296,460	69,545,820	66,073,570	56,056,710	57,834,940	
EU-France	EU.FRA-FR-ETRO	FISH.HOUR	NO.SETS			37,117,219	26,534,292	18,537,040	20,629,172	27,273,967	37,364,976	36,989,736	33,999,168	39,345,401	43,053,513	43,027,248	48,678,471	45,730,078	51,214,293	42,477,208	
Ghana	GHA-GH-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD					2,623,030											
	GHA-GH-ETRO-A	FISH.HOUR	HOURS.SEA																		
		NO.SETS	SUC.SETS	D.FISH	HOURS.SEA	1,309,000	13,345,500	4,042,000	17,215,000	31,882,000	32,332,500	25,147,500	26,069,500	17,817,000	16,537,000	20,653,500	19,658,000	17,533,500	27,650,000	37,366,400	38,489,000
	GHA-GH-ETRO-P	FISH.HOUR	HOURS.SEA			26,257,548		10,431,569													
		NO.SETS	SUC.SETS	D.FISH	HOURS.SEA		659,000		505,000	5,444,000	935,000	1,761,000	26,265,500	30,947,000	39,761,000	47,695,500	40,118,500	49,185,500	52,223,000	42,338,000	38,452,500
Guatemala	GTM-GT-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD	10,293,490	11,212,770	9,941,060	11,127,670	7,632,380	6,716,030	5,574,090	7,642,460	8,706,560	9,961,000	12,164,690	11,414,440	15,286,380	13,083,680	12,587,100	
Guinée Rep	GIN-GN-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD								12,882,500	9,415,240	7,444,400						
Maroc	MAR-MA-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD	4,969,490	421,890														
NEI (ETRO)	NEI.001	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD						387,980										
	NEI.001-SC	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD																
Panama	PAN-PA-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD		25,410,320	32,473,160	17,102,750	17,174,710	17,358,970	20,668,190	18,099,690	21,737,680	22,641,240	13,634,370	19,286,420	17,049,690	15,533,240		
						20,962,130															
Senegal	SEN-SN-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD											5,465,010	21,888,390	28,701,750	34,569,130	39,692,000	32,974,830
St Vincent and Grenadines	VCT-VC-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD																
Venezuela	VEN-VE-ETRO	FISH.HOUR	HOURS.SEA	Hours.STD	Hours.FAD																

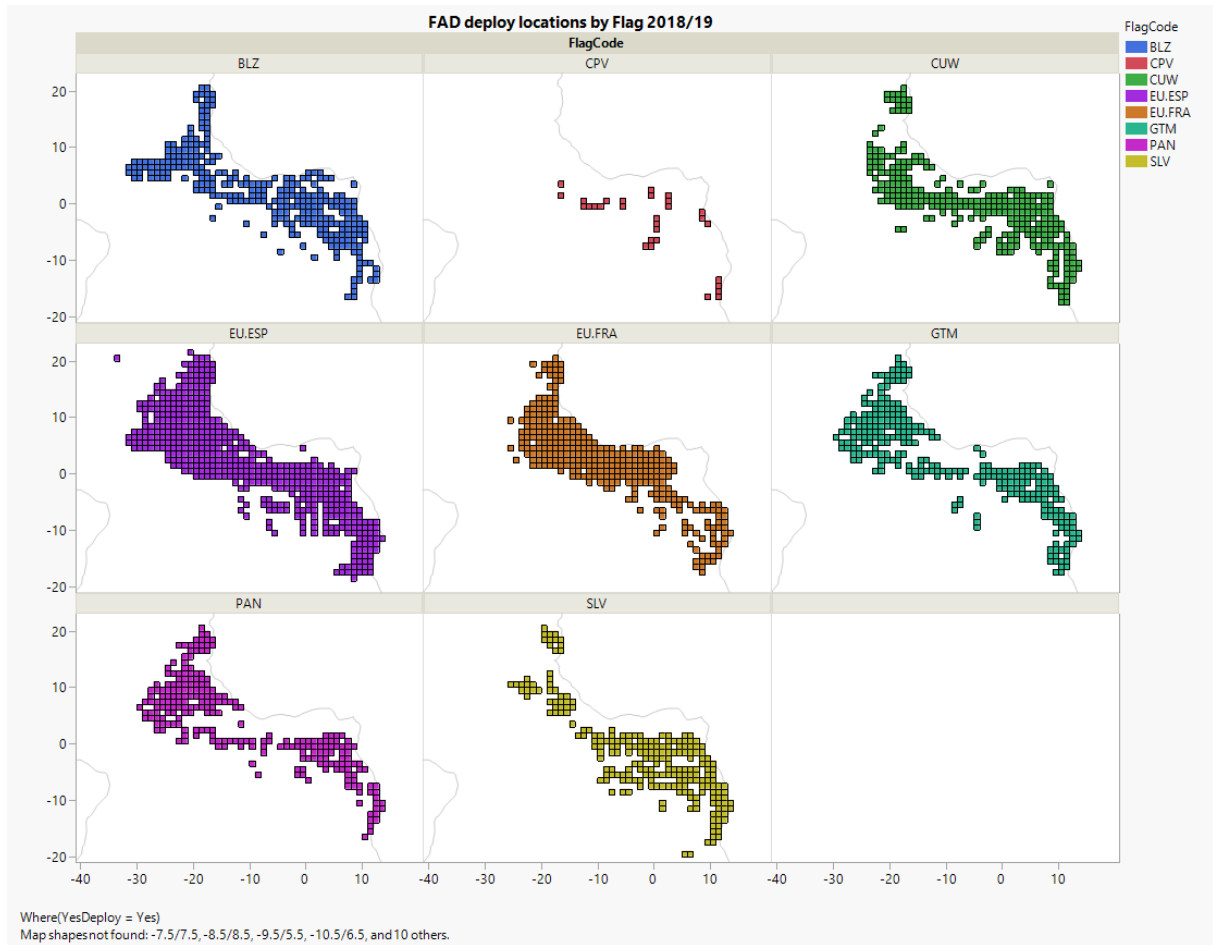


Figure 1. Summary 1x1 lat-lon for the deployment of FOB/FADs as reported by Flag during 2018-19. Grid cells show the location where at least one FOB/FAD was deployed.

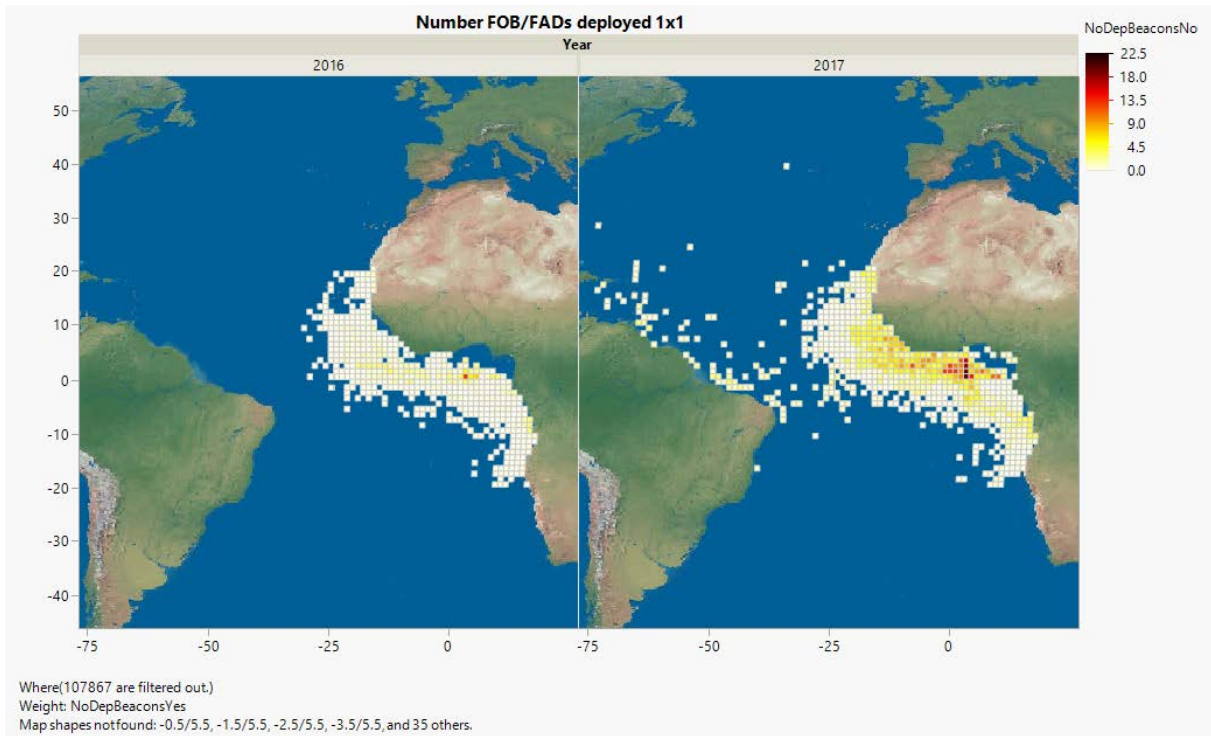


Figure 2. Deployed FOB/FADs by 1x1 lat-lon for 2016-2017. Shade colors are proportional to the total number of deploys by cell-year.

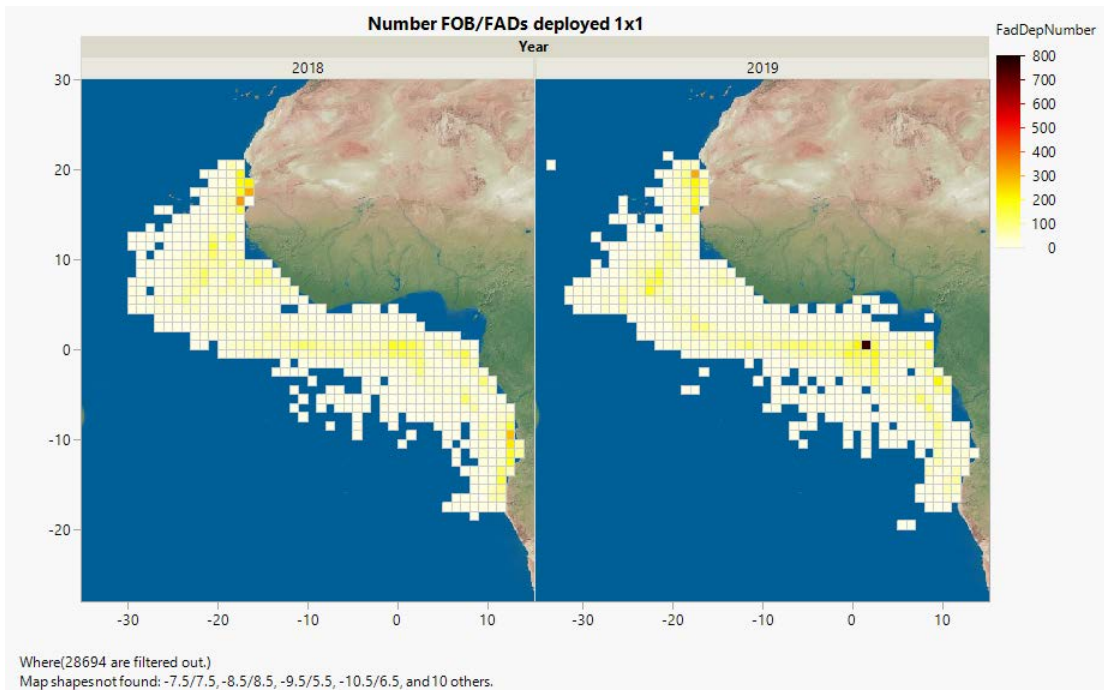


Figure 3. Density of deployed FOB/FADs by 1x1 lat-lon grid. Shade colors are proportional to the total number of deployments per year.

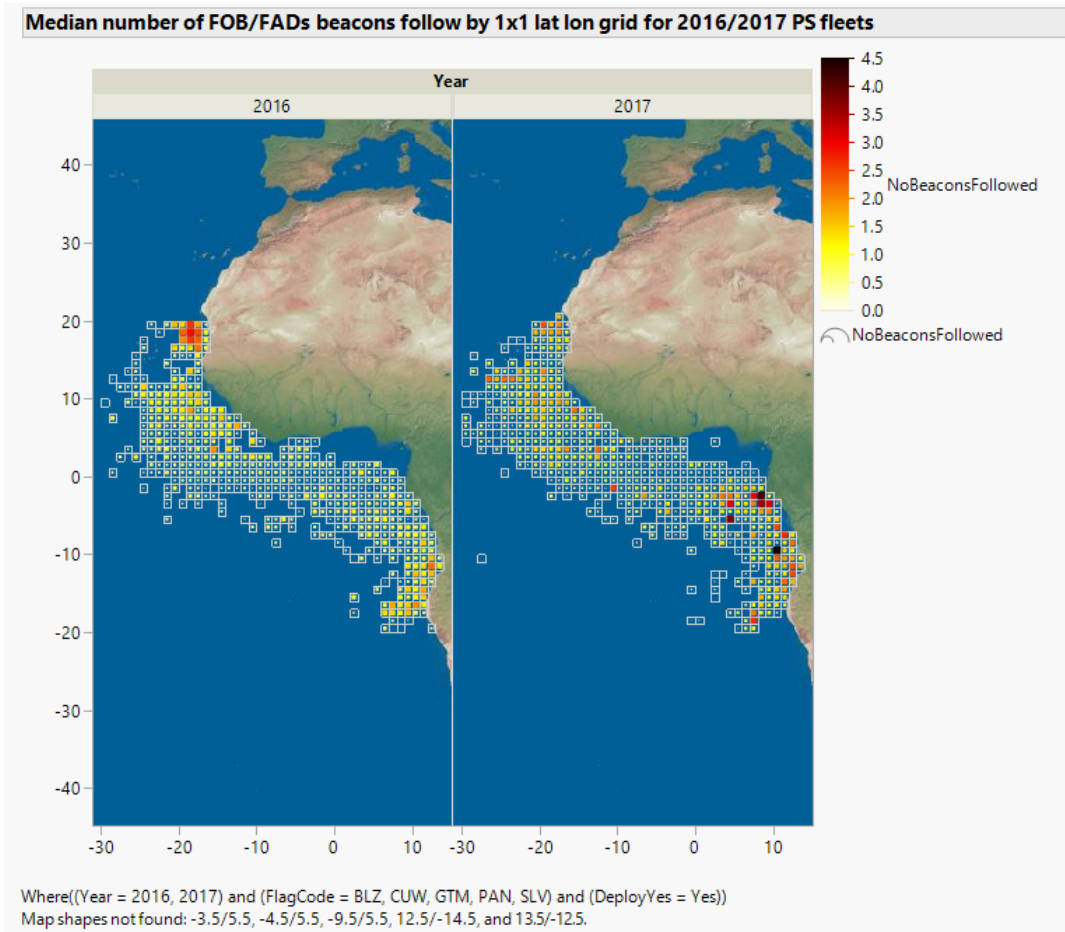


Figure 4. Median annual number of FOB/FADs beacons monitored by 1x1 lat-lon grid for PS fleets.

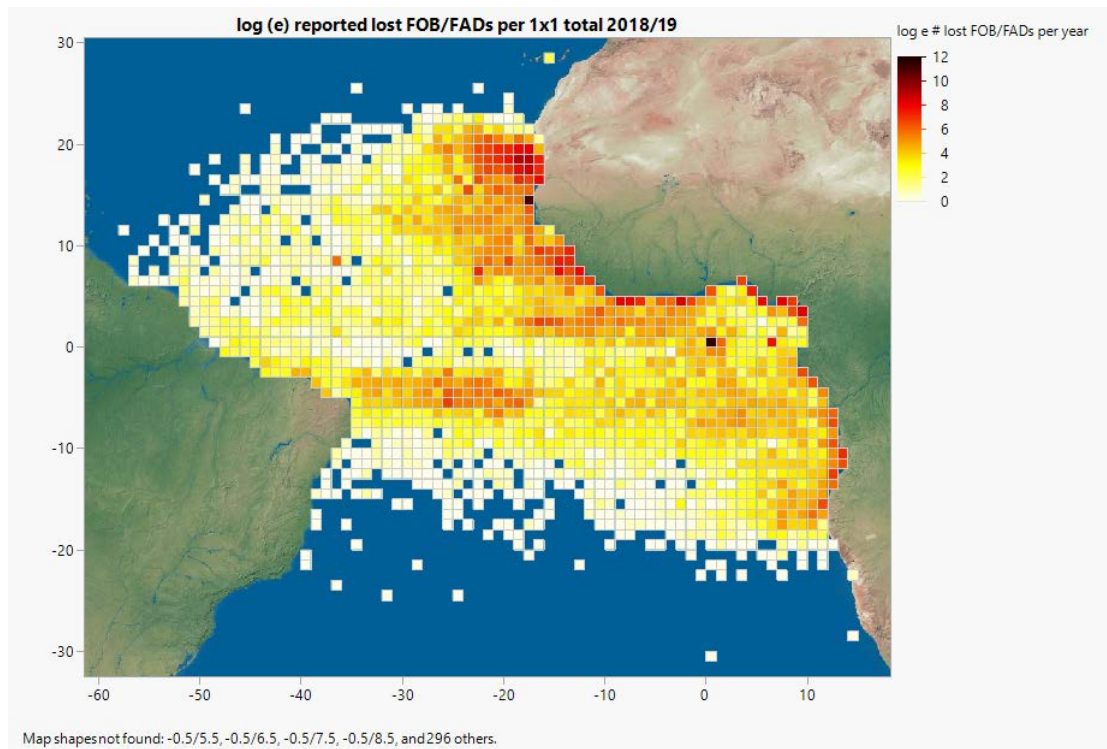


Figure 5. Reported 1x1 lat-lon grid mean number of lost FOB/FADs by year.