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SOUTH PACIFIC ALBACORE FISHERY

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Paper prepared by the Secretariat

Introduction

This paper was first prepared by the Secretariat for WCPFC8 in March 2012 following a request by Te Vaka Moana at TCC7.

TCC7 Summary Report Para 20: Several CCMs associated with the Te Vaka Moana (TVM) group expressed concern about the expansion of the South Pacific ALB fishery which is vital to the economic development of some members. These CCMs highlighted limits contained in CMM 2009-03 on the number of vessels fishing for albacore south of 20 degrees and noted that as of 2011 CCMs are required to report target and bycatch catch figures for this fishery. These CCMs considered that further strengthening of the CMM may be required. The Secretariat was requested to prepare a paper for WCPFC8 containing all available catch and transshipment data by flag and by zone for South Pacific ALB and highlighting trends since the year 2000 in this fishery.

In September 2012, TCC8 recommended sufficient priority be accorded to the development of a revised CMM on south Pacific albacore at WCPFC9, and FFA members requested that this paper be updated.

TCC8 Draft Summary Report Para 379: FFA members requested that SPC update its analysis which was presented to WCPFC8, for WCPFC9 and then annually for TCC and Commission meetings. Ideally, this paper would include finer scale spatial and temporal information and the inclusion of additional fleets such as the troll fishery.

Update

The text and descriptions of SPA fishery trends that follows, are largely unchanged since the previous paper (WCPFC8-2011-IP/04 Rev 1, 21March 2012). However, currently available

longline catch estimate data for SPA has been used to update tables and figures, and is reflected within the text.

Estimated catch of SPA by troll fisheries from 2000 to 2011 is now also included.

Transshipment data are much improved and cover the period from the inception of transshipment reporting (July 2010) to date, noting however that transshipment is not fully reported for the most recent months.

Data Presented

All data are for the WCPFC Convention Area south of the equator. The breakdown of annual catch estimates by EEZ/High seas requires operational data, or the provision of annual catch and effort estimates by EEZ/high seas areas, neither of which have been provided for several key fleets. As a consequence, these estimates should be considered as very provisional until such time as complete operational data and/or annual catch estimates by EEZ have been provided for ALL fleets.

Tables 1 and 2 detail longline catch estimates of SPA from 2000 to 2011 by EEZ/High Seas and by flag respectively (data provided by SPC-OFP).

Table 3 details longline catch estimates by EEZ/High Seas and flag combined from 2000 to 2011 (data provided by SPC-OFP).

Tables 4a and 4b detail estimated troll catches of SPA from 2000 to 2011 by EEZ/High Seas and by flag respectively (data provided by SPC-OFP).

Table 5 presents notification of high seas transshipments by month from July 2010 to current (data was provided by the Secretariat (WCPFC Transshipment Events Database)).

Attachment: 1 Examination of the time series of longliner VMS information in the South Pacific (SPC-OFP).

Discussion

Longline

Annual catch estimates of SPA within the Convention Area from 2000 to 2011 averaged 56,463 mt, ranging from a low of 33,406 mt in 2000, to a recent high of 75,330 mt in 2010.

High seas catch estimates represent around a third to a half (29%-50%) of the total SPA annual catch, and range from 12,604 mt in 2000, to 28,050 mt in 2002, and 20,587 mt in 2011 (Table 1).

By flag, China and Chinese Taipei have the highest catch estimates of SPA in 2011 (11,869 mt and 12,483 mt respectively).

China has increased its estimated catch of SPA in recent years, from an average of 4,453 mt in the years 2000 to 2007 (inclusive), to a recent average estimated catch of 14,998 mt, in the years 2008 to 2011 (Table 1). Most of this recent catch was taken on the high seas.

Chinese Taipei SPA catch estimates average 10,903 mt from 2000 to 2011, ranging from 16,064 mt in 2002 to 7,609 mt in 2008, with an estimated catch in 2011 of 12,483 mt.

Chinese Taipei had historically higher catch estimates on the high seas, taking 14,412 mt in 2002; following a subsequent decline in catches, there has been a recent increase in reported catches to 4,705 mt in 2011.

The trends in the SPA annual catch estimates for China and Chinese Taipei vessels over the past decade may be influenced by changes in targeting from bigeye tuna to albacore tuna, and vice-versa.

The catch estimate for SPA in the Solomon Islands EEZ increased from 12,929 mt in 2009, to 21,938 mt in 2010, but was estimated to be 16,132 mt in 2011¹; noting the caveat on catch estimates if this 2011 figure holds, it was the largest catch in an EEZ in that year, representing 26% of the total catch and 38% of catches within EEZs. The next highest estimated EEZ catch of 6,475 mt was reported by the Cook Islands² (Table 1). There were no reports of Solomon Islands flag catches of SPA for the period 2005-2009. In 2010 the estimated catch by the Solomon Islands flagged vessels was 9,391 mt. The main reason for the large catches by this fleet since 2010 is the chartering of vessels from other flags.

¹ Solomon Islands flag catch reports for 2011 were not available in time for this paper, and SPC have used 2010 catch estimates as a proxy for 2011 during the interim.

² Logsheet data for the American Samoa fleet have not been provided so a number of assumptions to be made in EEZ albacore catch levels, which affect a number of EEZ catch estimates including those of the Cook Islands. These catch levels may therefore be overestimates

Table 1. Annual south Pacific ALBACORE longline catch estimates by EEZ and High Seas, 2000–2011

Notes: Available operational and aggregate logsheet data raised to annual catch estimates. “EEZ” are approximate 200-mile boundaries; “High seas” is the high seas in the WCPFC Convention Area, south of the equator. Allocation of FLAG catch to EEZ may be approximate due to the lack of operational logsheet data in some cases. . The breakdown of annual catch estimates by EEZ/High seas requires operational data, or the provision of annual catch and effort estimates by EEZ/high seas areas, neither of which have been provided for several key fleets. As a consequence, these estimates should be considered as very provisional until such time as complete operational data and/or annual catch estimates by EEZ have been provided for ALL fleets.

EEZ/ High Seas	ANNUAL SOUTH PACIFIC ALBACORE LONGLINE CATCH ESTIMATES BY EEZ AND HIGH SEAS											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
American Samoa	625	3191	5175	3113	1905	2864	4101	5188	3195	3504	3510	2344
Australia	360	554	504	392	587	622	2526	1866	1256	1471	706	627
Cook Islands		9	1095	1840	2156	2280	2005	2687	2337	4694	4924	6475
Fiji	5390	8037	6964	4579	6466	5995	6061	3830	4876	6011	4311	3983
High Seas	12604	22129	28050	25698	23989	22717	18406	15072	20733	27111	24164	20587
Jarvis (USA)				51								
Kiribati	268	741	758	644	833	241	303	802	254	711	985	715
New Caledonia	885	1015	1160	1087	1367	1579	1348	1312	1484	1611	1923	1732
Niue	0	3	40	9	7	55	259	216	337	241	219	
New Zealand	1334	2593	2522	2937	1246	602	496	277	382	422	460	414
Non-attributed non-high seas area	4	4	1	19	11	13	4	5	2	24	6	5
French Polynesia	3463	4261	4555	3813	2210	2255	2849	3924	3064	3560	3482	3223
Papua New Guinea	159	124	142	857	1681	2256	1860	1961	535	965	899	350
Solomon Islands	336	176	1073	931	2228	2999	6906	5132	8540	12929	21938	16132
Tokelau		18	190	98	128	31			33			531
Tonga	858	1074	846	319	197	256	405	354	220	124	57	76
Tuvalu	241	117	186	52	237	299	8	317	159	300	185	399
Vanuatu	2811	2827	2653	2818	3682	6907	8304	5975	6477	6768	5032	3551
Wallace and Futuna		1				34						3
Western Samoa	4068	4824	4207	2278	1235	1263	2113	3113	2342	2816	2529	1415
Total	33406	51698	60121	51535	50165	53268	57954	52031	56226	73262	75330	62562

Table 2. Annual south Pacific ALBACORE longline catch estimates by Vessel Nation, 2000–2011

Notes: Available operational and aggregate logsheet data raised to annual catch estimates.

By Flag	ANNUAL SOUTH PACIFIC ALBACORE LONGLINE CATCH ESTIMATES BY FLAG											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Australia (AU)	381	591	553	490	667	743	2591	1925	1277	1523	745	653
Belize (BZ)	194	4050	1472	885	353	7	0	164	7	26	10	105
Cook Islands (CK)		2	490	1358	1869	2371	2223	2644	2224	1551	2423	2182
China (CN)	2030	2495	2704	6003	5828	4026	7117	5424	15061	20118	12945	11869
Spain (ES)					2	2	0	0	33	35	6	3
Fiji (FJ)	6065	7971	8026	6881	11290	11504	11802	7145	9613	12515	9247	8166
Federated States of Micronesia (FM)	0	0		0	0	0	0	0	0	0	1	1
Japan (JP)	2254	3358	2637	3147	4010	4652	3371	2806	2435	2880	2972	2716
Kiribati (KI)	0	0		0					0		132	354
Korea (KR)	591	1728	2850	1394	743	2167	787	1035	1136	1142	882	548
New Caledonia (NC)	895	1020	1165	1111	1468	1590	1358	1324	1506	1649	1939	1736
Niue (NU)						55	213	216	337	154	97	
New Zealand (NZ)	1344	2614	2545	2971	1248	602	496	357	382	422	460	414
French Polynesia (FP)	3473	4261	4557	3846	2218	2426	2918	3957	3068	3560	3483	3225
Papua New Guinea (PG)	159	124	142	857	1681	2256	1811	1598	463	906	883	305
Solomon Islands (SB)	224	54	121	95	207	0					9391	9391
Tonga (TO)	862	1268	1189	611	182	283	414	390	220	124	57	34
Tuvalu (TV)												168
Chinese Taipei (TW)	9797	12817	16064	12196	8313	8616	8593	8542	7609	11947	13856	12483
United States of America (US)	1070	3872	6104	4258	2614	3058	4146	5298	3687	3937	4079	2753
Vanuatu (VU)		655	5279	3181	6239	7648	8001	6091	4825	7957	9192	4037
Wallis and Futuna (WF)												3
Western Samoa (WS)	4067	4820	4223	2253	1233	1263	2113	3113	2342	2816	2529	1415
Totals	33406	51700	60121	51537	50165	53269	57954	52029	56225	73262	75329	62561

Table 3. Annual south Pacific ALBACORE longline catch estimates by EEZ and Vessel Nation, 2000–2011

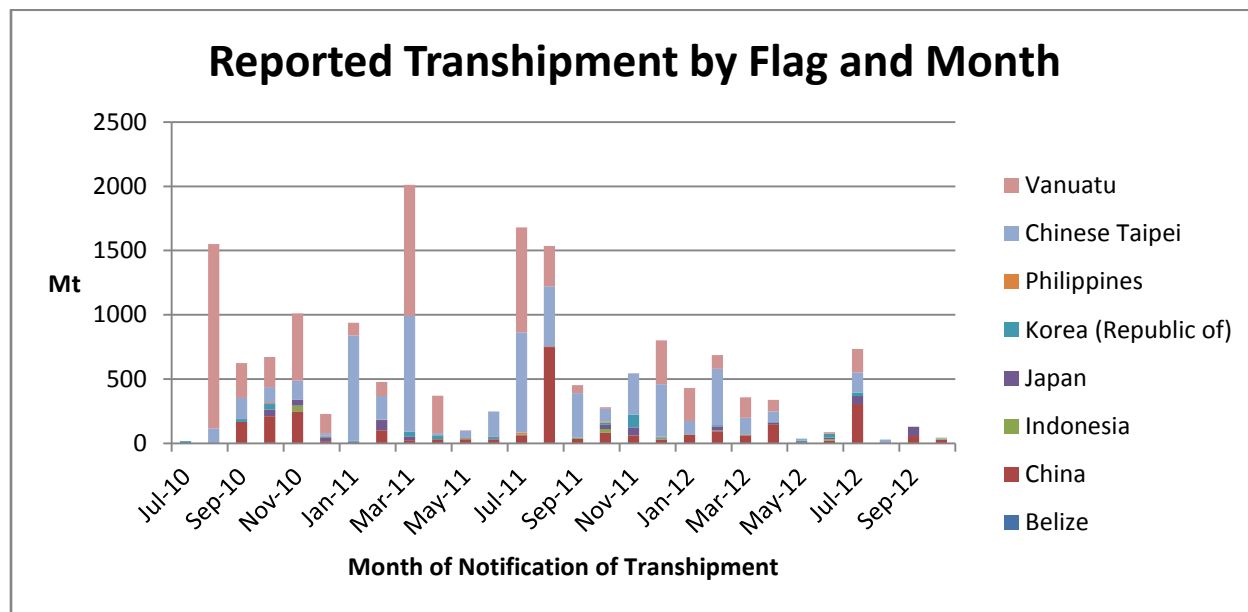
Notes: Available operational and aggregate logsheet data raised to annual catch estimates. “EEZ” are approximate 200-mile boundaries; “High seas” is the high seas in the WCPFC Convention Area, south of the equator. Allocation of FLAG catch to EEZ may be approximate due to the lack of operational logsheet data in some cases.

EEZ/high seas	Flag	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
American Samoa	US	625	3191	5173	3102	1905	2849	4078	5183	3195	3496	3499	2344
Australia	AU	360	554	504	392	387	622	2526	1866	1256	1471	706	627
Cook Islands	CK		2	488	1333	1866	2265	2005	2376	1918	1369	2205	2177
	CN												111
	FJ											107	679
	CT			11	12	0		0	311	64	972	231	202
	US		7	578	397	280	16			355	388	477	260
	VU				15	9					1964	1904	3047
Fiji	CN			77	10	92	108	38	78	152	385	107	183
	FJ	4980	7317	6243	4356	6301	5869	6018	3662	4709	5616	4192	3785
	KR		0									11	11
	NZ								80				
	CT	409	532	335	93	39	2	1	10	13	11	0	
	VU		187	309	120	33	1	6		2		1	5
High Seas	AU	22	37	48	99	80	121	65	58	21	52	39	26
	BZ	31	2800	1472	805	2	7	0	19	0	2		
	CK			0	14	3	6	83	157	180	31	60	5
	CN	2029	2413	2509	5652	5365	2588	5176	4468	12450	15065	9970	11131
	ES					2	2	0	0	33	35	6	3
	FJ	363	221	721	1287	2186	2263	2135	1042	1348	2126	1612	1344
	FM	0	0		0	0	0	0	0	0	0	1	1
	JP	2069	3170	2466	2911	3983	4531	2086	1764	1455	1648	1460	2295
	KR	284	1070	1837	1095	444	1787	308	452	419	580	553	219
	NC	8	1	4	23	94	10	8	12	22	38	16	4
	NU							2					
	NZ	10	21	23	35	2	0	0	0	0	0	0	
	PF	36		2	20	8	138	69	33	4		1	2
	SB	3	0		0	0							
	TO	4	194	344	293	3	27	9	36				
CT	7301	11279	14412	11331	6723	5337	3214	2576	1431	2419	3747	4705	
US	444	648	153	573	291	161	68	115	137	52	103	149	
VU		276	4058	1563	4803	5740	5183	4339	3233	5062	6596	703	
Kiribati	BZ					351							
	CN	1	82		48	9	0	0	0	1	93	128	20
	FJ												32
	JP	42	83	44	40	27	11	2			10	0	0
	KI	0	0		0					0		132	354
	KR	224	576	692	262	234	134	131	186	124	144	201	201
	CT	1	0	22	64	116	28	14	380	48	56	12	66
VU				230	96	69	156	236	82	408	512	42	

The transshipment data cover the period July 2010 to date and in general represents high seas transshipments only – however ambiguity in the regulations has resulted in some in-zone transshipment being reported to the Commission. Fluctuation in reported transshipments may reflect logistical/operational factors rather than fishing activity. It is noted that historically SPA would have been offloaded directly to canneries (e.g. Pago Pago, American Samoa, or Levuka, Fiji) rather than being transshipped. High volumes of high seas transshipment reported around August in 2010 and March and July/August in 2011 are not apparent in 2012 data so far. Figure 1 (Source: data presented in Table 7) below appears to indicate a decline in transshipment notifications, and this may be attributed to an increase in transshipments within EEZs.

Over the past decade, SPA annual catch estimates have increased for some Pacific Island fleets through domestication/joint ventures (e.g. Tuvalu flagged vessels reported catches of SPA for the first time in 2011, and Kiribati flagged vessels reported their first catches of SPA in 2010 and 2011), but continue to decline for others (e.g. Samoa and Tonga).

Figure1 Reported transshipment by flag and month (July 2010 to date)



Source: WCPFC Transshipment Events Database (6 November 2012)

Longline Vessel Numbers

Table 4 below lists the numbers of longline vessels registered on the RFV by flag state from 2006 to 2012. Around 50% of the vessels belong to Chinese Taipei. There has been an increase in registered vessels from 3,285 in 2006, to a maximum of 4,117 in 2010, and a current figure of 4,026 in 2012. However not all these vessels are actively fishing as shown in table 4b, which shows longline vessels that fished in the WCPFC Convention Area as reported by flag state. Although complete and detailed analysis is constrained by a lack of data, it appears that around 50% of the registered longline vessels are actively fishing in the WCPFC Convention Area, noting that this does not indicate how much fishing occurred.

Table 4a Longline vessels registered on the RFV by flag state from 2006 to 2012

Flag	2006	2007	2008	2009	2010	2011	2012
Australia	54	68	62	69	88	73	74
Belize			6	7	6	6	10
Canada		7	7	8			1
China	207	210	291	320	338	361	394
Chinese Taipei	1,677	1,719	1,656	1,572	1,885	1,921	1,924
Cook Islands	8	15	21	27	27	26	27
European Union	46	51	53	53	53	50	49
Micronesia (Federated State of)	5	18	21	27	26	32	25
Fiji	34	34	51	58	82	104	101
French Polynesia	94	93	94	95	95	95	95
Indonesia				166	167	168	183
Japan	753	763	831	855	842	630	634
Kiribati			3	4	5	5	5
Korea	194	170	166	202	195	196	198
Marshall Islands			4	4	4	4	4
New Caledonia	24	27	27	27	27	27	27
New Zealand			1	6	3	3	3
Papua New Guinea	20	20	22	25	21	26	22
Philippines	19	19	17	24	24	24	24
Tonga	5	5	5	6	6	6	2
Tuvalu					2	6	6
USA	92	117	122	152	158	158	133
Vanuatu	53	53	51	62	63	77	85
Total	3,285	3,389	3,511	3,769	4,117	3,998	4,026

Source: WCPFC RFV

Table 4b Longline vessels that fished in the WCPFC Convention Area as reported by the flag state.

Note: there is a clear problem with the 2009 record due to a non-reporting of active fishing vessels.

Flag	2008	2009	2010	2011
Unknown	4			
Australia	47	5	9	8
Belize	6	2	1	1
Cook Islands	20	4	15	15
China			248	278
Spain	17	9	5	5
Fiji	35	32	51	70
Federated States of Micronesia	25	25	18	28
Indonesia	2			80
Japan	561		73	395
Korea (Republic of)	2	94	2	124
Marshall Islands				4
New Caledonia			2	
New Zealand	1	1	1	1
Papua New Guinea	2		1	18
Philippines				6
Tuvalu	1			
Chinese Taipei	925	128	608	724
United States of America	131		142	134
Vanuatu	40			81
Total	1819	300	1176	1972

Source: WCPFC RFV

Trolling

Two flag states report trolling throughout the period 2000 to 2011, namely the USA and New Zealand. Since 2005 this activity has been reported only in the New Zealand EEZ and on the high seas (Table 5a). Average catch estimates for the period 2005 to 2011 for the high seas and the New Zealand EEZ are 388 mt and 2,344 mt respectively, and the latest catch estimates (2011) are 321 mt for the high seas and 2,798 mt for the New Zealand EEZ.

Table 5a. Annual south Pacific ALBACORE troll catch estimates by EEZ, 2000–2011

Notes: Available operational and aggregate logsheet data raised to annual catch estimates. “EEZ” are approximate 200-mile boundaries; “High seas” is the high seas in the WCPFC Convention Area, south of the equator. Allocation of FLAG catch to EEZ may be approximate due to the lack of operational logsheet data in some cases.

By EEZ	ANNUAL SOUTH PACIFIC ALBACORE TROLL CATCH ESTIMATES BY EEZ AND HIGH SEAS											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Australia	0	2	2	1	3							
High Seas	2768	2309	1503	2262	1336	665	708	325	151	237	307	321
New Zealand	3336	2736	3012	3721	3212	2855	2043	1736	3352	1794	1832	2798
Total	6104	5047	4517	5984	4551	3520	2751	2061	3503	2031	2139	3119

Table 5b. Annual south Pacific ALBACORE troll catch estimates by Flag, 2000–2011

By flag	ANNUAL SOUTH PACIFIC ALBACORE TROLL CATCH ESTIMATES BY FLAG											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
AU	0	2	2	1	3							
CK	335	202	166	688	376	89	121	53				
NZ	3336	2736	3012	3721	3212	2855	2043	1736	3352	1794	1832	2798
US	2433	2107	1337	1574	960	576	587	272	151	237	307	321
Total	6104	5047	4517	5984	4551	3520	2751	2061	3503	2031	2139	3119

Source: SPC-OPF data

Table 6 presents information on troll vessels registered on the WCPFC Register of Fishing Vessels (RFV). Although a relatively large number of vessels, initially Canadian and U.S., and latterly mostly from the U.S. are registered to fish, the number reported as actively fishing comparatively small, with just 10 reported in 2011.

Table 6 Troll vessels registered on the RFV by flag state from 2006 to 2012

Flag	2006	2007	2008	2009	2010	2011	2012
Authorised to fish							
Canada		153	153	165	17	1	4
USA	142	134	136	280	290	277	19
Reported by flag state as actively fishing							
USA			4		7	10	

Source WCPFC RFV

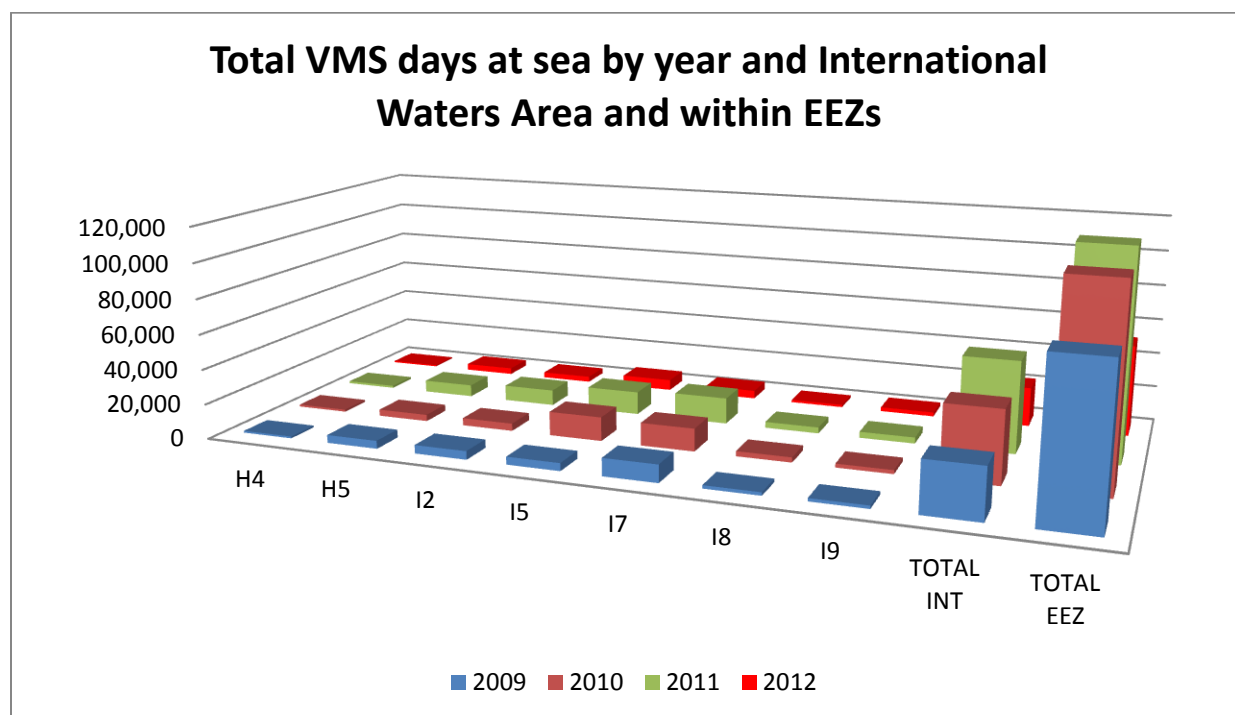
VMS

Longline VMS data analysed by SPC (Attachment 1) shows a clear increase in longliner activity within EEZs and on the high seas from 2009 - 2012³. Although 2012 data are incomplete, the data available up to mid-year appears to maintain the trend. As indicated in the explanatory text, the data and analysis is subject to a number of caveats. For example the large increase of longline VMS activity within EEZs from 2009-2011 is partly attributable to longline activity in the tropical areas of EEZs that is not targeted at South Pacific albacore.

Table A1 of Attachment 1 shows an increase in longliner VMS days both in EEZs and in international waters, with a greater rate of increase in international waters. The proportion of longliner VMS days in international waters versus EEZs increased from 25.0% in 2009 to 30.7% in 2011.

Figure 2 below visualizes the data for international waters presented in Table A2 of Attachment 1. It presents increases in the number of longliner VMS days at sea by international waters area and for comparative purposes the total VMS days at sea by year and within EEZs is included. Increases in all areas seen between 2009 and 2011, with the greatest activity apparently in areas I5 and I7 (see Fig A2 Attachment 1 for a map of the international waters areas). This may be partly due to the relatively large area of ocean included in these two areas.

Figure 2. Total VMS days at sea by year and International Waters Area and within EEZs



Source: Attachment 1, Table 2 (originally provided by SPC-OFP)

³ At the time of this analysis VMS data were available only up to mid-July 2012

Table 7. High Seas transshipment data for SPA, by flag and month from July 2010

Notes: 1. The requirement to report (within 15 days of transshipment) high seas transshipment commenced in July 2010, 2. The data refer to high seas transshipments, but a proportion of the catches will likely have been caught within EEZs. 3. Source: WCPFC Transshipment Events Database (6 November 2012).

Flag	2010					
	Jul	Aug	Sep	Oct	Nov	Dec
Belize					2.837	
China			166	210.668	247.192	17.091
Indonesia					44.17	0.869
Japan		0.9	0	53.543	45.937	30
Korea (Republic of)	16.984		22.303	41.89		6.389
Philippines				7.5		4.848
Chinese Taipei		115	165.552	125.298	147.809	20.582
Vanuatu		1435	270.6	232.293	521.63	148.835
Total	16.984	1550.9	624.455	671.192	1009.58	228.614

Flag	2011											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Belize							0.71					
China	5.073	101.989	24.854	31.588	31.987	29.524	61.905	748.608	34.656	82.198	63.458	28.013
Indonesia				0.794	8.277				8.322	29.668	0	7.22
Japan	10.85	79.731	30.354		1.85	5.777	0.822	5.8		32.364	62.036	4.687
Korea (Republic of)	4.66	3.017	38.109	29.416	5.622	16.595	3.678		1.225	18.124	98.599	6.276
Philippines				0.4		0.5	17.303	2.284		10.346		6.723
Chinese Taipei	818.356	182.858	898.65	17.416	52.06	194.711	778.188	465.695	346.645	94.959	320.851	406.94
Vanuatu	100	110	1020.165	290.97	0.597	0.7	816.794	313.038	62	12.857	0	341.175
Total	938.939	477.595	2012.132	370.58	100.39	247.807	1679.4	1535.43	452.848	280.52	544.944	801.034

Flag	2012									
	Jan	Feb	Mar	Apr	May	Jun	Aug	Sep	Oct	Nov
Belize							0.841			
China	67.701	95.807	61.927	149.477	8.602	20.149	305.884	0	56.467	29.221
Indonesia	1.894	4.82	1.9			11.505				9
Japan		31.016	1.774	12.999	1.575	13.449	61.858	2	72.544	
Korea (Republic of)	3.777	9.539	0.496	5.454	12.71	28.564	27.994			
Philippines			4.684							
Chinese Taipei	101.051	438.492	127.178	80.921	12.089	0	156.644	27.721		7.03
Vanuatu	256.233	108	161.242	90.28	3.063	13	179.9			
Total	430.656	687.674	359.201	339.131	38.039	86.667	733.121	29.721	129.01	45.251

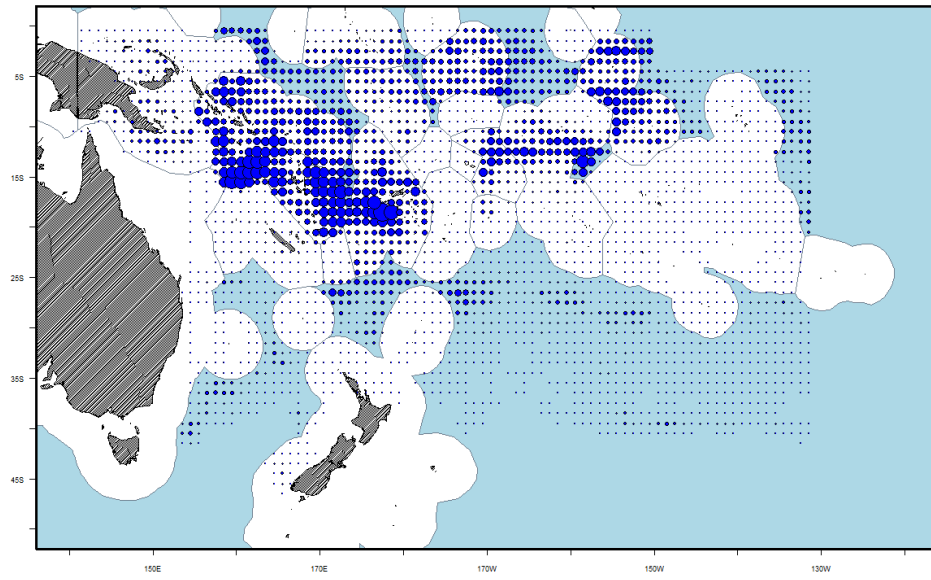
Attachment 1

Examination of the time series of longliner VMS information in the South Pacific

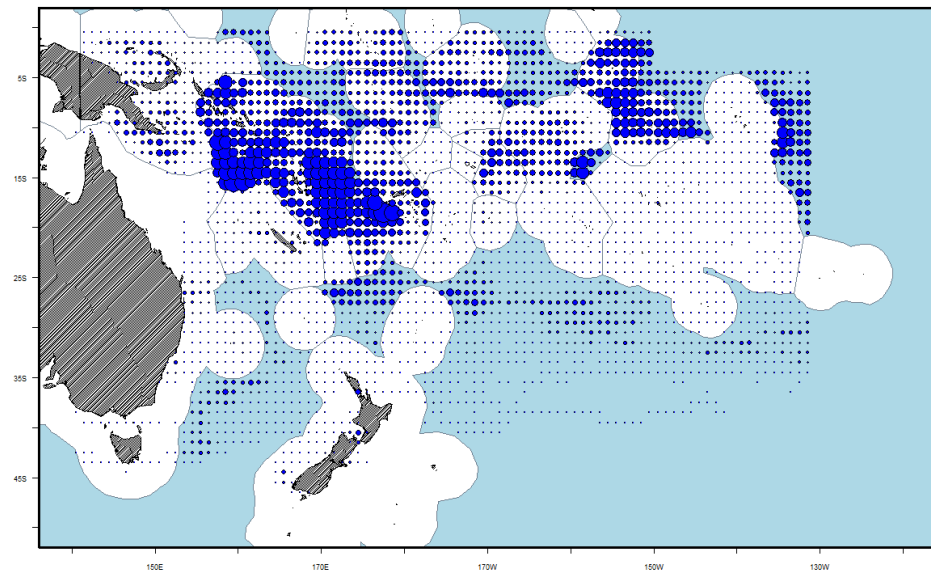
This analysis summarises the longline VMS information available to SPC through the FFA and WCPFC over the period 2009-2012, by geographic region of the South Pacific. Effort in that database corresponds to days at sea (i.e. includes fishing and transiting). Please note:

- At the time of this analysis VMS data were available only up to mid-July 2012;
- Effort represents total longline effort, not just that targeted at South Pacific albacore;
- VMS effort presented for EEZs includes that in archipelagic waters;
- Effort data for some countries (e.g. those with domestic longliners not on FFA VMS) will not be included within EEZ patterns;
- Effort for some countries (e.g. New Caledonia; French Polynesia) may be incomplete;
- Some trends may result from improved VMS coverage of vessels over time;
- EEZ effort excludes the Indonesian EEZ;
- High seas areas for the South Pacific areas are (Figure A2):
 - H4 = International waters between Tuvalu, Phoenix and Tokelau
 - H5 = International waters between Phoenix and Line groups
 - I2 = Doughnut hole between FSM, Solomon Islands, Kiribati, RMI, Nauru and Tuvalu
 - I5 = International waters between Phoenix and Line groups
 - I7 = high seas area to the east of Australia and New Zealand
 - I8 = high seas pocket between Fiji and Vanuatu
 - I9 = high seas pocket between the Cook Islands and French Polynesia

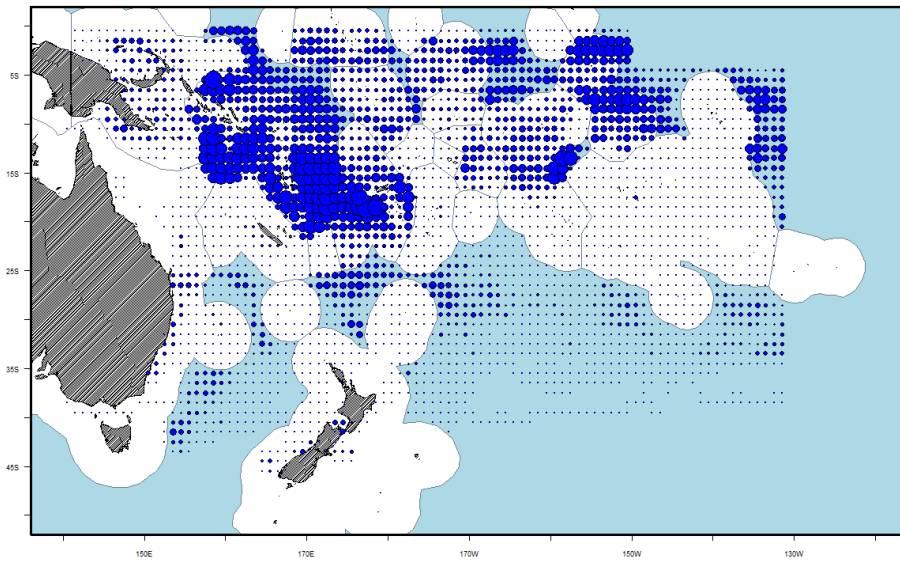
2009



2010



2011



2012

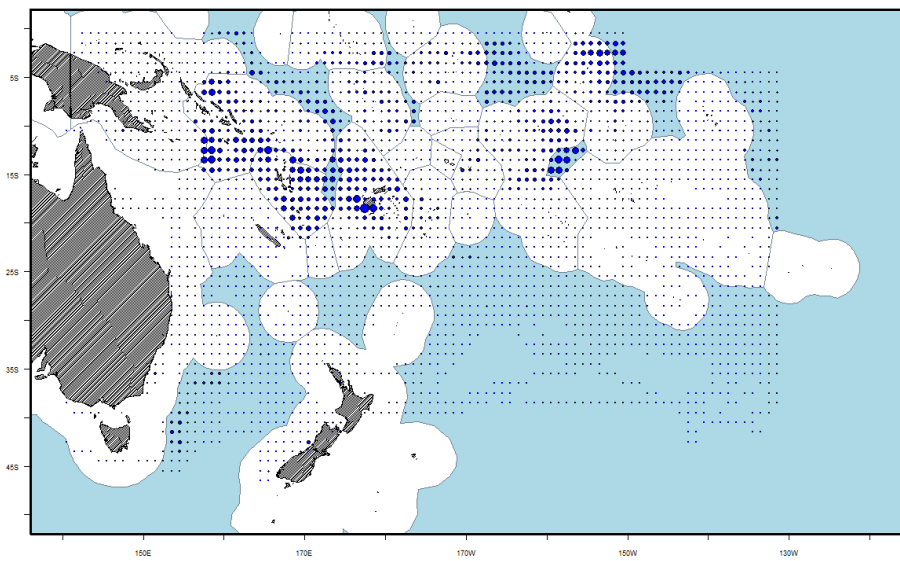


Figure A1. Distribution of longline VMS days at sea in south Pacific EEZs and International Waters at $1^{\circ} \times 1^{\circ}$. Max circle size = 1,266 days.

Table A1. Total VMS days at sea by year and geographic area

	2009	2010	2011	2012
EEZ	86,743	112,209	118,275	52,080
International waters	28,869	41,272	52,429	22,504
Total	115,613	153,481	170,704	74,585
% EEZ	75.0	73.1	69.3	69.8
%IW	25.0	26.9	30.7	30.2

Table A2. Total VMS days at sea by year and International Waters area (see Figure A2 for details)

International Waters Code	2009	2010	2011	2012
H4	1066	1210	1254	792
H5	4580	3733	6902	3708
I2	4863	4272	8993	3230
I5	4513	13749	13265	6288
I7	10178	13143	15032	4736
I8	1871	2944	3460	1398
I9	1799	2220	3521	2353
TOTAL	28869	41272	52429	22504

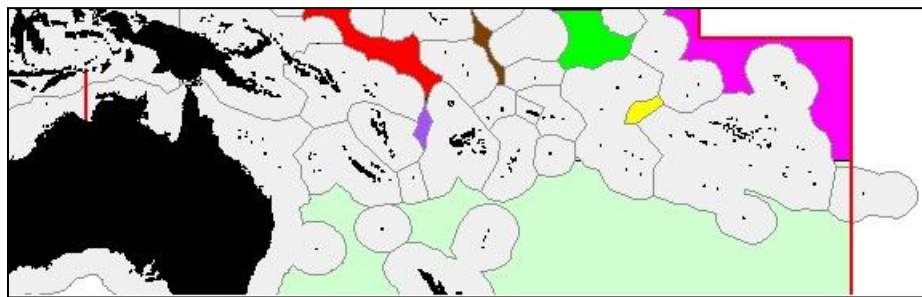


Figure A2. Map of International Waters in the southerly WCPFC-CA

Key:

Code	Area	Colour
H4	International waters between Tuvalu, Phoenix and Tokelau	Brown
H5	International waters between Phoenix and Line groups	Bright green
I2	Doughnut hole between FSM, Solomon Islands, Kiribati, RMI, Nauru and Tuvalu	Red
I5	International waters between Phoenix and Line groups and east of Line group	Pink
I7	High seas area to the east of Australia and New Zealand	Light green
I8	High seas pocket between Fiji and Vanuatu	Purple
I9	High seas pocket between the Cook Islands and French Polynesia	Yellow

