

## 7<sup>th</sup> MEETING OF THE SCIENTIFIC COMMITTEE

*La Havana, Cuba, 7 to 12 October 2019*

### SC7-SQ01

#### Squid information held by the Secretariat

*Secretariat*

#### 1. Introduction

This paper identifies and describes Jumbo flying squid datasets held by the SPRFMO Secretariat. It also shows a comparison between the data in the datasets held by the Secretariat and the data in the FAO data series. It is an updated to the paper [SC6-SQ01](#), Jumbo flying squid datasets held by the Secretariat, presented to the 6<sup>th</sup> Scientific Committee meeting in 2018.

The Jumbo flying squid fishery is a large fishery that covers an extensive area of the Eastern Pacific Ocean. During 2018 there were 363 Chinese vessels, 17 Korean vessels and 14 Chinese Taipei squid jigging vessels operating in the SPRFMO Area as well as numerous vessels (mainly artisanal) operating in the nearby EEZs and Territorial waters.

#### 2. Recommendations from SC6

Based on the discussion of SC6-SQ01 (Jumbo flying squid datasets held by the Secretariat), SC6:

- **Agreed** that 1990 is a suitable start year for historic squid data. Prior to this period the catches were smaller (with a noted exception for 1985).

- **Recommended** that direct correspondence with Japan be done to more accurately represent their data:

*On 17 July 2019 the Secretariat contacted the Resources Management Department of the Fisheries Agency of Japan and arising from this contact two scientists from Japan's [National Research Institute of Far Seas Fisheries](#) are attending SC7.*

- **Noted** that for all models introduced, fishery (catch and effort) and biological data size frequency, weight and maturity) at a suitable intra-annual time scale is needed.

- **Requests** that relevant members make recommendations regarding their historic catch data.

- **Recommended** that the Secretariat work with members to evaluate the potential for double counting of catch (e.g., catch reported by flag and also within EEZs):

*Peru have updated their historic catch in the period 1991-1995 to remove double counted catches taken by foreign flagged vessels.*



### 3. Fishing Activity data

The Secretariat holds fishing effort data at varying resolutions as shown in Table 1. Since 2016 Fishing Activity data has been provided at the daily 0.1×0.1 degree resolution.

**Table 1: Resolution of fishing activity data held by the Secretariat (SPRFMO Area).**

Participant	Years	Datatype
China	2002-2006	5×5 degree (Jig - Annual)
	2008, 2015	1×1 degree (Jig - Monthly)
	2016-2018	0.1×0.1 degree (Jig - Daily)
Japan	2010	0.1×0.1 degree (Jig - by Trip)
Korea	2012-2018	0.1×0.1 degree (Jig – Daily)
Peru	2014, 2017 (research)	0.1×0.1 degree (Trawl -Tow by Tow)
Chinese Taipei	2007-2015	5×5 degree (Jig - Annual)
	2016-2018	0.1×0.1 degree (Jig - Daily)

### 4. Annual Catch Data

The annual catch data for Jumbo flying squid beginning in 1990 is shown in Table 2. Updated figures are indicated by an underline. As noted above, in 2018 Peru provided an update for its Annual Catch figures for the period 1991 to 1995.

Catch data from research surveys by a Peruvian research vessel in the SPRFMO zone in 2015, 2016 and 2017 have been included. Also, catches from Panama in 2016 and 2017 have been included in this paper for the first time.

Catches from 2017 have been updated based on Annual Catches (rather than the estimates presented in SC6-SQ01). Catches from 2018 (when present) have been estimated based on Fishing Activity data submitted by 30 June 2019.



Table 2: Annual Catch weights (t) for Jumbo flying squid (GIS) as submitted to the SPRFMO Secretariat (post 1990).

Year <sup>1</sup>	Chile		China	Ecuador	EU	Japan			Korea			Chinese Taipei		Peru		Panama	Ukraine	Total	
	EEZ-CHL	FAO 87	HS-FAO 87	HS-FAO87	FAO 87	HS-FAO 87	EEZ-Other	FAO 87	HS-FAO 87	EEZ-PER	HS-FAO 87	FAO 87	FAO 87	HS-FAO 87	EEZ-PER	HS-FAO 87	HS-FAO 87	FAO 87	
1990							0	1 605				3 465			7 441			142	12 653
1991		445					2 173	50				24 015			<u>20 657</u>			398	<u>47 738</u>
1992		9 400			???		49 313	1 874				43 022	1 698		<u>12 695</u>			1	<u>118 002</u>
1993		7 442			???		52 221	3 579				62 887	0		<u>7 769</u>				<u>133 897</u>
1994		205					81 507	2 698				69 664	0		<u>42 838</u>				<u>196 912</u>
1995					???		36 478	37				35 719	0		<u>25 676</u>				<u>97 909</u>
1996		2					557	644				12 896	0		8 138				22 237
1997							12 924	297				3 359	0		16 061				32 641
1998		5					0	0	0				0		547				552
1999		6					6	40				19 728	0		54 652				74 431
2000		9					32 174	1 704				20 822	0		53 795				108 504
2001		3 476		17 770			71 069	1 132	5 797	0			0		71 834				171 078
2002		5 589		50 483			26 268	33 978	13 130	8 629				12 064	146 390				296 531
2003		15 191		81 000			22 549	4 510	1 681	3 041				23 009	153 727				304 708
2004		175 134		205 600			22 385	4 615	2 026	8 761				39 450	270 368				728 338
2005		296 953		86 000				1 633	2 519	0				15 976	291 140				694 221
2006		219 800		62 000				323	2 048	437				18 349	434 261				737 217
2007	124 389			46 400					0	0			14 750		427 591				613 130
2008	145 171			79 064					5 971	804			31 161		533 414				795 585
2009	56 337			70 000					7 221	0			12 319		411 805				557 681
2010	200 428			142 000					498	7 764	6 742		29 206		369 822				756 460
2011	163 450		45	250 000								7 410		35 418	404 730				861 053
2012	144 956		9	261 000								8 310		14 177	497 462				925 914
2013	105 905		22	264 000			???					6 034		7 759	451 061				834 780
2014	176 569		0	332 523			???					7 203		4 795	556 156	1 190			1 078 435
2015	143 716		0	323 636	1 500							4 263		10 072	513 796	<u>1.6</u>			<u>996 983</u>
2016	183 123		0	223 300		0.1						4 388		12 989	<u>323 337</u>	<u>0.3</u>		<u>842</u>	<u>747 979</u>
2017	<u>155 389</u>			<u>296 100</u>								<u>3 460</u>		7 338	<u>295 620</u>	<u>1.0</u>		<u>289</u>	<u>758 197</u>
2018 (est.)				<u>270 624</u>								<u>3 651</u>		<u>3 674</u>					

2018 figures are estimates from fishing activity data where available. Updated figures have been underlined.

Ecuador provided some information in paper [SC-03-35](#) during 2015, but complete annual figures have not yet been supplied.

<sup>1</sup> SC6 in 2018 agreed that 1990 is a suitable start year for historic squid data. The Secretariat holds data back to 1978.



## 5. Comparison with Annual Catch figures held by FAO

Table 3 compares the SPRFMO catch data series with an FAO extracted series and highlights observed differences. This table differs slightly from the table presented to SC6, mainly due to the updated Peru figures from 1991 to 1995 which now align with FAO figures.

**Table 3: Comparison of Annual Catch figures (t) for Jumbo flying squid (GIS) submitted to the SPRFMO Secretariat with FAO figures for FAO Area 87. Green figures indicate that the SPRFMO figures are larger**

	Chile	China	Ecuador	Japan	Korea	Panama	Peru	Chinese Taipei	Ukraine	FAO	SPRFMO	Difference
Year	FAO87	FAO87	FAO87	FAO87	FAO87	FAO87	FAO87	FAO87	FAO87	Total	Total	%
1990	0	0	0	257	2 991	0	0	0	0	9 405	12 653	25.7
1991	0	0	0	0	6 981	0	0	0	18	40 739	47 738	14.7
1992	0	0	0	0	6 921	0	0	0	0	111 082	118 003	5.9
1993	0	0	0	0	5 109	0	0	0	0	128 789	133 898	3.8
1994	0	0	0	0	3 278	0	0	0	0	193 634	196 912	1.7
1995	0	0	0	0	1 279	0	0	0	0	96 631	97 910	1.3
1996	0	0	0	0	1 112	0	0	0	0	21 125	22 237	5
1997	0	0	0	0	975	0	0	0	0	31 666	32 641	3
1998	0	0	0	0	-201	0	0	0	0	753	552	-36.4
1999	0	0	0	0	915	0	0	0	0	73 517	74 432	1.2
2000	0	0	0	-24 459	5 197	0	0	0	0	127 766	108 504	-17.8
2001	0	0	0	555	0	0	0	0	0	170 523	171 078	0.3
2002	0	0	0	0	0	0	0	0	0	296 531	296 531	0
2003	0	0	0	1	0	0	0	0	0	304 707	304 708	0
2004	0	0	0	-19 187	0	0	0	0	0	747 526	728 339	-2.6
2005	-1	0	0	-32 019	0	0	0	0	0	726 241	694 221	-4.6
2006	-31 189	0	-212	-37 105	0	0	0	0	0	805 724	737 218	-9.3
2007	0	0	-121	-14 059	0	0	0	0	0	627 310	613 130	-2.3
2008	-496	0	-668	-14 143	0	0	0	0	0	810 892	795 585	-1.9
2009	0	0	0	-27 271	0	0	0	0	0	584 953	557 682	-4.9
2010	0	0	0	-16 615	0	0	0	0	0	773 075	756 460	-2.2
2011	0	0	0	-9 977	-433	0	0	0	0	871 463	861 053	-1.2
2012	0	0	-91	-1 448	0	0	0	0	0	927 453	925 914	-0.2
2013	-344	0	-2	0	-1 033	0	0	0	0	836 160	834 781	-0.2
2014	-33	0	-18 146	0	0	0	-55 098	0	0	1 151 713	1 078 436	-6.8
2015	32	0	221	0	0	0	-4 176	0	0	1 000 908	996 985	-0.4
2016	2 209	0	-485	0	0	842	0	0	0	745 413	747 979	0.3
2017	2 852	0	-4 853	0	4	289	-354	0	0	760 259	758 197	-0.3

Based on Tables 1 and 3, in order to complete the reconstruction of the historic catches for squid the Secretariat encourages the SC to:

- Request that the remaining relevant Members make recommendations regarding their historic catch data especially for situations where the High seas/EEZ separations are unclear and where FAO/SPRFMO comparisons show sizable differences. Thus, the following actions are suggested:
  - Chile to advise (if possible) the explicit area(s) that the 1991-2006 catches were taken and to verify that the 2006 SPRFMO held figure is accurate;
  - Ecuador to submit a complete Jumbo flying squid catch history;
  - Korea to advise (if possible) the explicit area(s) that the 1990-2000 catches were taken;
  - Chinese Taipei to advise (if possible) the explicit area(s) that the 2007-2010 catches were taken;
  - Peru to verify that the 2014 SPRFMO held figure is accurate.
- Request that Japan advises which figures are the most accurate to use for the period 2000-2012.
- Agree that this series represents the best available catch history for Jumbo flying squid in the SPRFMO and neighbouring EEZ areas.