



**TECHNICAL AND COMPLIANCE COMMITTEE**  
**Fifteenth Regular Session**  
25 September – 1 October 2019  
Pohnpei, Federated States of Micronesia

---

**STATUS OF OBSERVER DATA MANAGEMENT**

---

**WCPFC-TCC15-2019-IP04 rev 2<sup>1</sup>**  
**25 Sept 2019**

Peter Williams, Aurélien Panizza, Colley Falasi, Eparama Loganimoce, Malo Hosken and Emmanuel  
Schneiter

Oceanic Fisheries Programme (OFP)  
Pacific Community (SPC)  
Noumea, New Caledonia

---

<sup>1</sup> Updates since **WCPFC-SC15-2019/ST IP-02**

- Figures 2, 3 and 4 are new and show the spatial coverage of Observer LL and PS data submissions.
- Tables 3 and 4 have been modified according to the SC15 recommendation to only report ROP coverage (i.e. it excludes fleets that are defined as non-ROP). This table is relevant to the WCPFC compliance evaluation.
- Tables 5 and 6 are new tables and responds to the SC15 recommendation to report the coverage of ALL longline observer data (i.e. ROP and non-ROP) in one metric so an overall measure of LL observer data coverage can be reported.

Updates since **WCPFC-TCC15-2019-IP04**

- Rev. 1 includes updated versions of Tables 1 and 2 based on higher coverage of observer placement data for 2018. (2 Sept 2019)
- Rev. 2 includes a revision to the caption in Table 8 and addition of note 2 in this table. (25 Sept 2019)

## 1. Introduction

1. Observer data management encompasses a number of activities that ensure the data collected by observers are made available for the work of the Western and Central Pacific Fisheries Commission (WCPFC) in a form that is both representative and of acceptable quality. The underlying activity involved in Observer data management is the management and entry of the observer data into a standardised database system, but it also covers the many other related activities with examples described in Williams (2011).

2. The Pacific Community's (SPC) Oceanic Fisheries Programme (SPC-OFP) has been processing observer data on behalf of its member countries for more than 15 years. The Seventh Regular Session of the WCPFC (6–10 December 2010) approved the continuation of this work in respect of the Regional Observer Programme (ROP) data in the short- to medium-term (Anon., 2010a, Anon., 2010b). The Fifteenth Regular Session of the Commission (9–14 December 2018; Anon., 2019) reconfirmed the Commission's support for ROP data processing with its inclusion in the indicative budget for the period 2019-2021.

3. The Pacific Island Forum Fisheries Agency (FFA) processes observer data for the US Multilateral Purse Seine Treaty and these data are regularly incorporated into the ROP data submitted to the WCPFC. Staff supported by the WCPFC Regional Observer Programme (ROP) data management project based at the WCPFC Secretariat mainly process data from the national observer programme of the Federated States of Micronesia (FSM). WCPFC members other than Pacific Island countries have also contributed to the ROP Database including Australia, China, EU, Japan, Korea, New Zealand, Philippines, Chinese Taipei and the USA.

4. The majority of the observer data processed by the SPC are ROP-defined purse seine trips<sup>2</sup>, which have been designated as the highest priority for processing since 2010. However, the WCPFC requirement for 5% observer coverage in the longline fishery (established in 2012) has resulted in increased submission of observer longline data in recent years and these data are now assigned equal priority for processing as the purse seine observer data. The SPC-OFP also processes non-ROP observer data that are, *inter alia*, of importance to the scientific work of the WCPFC and so have been included in the description of observer data management and data summaries presented in this paper.

5. SPC-OFP has also been provided with a significant amount of data generated from E-Monitoring initiatives undertaken by several Pacific Island countries in recent years. These data are aligned to the ROP minimum data standards but are considered as a different data source to data collected by human observers. Summaries of data generated from E-Monitoring initiatives have been included in this paper.

6. This paper serves to provide an update on the status of ROP data management at SPC-OFP over the past twelve months, covering the following:

- Human resources involved in observer data management at SPC-OFP
- Activities over the past 12 months
- Status of observer data entry, data provisions, coverage and issues, and
- Future expectations.

---

<sup>2</sup> CMM 2007-01 paragraph 5

### **Scope of the Commission ROP**

5. *The Commission ROP shall apply to the following categories of fishing vessels authorized to fish in the Convention Area in accordance with the Commission's Conservation and Management Measures 2004-01:*

- i) *vessels fishing exclusively on the high seas in the Convention Area, and*
- ii) *vessels fishing on the high seas and in waters under the jurisdiction of one or more coastal States and vessels fishing in the waters under the national jurisdiction of two or more coastal States.*

7. The SC is encouraged to review the information in this paper and provide suggestions for enhancements for future WCPFC meetings, as required.

## 2. Human Resources for managing observer data

8. Williams et al. (2016) provides a summary of the team and positions directly involved in managing and entering observer data, fully supported under the WCPFC ROP Data Management project; this document lists the other SPC-OFP staff that are also involved in this area. With the deployment of the new Tufman 2 observer component over the last two years, at least two more SPC-OFP staff are now involved in supporting observer data management throughout the region (e.g. part of the work of the Training Advisor/Analyst and Junior Professional Officer/Data management involves the provision of support to countries via the SLACK helpdesk).

9. There were two changes to staffing levels over the past twelve months – Mr Aurélien Panizza (previously the Observer Data Quality Officer) replaced Mr. Icanus Tuiloma as the new Observer Data Manager, and Mr Colley Falasi re-joined the SPC-OFP team as the Observer Data Quality Officer.

## 3. Activities over the past twelve months

10. The work related to observer data management achieved over the past twelve months includes,

- SPC technical staff continued to provide remote technical support to the observer data entry staff based at the offices of the WCPFC Secretariat. Further progress was made in refining the process for transferring WCPFC ROP data to the WCPFC Secretariat, but there remains some areas to improve the efficiency of the Secretariat receiving observer data in a timely manner.
- Further development of the Tufman 2 (Observer component) was undertaken during the past year, including:
  - the addition of the observer debriefing module;
  - the addition of the pole-and-line observer data module;
  - Enhancement of the data quality control (error checking) system and the deployment of a dedicated APP for third-party technical service system providers to use;
  - The development of an E-Reporting system (OLLO) for observers active in the South Pacific albacore longline fishery;
  - Enhancements to the Tufman 2 mapping feature which allows users to view overlays of observer-reported fishing activities with logbook-reported data.
- SPC technical staff continued to provide regular support to other countries and regional agencies processing observer data using the Tufman 2 observer component, including visits to FSM, Fiji, Philippines, PNG, French Polynesia and Solomon Islands (FFA) over the past year.
- Remote (and some direct) support was provided to Fiji, RMI, FSM and Palau to assist with quality control of data generated from E-Monitoring systems and assistance on the use of DORADO reports, which summarise EM data and provide comparisons of EM data to other types of data (logbook, onboard observer and port sampling data).
- The most time consuming work over the past year for the observer technical staff continued to be the development and update of data loaders for the non-standard<sup>3</sup> observer data provided by several CCMs for their national observer programme data. Over the past year, non-standard longline observer data have been provided for the following fleets/years: Australia (2017–2018; E-Monitoring data), China (2018), Japan 2017–2018), New Zealand (2018), EU (2018), US (Hawaii/American Samoa 2018), Korea (2018), Chinese Taipei (2018) and Vietnam (2018). Most of

---

<sup>3</sup> We refer to “non-standard” as observer data that are not entered using the Tufman 2 system, or do not align to the WCPFC ER observer data field standards (i.e. they are provided in different formats by CCMs which requires the development of specific data loaders)

the non-standard observer data have now been loaded, although some data have issues which require manual intervention and/or referral to the original source of the data (and has proved very time consuming).

- Data collection systems in the countries providing the non-standard observer data need to satisfy national requirements and often do not align exactly to regional observer database (ROP) structures, which presented significant challenges in developing the loaders and follow-up/liaison with the providers of the data. Even though loaders for non-standard data had been developed in previous years, changes to the format of data submitted from one year to the next requires an update to the loader and careful attention to the correct field mapping.
- However, there has been a significant development over the past 12-18 months with several countries (US–Hawaii, US–American Samoa, Korea and Chinese Taipei) now using the WCPFC E-reporting observer data field standards<sup>4</sup> to submit their observer data. Japan has also liaised with SPC-OFI over the past 12 months to change their observer data submission format to align to the WCPFC ER observer data standard, which has now been achieved, as of September 2019. This development has significantly reduced the time taken to load the observer data provided by these countries, and these data are now more readily available for the work of the Commission, and for that, the scientists and other users of the data are very appreciative.
- The online web-based Observer (DORADO) database-reporting module continues to be enhanced and used regularly by national observer providers, the WCPFC and FFA Secretariats and several other CCMs. This system continues to be used by Pacific Island countries in preparation of the WCPFC Part 1 and Part 2 reports for submission, and the system will continue to expand and evolve over the coming years to meet the requirements of not only national observer programmes, but also SPC, the WCPFC Secretariat, FFA and PNAO.
- The data generated from trials using E-Monitoring (EM) systems have evolved significantly over the past three years, with data from more than 286 EM trips for 2017, and 137 for 2018 now available from Pacific Islands trials. Acknowledging the potential for this source of data for member countries and the work of the Commission, Section 5 of this paper provides a brief summary of an initial evaluation of the EM data.

#### 4. Status of Observer data entry, data provisions and issues

11. Table 1 shows the status of observer data received and entered by SPC as at 8<sup>th</sup> July 2019 and Table 2 provides an indication of the available purse-seine observer data processed by fleet. Table 3 shows the coverage of Regional Observer Programme (ROP) longline activity for 2017 as nominated by the flag state and according to the metrics proposed at TCC10<sup>5</sup> and agreed at WCPFC11<sup>6</sup>, and Table 4 shows the coverage of Regional Observer Programme (ROP) longline activity for 2018, as nominated by the flag state. Tables 3 and 4 also provide an indication of the longline Regional Observer Programme (ROP) data submitted to WCPFC/SPC by year and fleet, and the coverage of the data provided; this allows a comparison to the coverage nominated by the flag state and is used to evaluate compliance in achieving the required ROP longline coverage of 5%.

12. Pacific Island observers and programmes generate most of the observer data used by the Commission and Table 5 provides an indication of the extent of data generated in recent years. There has also been a significant amount of data generated from E-Monitoring over the past 2-3 years, and an attempt to quantify these data has been made in Tables 6 and 7, and an indication of the potential for these data to be used for WCPFC science included in Section 5.

<sup>4</sup> [https://www.wcpfc.int/doc/data-05/e-reporting\\_ssps](https://www.wcpfc.int/doc/data-05/e-reporting_ssps)

<sup>5</sup> See the TCC10 paper at <http://www.wcpfc.int/node/19567>

<sup>6</sup> See the WCPFC11 report at <http://www.wcpfc.int/node/20349>, para 477 and Attachment L, Table 1

13. As noted in this paper in previous years, the summaries of observer data provisions presented herein continue to be constrained by a number of factors [see Williams et al. (2017) for the details of each factor], including:

- i. Accurate information on the complete number of vessel trips by gear and flag in the WCPFC Convention Area.
- ii. Accurate information on the actual number of observer trips by observer programme, gear and flag.
- iii. Assignment of an ROP trip in the unprocessed data.
- iv. Lags in the uploading of observer data received in 'non-standard' format, although recent developments (see Section 2) have improved this situation.

#### 4.1 Purse seine

14. Provisions of purse seine observer data for years 2012–2017 have been described in previous versions of this paper.

15. Observer data for an estimated 70% (1,454 trips out of 2,271 trips according to VMS data) of observer purse seine trips conducted during 2018 have been received at SPC at the time of writing this paper (the data received represents 91% of the trips with known observer placements in 2018). This is a significant improvement on the provision of 2017 data at this stage last year, when the coverage was only 28%. The current coverage of 2017 observer data received at SPC is now an estimated 81% (1,535 trips) of the total estimated purse seine trips (2,172 trips according to 2017 VMS data), with a coverage of 88% for trips with known placements.

16. A total of 81% (1,297 trips) of the observer data received (1,454 trips) at SPC for 2018 observer activities have now been entered (excluding the trips awaiting resolution at SPC). SPC employs a strategy of processing the most recent observer data (in this case 2018 data) as highest priority, mainly to ensure CCMs can satisfy their Part 1 and Part 2 reporting obligations (for which compliance applies to the most recent year). This is reflected in the “**% of trips received without problems**” in **CATEGORY 5** of Table 1 whereby the outstanding data entry for 2018 (for example) had a higher priority than the outstanding trips to be entered in earlier years, and therefore a higher proportion in this column. The outstanding trips for earlier years will be entered once the current priority for 2018 data entry has been achieved (i.e. resolving the outstanding issues in trip data already received and working with observer programmes in regards to the submission of trips not yet received). For the 2018 purse seine trips received at SPC, about 2% (34 trips) have problems awaiting to be resolved (mainly issues with scanning or incomplete data submitted), but a significant improvement on previous years nonetheless.

17. The breakdown of processed purse-seine observer data by fleet (Table 2) shows that the coverage of 2018 observer data submitted to SPC is generally high, with respect to observer data with known placements. The observer data for Ecuador and El Salvador fleets are anticipated (these trips are usually conducted as IATTC cross-endorsed trips and there is a delay for the data to flow back to the observer provider and then on to SPC).

18. Figure 1 highlights the clear improvement in the provision of 2018 purse seine observer data compared with the provision of 2017 data. The best way to interpret these graphs is to understand that having more trips (blue bars) to the left of the red line represents the more timely provision of observer data, but having more trips (blue bars) to the right of the red line means progressive lags in the provision of data. The timely provision of 2018 observer data has meant that more data for the most recent calendar year were available for the scientific work required for SC15 than in recent years.

19. As reported in previous years, the 'problematic' trip data held at SPC awaiting resolution are mainly due to (i) incomplete or poor quality scanned data submissions, or (ii) issues in the data which result in the trip being set aside pending further information/review, all of which prevent the trip data being entered.

20. It is important that the observer trip data rejected by the observer programmes still be submitted to ensure all observer trip data are available, and that the problems encountered can be reviewed and referred to in future training, debriefing and data quality control procedures. Information on the trips “with unknown status” will require follow-up with flag and observer service providers, in the absence of any observer trip reporting obligations. Provision of a list of ALL observer trips conducted by each observer service provider on a regular basis would enhance the summary reports presented in this paper. The lack of provision of ‘observer placement lists’ from most national observer programmes remains a major issue.

21. We also highlight the importance of observer service providers submitting debriefing evaluations/scores to allow the assignment of appropriate data quality indicators to the data. In the future, we plan to work with observer providers to resolve the backlog of observer debriefing data, and incorporate debriefing data from the PNA FIMS observer-debriefing component into the regional observer database. We anticipate reporting summaries from the observer debriefing data in future versions of this paper.

22. Figure 2 provides an indication of the spatial coverage of the purse seine observer data for 2018, noting that the domestic fisheries of Indonesia, Philippines and Vietnam are not shown. The spatial coverage of available purse seine observer data for 2018 is clearly representative of fishing effort (even though coverage of available observer data is not yet 100%).

#### 4.2 Longline

23. SC11 directed SPC to present a table of longline ROP coverage which included both the coverage reported by each CCM for their longline fleet and the coverage of that fleet according to data provided to the WCPFC; Tables 3 and 4 have been prepared in response to this recommendation for longline ROP coverage for 2017 and 2018 respectively.

24. Previous versions of these tables included the trips for fleets that are restricted to the home EEZ/adjacent high seas only (which are defined as non-ROP). The 15<sup>th</sup> WCPFC Scientific Committee (SC15), held in Pohnpei, FSM in August 2019, recommended that future versions of Tables 3 and 4 exclude the non-ROP defined data and only report on ROP longline coverage – this recommendation has been actioned with adjustments to Tables 3 and 4 in this paper.

25. In addition to the adjustments for Tables 3 and 4, two new tables have been added (Tables 5 and 6) which provide a breakdown of all longline observer data (ROP and non-ROP) provided to the WCPFC Science Service Provider for Commission work, covering 2017 and 2018 respectively. These tables use the common longline effort metric (hooks), and indicate that overall coverage was 5.2% and 5.0% (respectively for 2017 and 2018) according to data provisions to date.

26. The positive development with some CCMs providing data aligned to the WCPFC ER observer data standards has improved the timeliness of loading the ‘non-standard’ observer data, although some provisions of data for the most recent calendar year (2018) have only recently been provided and were too late for inclusion in analyses undertaken for SC15.

27. Figures 3 and 4 provides an indication of the spatial coverage of all longline observer data (ROP and non-ROP) provided for 2017 and 2018, respectively. Spatial coverage of longline observer data has improved during the past two years.

#### 4.3 Contribution of Pacific Island observer programmes

28. Table 7 provides a breakdown of observer data collected by each Pacific Island (PIC) observer programme for 2017 and 2018. For purse seine, the PIC observer data currently cover 82.7% of the tropical

WCPFC fishery (based on total tuna catch estimates for the tropical fishery) for 2017, and 67.7% for 2018. For longline, the PIC observer data currently covers 1.05% and 1.08%, respectively for 2017 and 2018, based on total WCPFC tuna catch estimates.

## 5. Potential use of E-Monitoring data for WCPFC science

29. The amount of data generated from longline E-Monitoring (EM) trials continues to increase and offers considerable potential to support the work of the Commission. The decision to proceed with the WCPFC Project 93 (“*Review of the Commission’s data needs and collection programs*”<sup>7</sup>) is an acknowledgement that data generated from E-Monitoring systems should be considered independent of data collected by on-board observers.

30. Table 8 provides a breakdown of the processed EM data (for 2017 and 2018) made available to SPC, with an indication of the coverage by fleet (based on “trips” for the Pacific Island trials, and “sets” for the Australian longline fishery). Previous versions of this paper have listed the current EM initiatives in the region, most of which have also been described and presented in detail at WCPFC meetings in the past.

31. SPC-OFP is currently investigating the potential of Longline EM data to be included in existing data sets that are used in the scientific work of the Commission. At this stage, the review is focussing on three components of the available Longline EM data, which would provide a useful addition to existing WCPFC science data sets.

- **Length Frequency data.** Length frequency data are primarily used in stock assessments. These data are obtained from Longline EM video through a digital measuring tool, which requires careful calibration. An initial evaluation has been conducted with a comparison of the EM length data with length data collected by port samplers and on-board observers. The main finding at this stage is understanding the quality of each data set – there may be issues in each data source which are not apparent, and as such, there is no valid ‘control’ data set to test against the EM data. Essentially, errors may be present due to the misuse of measuring tools (i.e. calipers), and in the case of the EM, fish measured too far beyond the area on deck where the calibration of the digital measuring tool was undertaken which could produce erroneous lengths (to be investigated). Ideally, a fish-by-fish comparison for paired EM/observer trips would be required, but the linking (of fish from one source to the other) requires substantial manual work due to the differences in the catch-event time from the respective data sources. Fish-by-fish links of EM data to port sampling data would require some form of tagging fish on-board. It is clear that the EM digital measuring tool, used correctly (and within the area it has been calibrated for), has produced validated length data (as would be the case with the other measurement tools). One potential enhancement to EM systems would be to include a feature to warn the EM analyst if the digital measuring tool is used outside the area for which that tool was calibrated.
- **Species composition data.** These data are used, *inter alia*, for the estimation of bycatch species catches. Comparisons of species composition from EM data and observer data generally show a close alignment for bycatch species that are landed on the deck, although species identification of fish discarded (e.g. struck off) without landing presents a challenge for EM.
- **Gear selectivity by time and area.** The collection of the hook number (between successive floats) of each catch event provides an indication of the selectivity of the gear with respect to depth, which is important for standardising CPUE, an input to stock assessments. An initial evaluation show that the EM data appear to be informative for gear selectivity and align well with trends shown from on-board observer data.

---

<sup>7</sup> See page 122 of <https://www.wcpfc.int/node/31774>

32. The review acknowledges that there are other components of EM data currently collected, which can potentially be of use to member countries and to the WCPFC. As components of EM data are demonstrated to be acceptable for scientific use, formal authorisation from respective member countries will be required before they can be used for Commission scientific work. The WCPFC Project 93 should ultimately lead to some formalisation of minimum standard EM data fields.



## 6. Summary and Future expectations

33. There are several observer data entry teams<sup>8</sup> operating throughout the region entering data into the Tufman 2 observer component. This system is primarily supported by the two technical positions (Observer Data Manager and Observer Data Audit Officer) based in SPC Noumea, but also by other SPC-OFP staff will continue to assist member countries using this system via the SLACK Helpdesk.

34. There has been a clear improvement in the timeliness of purse seine observer data over the past year (see Figure 1 and Section 4.1, para. 18 above), which is encouraging and we thank all observer providers for their work in ensuring data have been provided in a more timely manner.

35. Further refinement of the observer module under TUFMAN 2 is expected in the coming year, including the uptake of observer debriefing data. A review of the DORADO reporting tool is currently underway with consideration for a new more user-friendly interface and structure. Comprehensive trials of the new longline E-Reporting tool (*OLLO*) will be also be expected over the coming year, with a report on progress in future versions of this paper.

36. The significant development in several CCMs submitting observer data aligned to the WCPFC E-Reporting observer data field standards over the past year is greatly appreciated, and SPC-OFP will continue to work with other CCMs (providing 'non-standard' data) to determine whether it will be possible for them to consider using the WCPFC standards.

37. SPC-OFP will continue to be involved in observer E-Reporting and E-Monitoring trials in collaboration with their member countries and other regional agencies in the coming years, if and when national fisheries authorities are adequately resourced and prepared to venture down this path. SPC will also continue to collaborate with other E-Reporting projects involving observer data, as required.

38. SPC-OFP will continue to work closely with the WCPFC Secretariat over the coming year on the following areas:

- Provide ongoing support to enhance the WCPFC ROP database to align with the requirements of the WCPFC Compliance Case system;
- Where required, continue to provide technical advice and support to address the recommendations from the WCPFC E-Reporting and E-Monitoring Working Group (next meeting planned for 2020);
- The provision of technical advice and support with the Secretariat and other sub-regional agencies related to the WCPFC Project 93 (*“Review of the Commission’s data needs and collection programs”*), and the convening of a SPC/FFA/PNAO Longline E-Monitoring planning workshop to be conducted in October 2019;
- Continued support for the WCPFC/NORMA observer data entry (now using the Tufman 2 web-based system);
- Continued support (technical and training) related to the web DORADO observer reporting tool;
- Continued support in responding to requests to disseminate ROP data according to the WCPFC data dissemination rules;
- Continued work in satisfying WCPFC requirements for ROP data reports mainly aligned to their requirements for CMM monitoring.

39. SPC-OFP will also continue to work with the Pacific Islands Forum Fisheries Agency (FFA) and the PNA office to improve efficiencies in observer data management and dissemination (according to established data sharing rules), particularly in regards to data flow and reporting tools for the benefit of SPC-OFP/FFA/PNA member countries.

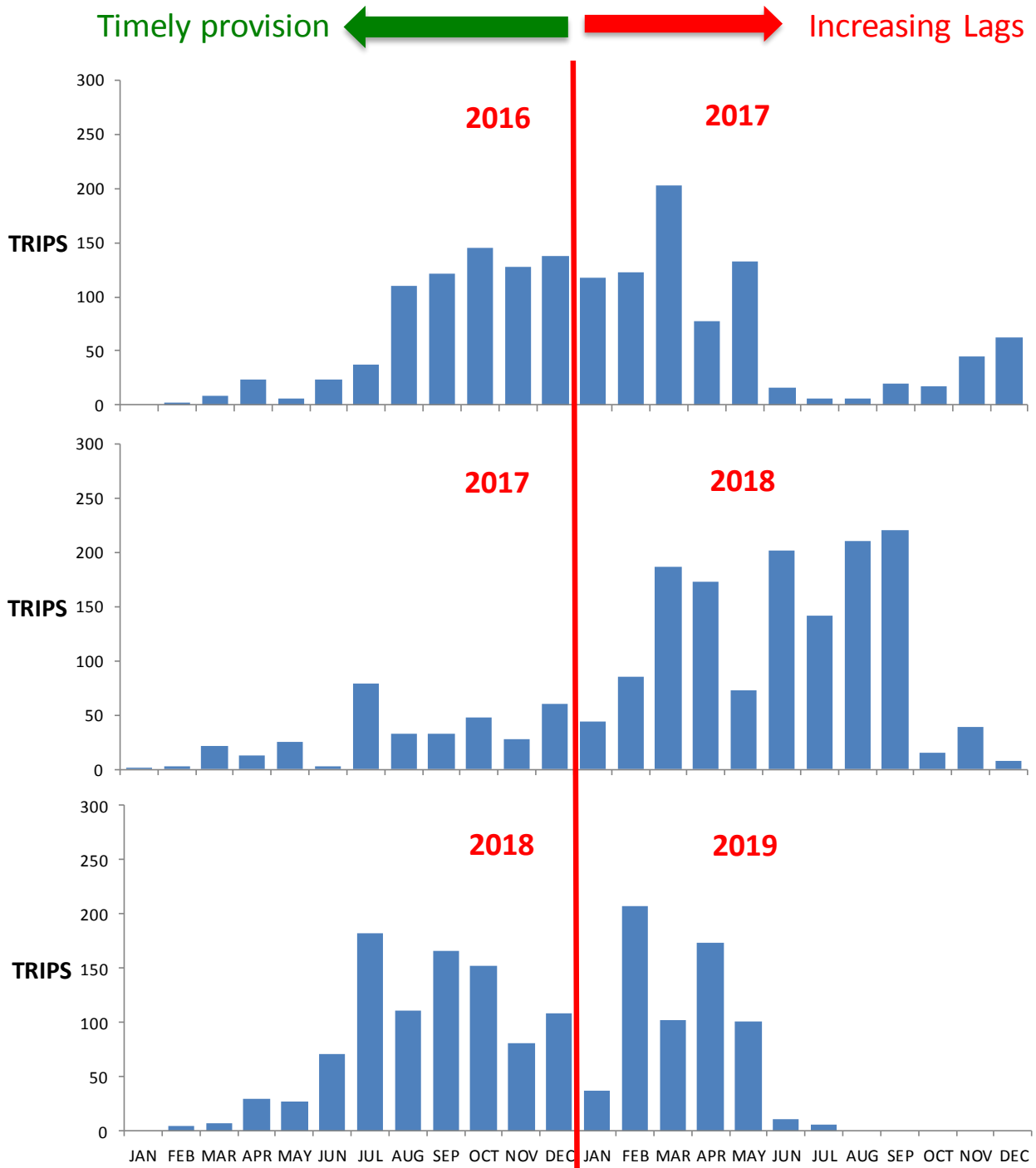
---

<sup>8</sup> SPC Noumea, WCPFC Secretariat, FFA, Philippines, Fiji Fisheries and Tonga are undertaking observer data entry.

## 7. References

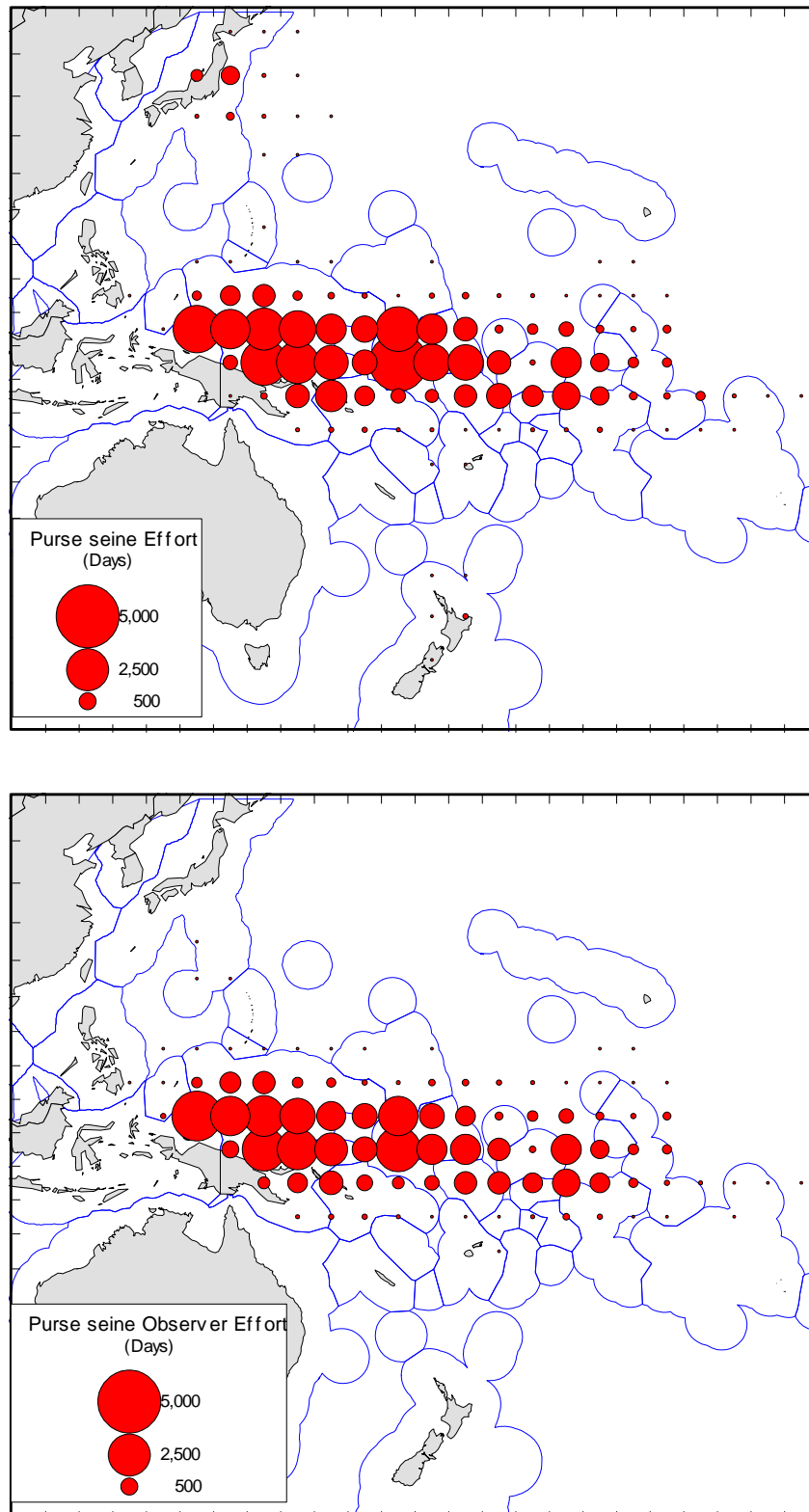
- Anonymous. 2010a. Report of the Seventh Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. 7–11 December 2010, Honolulu, Hawaii, USA. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.
- Anonymous. 2010b. Annual Report to the Commission – Regional Observer Programme. Meeting Document WCPFC7-2010/26. Seventh Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC7). 7–11 December 2010, Honolulu, Hawaii, USA. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.
- Anonymous. 2019. Report of the Fifteenth Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. 8–14 December 2018, Honolulu, Hawaii, USA. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.
- Williams, P.G. 2011. Status of Observer data management. Information Paper SC7 ST IP–6. Seventh Regular Session of the WCPFC Scientific Committee (SC7), 9–17 August 2011, Pohnpei, FSM. Oceanic Fisheries Programme, Secretariat of the Pacific Community, Noumea, New Caledonia.
- Williams, P.G, I. Tuiloma & C. Falasi. 2016. Status of ROP Data Management. SC12 ST-IP-02. Twelfth Regular Session of the Scientific Committee of the WCPFC (SC12). Bali, Indonesia. 3–11 August 2016.
- Williams, P.G, I. Tuiloma & A. Panizza. 2017. Status of ROP Data Management. SC13 ST-IP-02. Thirteenth Regular Session of the Scientific Committee of the WCPFC (SC13). Rarotonga, Cook Islands. 7–19 August 2017.
- Williams, P.G, I. Tuiloma & A. Panizza. 2018. Status of ROP Data Management. SC14 ST-IP-02. Fourteenth Regular Session of the Scientific Committee of the WCPFC (SC14). Busan, Republic of Korea. 8–16 August 2018.
- Williams, P.G. 2019. Scientific Data to be provided to the Commission. SC15 ST-WP-01. Fifteenth Regular Session of the Scientific Committee of the WCPFC (SC15). Pohnpei, FSM. 12–20 August 2019.

FIGURES

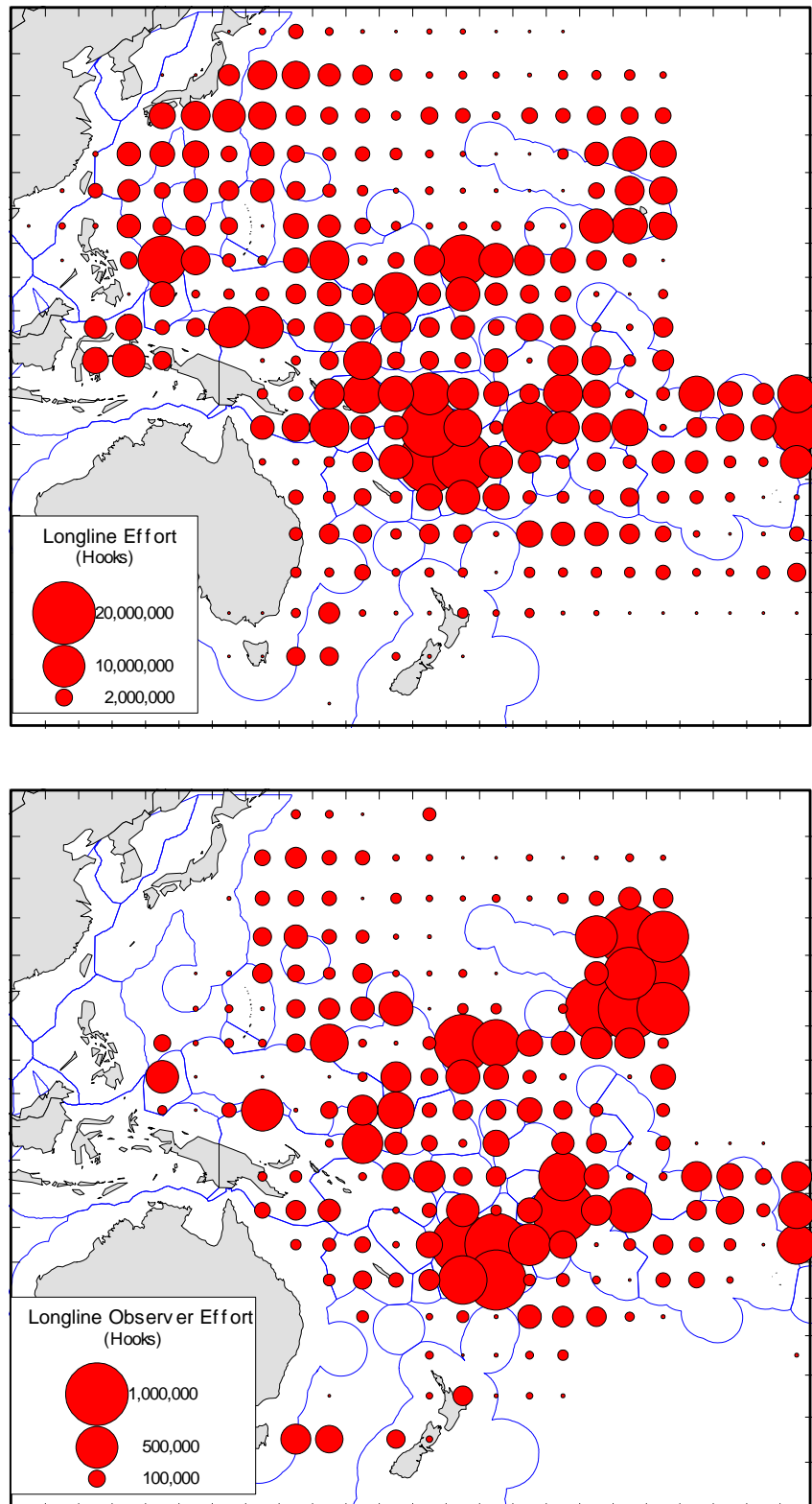


**Figure 1. Monthly frequency of provision of 2016 (top), 2017 (middle) and 2018 (bottom) purse seine observer data**

X-Axis represents the year/month when respective observer data were received. For example, the top graph represents when provisions of 2016 observer data were received at SPC throughout the months of 2016–2017. Provisions of data to the left of the red line indicate timely provisions, provisions to the right indicate increasing lags.



**Figure 2. Distribution of Purse seine effort (top) and Observer coverage (bottom) in the WCPFC Area for 2018. (excludes Indonesia, Philippines and Vietnam domestic fisheries)**



**Figure 3. Distribution of Longline effort (top) and Observer coverage (bottom) in the WCPFC Area for 2017**

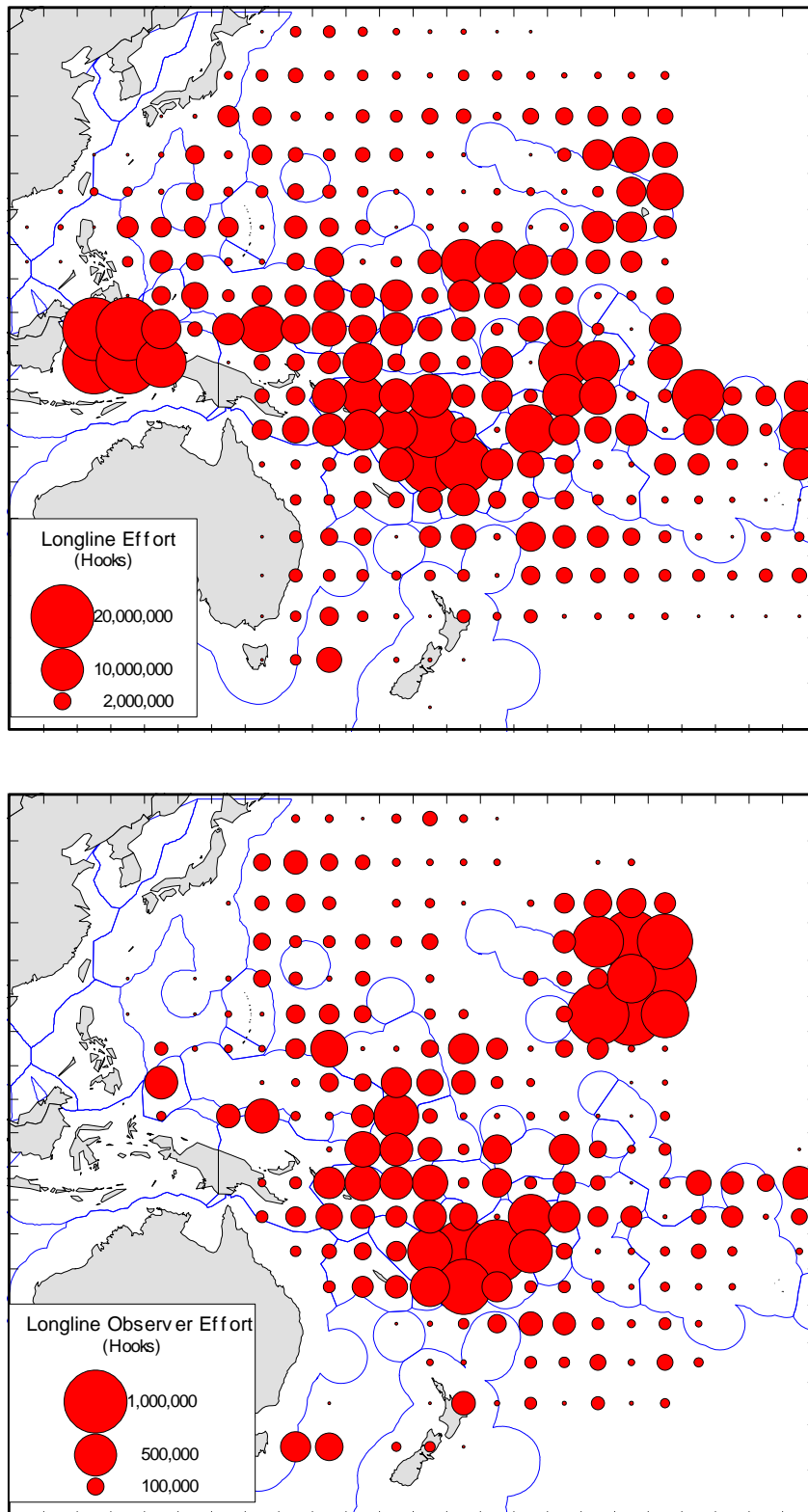


Figure 4. Distribution of Longline effort (top) and Observer coverage (bottom) in the WCPFC Area for 2018

## TABLES

**Table 1. Summary of the provision and processing of Purse seine Observer data** (Different colours represent categories – see NOTES below)

As at September 2019															
YEAR	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements		4. TRIP data submitted		5. TRIP data processed				6. Problems awaiting resolution			7. TRIPS not yet sent by Obsv. Progs.	
			Trips	%	Trips	%	Trips	% of Estimated trips	% of total available trips	% of trips received without problems	Trips	% of total available trips	% of received	Trips	% of total
2015	2,260	512	1,748	77%	1,687	97%	1,620	72%	93%	99%	48	3%	3%	61	3%
2016	2,195	399	1,796	82%	1,769	98%	1,602	73%	89%	93%	40	2%	2%	27	2%
2017	2,182	423	1,759	81%	1,652	94%	1,100	50%	63%	70%	88	5%	8%	107	6%
2018	2,301	123	2,178	95%	1,643	75%	1,524	66%	70%	95%	40	2%	3%	535	25%

### Notes

- CATEGORY 1** represents estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries, purse seine trips undertaken completely outside the tropical waters (20°N-20°S). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the “Estimated” trips and so the values in this column will be an over-estimate of actual fishing trips.
- CATEGORY 2** represents trips of unknown status and is essentially the difference between VMS trips (**CATEGORY 1**) and those trips that SPC has a record of having taken place (**CATEGORY 3**). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the “Estimated” trips. This category may also include fishing trips without an observer on-board.
- CATEGORY 3** covers (i) data received at SPC and (ii) basic trip information provided by observer programmes indicating an observer trip took place, but data have yet to be provided.
- SPC employs a strategy of processing the most recent observer data as highest priority, mainly to ensure CCMs can satisfy their Part 1 and Part 2 reporting obligations (for which compliance applies to the most recent year). This is reflected in the “% of trips received without problems” in **CATEGORY 5** whereby the outstanding data entry for 2018/2019 has higher priority than outstanding trips data entry in 2016/2017, for example. Every effort has been made to resolve the backlog from previous years.
- CATEGORY 7** is essentially the difference between **CATEGORY 3** and **CATEGORY 4**.

6. Observer data from the Philippines fleet fishing in the High Seas Pocket #1 (HSP #1) are included in this table.



**Table 2. Summary of Purse seine Observer data received at SPC, by year and flag**

2015								
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed		
				Trips	%	Trips	% of Estimated trips	% of total available trips
China	42	14	28	27	96%	27	64%	100%
Ecuador	40	28	12	12	100%	10	25%	83%
European Union	24	14	10	10	100%	7	29%	70%
FSM	96	7	89	88	99%	86	90%	98%
Japan	264	135	129	119	92%	105	40%	88%
Kiribati	198	22	176	175	99%	167	84%	95%
Korea	291	60	231	231	100%	223	77%	97%
Marshall Is.	107	17	90	89	99%	87	81%	98%
New Zealand	23	20	3	3	100%	3	13%	100%
PNG	347	54	293	270	92%	260	75%	96%
Philippines	165	0	165	150	91%	147	89%	98%
Solomon Islands	60	20	40	39	98%	39	65%	100%
El Salvador	12	7	5	5	100%	4	33%	80%
Tuvalu	5	1	4	4	100%	4	80%	100%
Chinese Taipei	277	72	205	197	96%	187	68%	95%
USA	309	41	268	268	100%	264	85%	99%
Vanuatu	9	3	6	6	100%	6	67%	100%
	2260	512	1748	1687	97%	1620	72%	96%

2016								
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed		
				Trips	%	Trips	% of Estimated trips	% of total available trips
China	37	20	17	17	100%	15	41%	88%
Ecuador	29	26	3	3	100%	3	10%	100%
European Union	9	0	9	9	100%	8	89%	89%
FSM	129	11	118	113	96%	87	67%	77%
Japan	239	87	152	152	100%	145	61%	95%
Kiribati	221	38	183	175	96%	151	68%	86%
Korea	299	102	197	197	100%	192	64%	97%
Marshall Is.	85	1	84	80	95%	68	80%	85%
New Zealand	9	3	6	6	100%	6	67%	100%
PNG	347	25	322	315	98%	259	75%	82%
Philippines	175	0	175	174	99%	161	92%	93%
Solomon Islands	86	0	86	84	98%	69	80%	82%
El Salvador	14	11	3	3	100%	3	21%	100%
Tuvalu	7	0	7	7	100%	6	86%	86%
Chinese Taipei	255	38	217	217	100%	212	83%	98%
USA	248	31	217	217	100%	217	88%	100%
Vanuatu	6	0	6	6	100%	6	100%	100%
	2189	393	1796	1769	98%	1602	73%	91%

Table 2. Summary of Purse seine Observer data received at SPC, by year and flag (continued)

2017								
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed		
				Trips	%	Trips	% of total available trips	% of total trips recvd
China	18	16	2	2	100%	2	100%	100%
Ecuador	33	26	7	7	100%	7	100%	100%
European Union	24	13	11	11	100%	11	100%	100%
FSM	145	4	141	110	78%	47	33%	43%
Japan	217	88	129	129	100%	83	64%	64%
Kiribati	211	60	151	83	55%	68	45%	82%
Korea	262	78	184	162	88%	113	61%	70%
Marshall Is.	86	5	81	73	90%	54	67%	74%
New Zealand	12	7	5	5	100%	5	0%	100%
PNG	501	0	501	431	86%	242	48%	56%
Philippines	71	0	71	71	100%	59	83%	83%
Solomon Islands	103	0	103	92	89%	67	65%	73%
El Salvador	14	11	3	3	100%	3	100%	100%
Tuvalu	7	1	6	5	83%	4	67%	80%
Chinese Taipei	244	93	151	145	96%	134	89%	92%
USA	224	18	206	206	100%	155	75%	75%
Vanuatu	10	4	6	6	100%	6	60%	100%
	2172	420	1752	1535	88%	1054	60%	69%

2018								
FLEET	1. Estimated Purse seine TRIPS	2. TRIPS with unknown status	3. TRIPS with known placements	4. TRIP data submitted		5. TRIP data processed		
				Trips	%	Trips	% of total available trips	% of total trips recvd
China	27	4	23	19	83%	17	74%	89%
Ecuador	24	24						
European Union	15	5	10	10	100%	10	100%	100%
FSM	182	3	179	140	78%	132	74%	94%
Japan	230	32	198	176	89%	149	75%	85%
Kiribati	232	3	229	118	52%	112	49%	95%
Korea	285	2	283	180	64%	174	61%	97%
Marshall Is.	97	0	97	87	90%	83	86%	95%
Nauru	9	2	7	7	100%	7	100%	100%
New Zealand	7	4	3	3	100%	2	67%	67%
PNG	487	8	479	458	96%	411	86%	90%
Philippines	53	0	53	53	100%	52	98%	98%
Solomon Islands	103	14	89	80	90%	71	80%	89%
El Salvador	11	11						
Tuvalu	14	0	14	12	86%	12	86%	100%
Chinese Taipei	287	0	287	73	25%	65	23%	89%
USA	228	11	217	217	100%	217	100%	100%
Vanuatu	10	0	10	10	100%	10	100%	100%
	2301	123	2,178	1,643	75%	1,524	70%	93%

**Table 2. Summary of Purse seine Observer data received at SPC, by year and flag (continued)****Notes**

1. **CATGEORY 1** represents estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries, purse seine trips undertaken completely outside the tropical waters (20°N-20°S). ). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the “Estimated” trips.
2. **CATEGORY 2** represents trips of unknown status and is essentially the difference between VMS trips (**CATEGORY 1**) and those trips that SPC has a record of having taken place (**CATGEORY 3**). In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the “Estimated” trips. This category may also include fishing trips without an observer on-board.
3. **CATEGORY 3** covers (i) data received at SPC and (ii) basic trip information provided by observer programmes indicating an observer trip took place, but data have yet to be provided.
4. Observer data from the Philippines fleet fishing in the High Seas Pocket #1 (HSP #1) are included in this table.

**Table 3. Provisional 2017 Longline Regional Observer Programme (ROP) coverage by CCM – based on reporting from CCMs and data submissions**

The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting is from Annual Report Part 1.

REGIONAL OBSERVER PROGRAMME (ROP) DATA COVERAGE (minimum required for ROP is 5%)									
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	As reported by flag state		Total estimated effort	As per data submission		See NOTES
				Observer	%		Observer	%	
AUSTRALIA	Domestic	No. of Hooks	–	–	–	–	–	–	2, 17
CHINA	Ice/Fresh	Days at Sea	65,825	2,693	4.1%	65,825	2,693	4.1%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	3,368	256	7.6%	4,595	291	6.3%	8, 9
EUROPEAN UNION	Distant-water	No. of Trips	3	1	33.3%	3	1	33.3%	4, 10, 19
FSM	Pacific Islands	No. of Trips	253	1	0.4%	220	2	0.9%	7
FIJI	Pacific Islands	No. of Trips	686	205	29.9%	84	7	8.3%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	24,298	919	3.8%	24,298	907	3.7%	10
	Frozen, long-trip	Days fished	8,371	669	8.0%	8,371	588	7.0%	10
KIRIBATI	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
MARSHALL ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 25
NEW CALEDONIA	Pacific Islands	No. of Hooks	–	–	–	–	–	–	2
NEW ZEALAND	Domestic	No. of Hooks	–	–	–	–	–	–	2
PALAU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PHILIPPINES	Distant-water	No. of Trips	–	–	–	–	–	–	1, 16
REPUBLIC OF KOREA	Distant-water	Days fished	16,777	694	4.1%	16,664	789	4.7%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
SOLOMON ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 24
TONGA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
TUVALU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 12
CHINESE TAIPEI	Small longline – STLL	Days at Sea	111,240	6,414	5.8%	111,240	8,856	8.0%	10, 14
	Distant-water – DWLL	Days at Sea	20,915	2,112	10.1%	20,915	2,964	14.2%	10
USA	HAWAII/California-based	No. of Trips	985	235	23.9%	985	235	23.9%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Island-based, short trip	Days at Sea	9,412	219	2.3%	9,412	45	0.5%	9, 10, 11
	Distant-water								

## NOTES

1. The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting includes information from Annual Reports - Part 1.
2. Domestic fleet fishing within their EEZ. There is no fishing in other EEZs but there may be very infrequent activities in adjacent high seas area. The activities of this fleet are therefore not relevant to the requirements for ROP longline coverage.
3. China has advised in their Annual Report Part 1 that their choice of metric is “days-at-sea”. Total estimated effort (of days at sea) is determined from available operational logbook data, raised to account for incomplete coverage (of operational logbook data provided).
4. In a communication of 28 February 2015, EU advised that they will use “NUMBER OF TRIPS” for measuring and reporting observer coverage on its flagged LL vessels for years from 2014. For 2013, they had previously advised that “*We are currently exploring options for improving observer coverage on EU LLs. Recent amendments in the ES legislation should contribute also in improving these aspects. At TCC10, EU advised that legislation has been adopted.*”
5. No information provided by the CCM for this fleet.
6. The information provided for the US fleets EXCLUDES activities in their respective EEZs, that is, the coverage rates provided are for their ROP trips only and estimated effort is for activities outside their EEZ.
7. The information provided for these fleets EXCLUDES activities of the domestic component (i.e. vessels fishing exclusively in the home EEZ and adjacent high seas only); the coverage represents the component that conduct ROP-defined trips only.
8. Most (if not all) vessel trips (and therefore most days-at-sea) would be non-ROP trips since mostly restricted to waters of national jurisdiction. . Observer coverage is for all activities (ROP and non-ROP) of the domestic fleet.
9. Observer trip value represents the trip data provided to SPC in the absence of advice from this CCM on total number of observer trips conducted. This value may not represent the overall trips undertaken (i.e. it may be an under-estimate).
10. All vessel trips (and therefore days-at-sea) would be defined as ROP trips. “Distant-water” vessels have very long trips and since some fleets tranship at sea, the unit of coverage might more suitably be “days-at-sea” for these situations.
11. Covers both ‘fleets’ as coverage cannot be split by fleet at this stage.
12. Tuvalu advised their choice of metric was “Number of Trips”.
13. Observer coverage information (as nominated from flag state) was taken from the CCMs WCPFC Annual Report Part 1 prepared for SC14 (as per WCPFC11 Summary Report paragraphs 483 – 486).
14. Includes observer trips conducted by Coastal state observer programmes on Chinese Taipei-flagged STLL vessels.
15. This CCM did not have flagged longline vessels on the Record of Fishing Vessels in 2017.
16. No longline vessels from Philippines active in 2017.
17. Australia commenced producing data from their E-Monitoring system from 2015. E-Monitoring data are not yet considered to count towards ROP coverage.
18. Japan provided trip-level details for 2017 observer activities including trip monitoring information. However, data at the set level have yet to be provided.
19. Observer data provided does not satisfy all of the ROP minimum data field standards.
20. There is evidence that additional observer trips have been conducted by coastal states, but the data have yet to be provided.
21. The number of total trips for the Indonesian domestic longline fleet is not known but has been estimated based on the annual catch estimate and approximate catch per trip.
22. 2017 observer data provided for the China longline fleet included some activity in the Pacific Ocean beyond the WCPFC Area; these data have been excluded in the coverage rates presented in this table.
23. Effort metric for Korean longline fleet in 2017 is DAYS FISHED.
24. No activity in 2017 by this CCMs longline fleet.

**Table 4. Provisional 2018 Longline Regional Observer Programme (ROP) coverage by CCM – based on reporting from CCMs and data submissions**

The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting is from Annual Report Part 1.

			REGIONAL OBSERVER PROGRAMME (ROP) DATA COVERAGE						
			(minimum required for ROP is 5%)						
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	As reported by flag state		Total estimated effort	As per data submission		See NOTES
				Observer	%		Observer	%	
AUSTRALIA	Domestic	No. of Hooks	–	–	–	–	–	–	2, 17
CHINA	Ice/Fresh	Days at Sea	61,316	3,323	5.4%	60,756	3,671	6.0%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	3,252	348	10.7%	3,408	278	8.2%	8, 9
EUROPEAN UNION	Distant-water	No. of Trips	13	1	7.7%	13	1	7.7%	4, 10, 19
FSM	Pacific Islands	No. of Trips	228	15	6.6%	220	15	6.8%	7
FIJI	Pacific Islands	No. of Trips	661	233	35.2%	74	10	13.5%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea	–	–	–	–	–	–	2
INDONESIA	Domestic	No. of Trips	–	–	–	–	–	–	2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	25,626	938	3.7%	25,626	938	3.7%	10
	Frozen, long-trip	Days fished	8,911	614	6.9%	8,911	614	6.9%	10
KIRIBATI	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
MARSHALL ISLANDS	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 25
NEW CALEDONIA	Pacific Islands	No. of Hooks	–	–	–	–	–	–	2
NEW ZEALAND	Domestic	No. of Hooks	–	–	–	–	–	–	2
PALAU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
PHILIPPINES	Distant-water	No. of Trips	–	–	–	–	–	–	1, 16
REPUBLIC OF KOREA	Distant-water	Days at Sea	26,717	1,695	6.3%	26,717	1,695	6.3%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
SOLOMON ISLANDS	Pacific Islands	No. of Trips	447	17	3.8%	17	1	5.9%	7, 9
TONGA	Pacific Islands	No. of Trips	–	–	–	–	–	–	2
TUVALU	Pacific Islands	No. of Trips	–	–	–	–	–	–	2, 12
CHINESE TAIPEI	Small longline – STLL	Days at Sea	108,883	8,950	8.2%	108,883	8,404	7.7%	10, 14
	Distant-water – DWLL	Days at Sea	20,820	1,793	8.6%	20,820	1,353	6.5%	10
USA	HAWAII/California-based	No. of Trips	1,108	254	22.9%	1,108	254	22.9%	6
	AMERICAN SAMOA	No. of Trips	–	–	–	–	–	–	2, 6
VANUATU	Pacific Island-based, short trip	Days at Sea	15,419	275	1.8%	14,986	990	6.6%	9, 10, 11
	Distant-water								

## NOTES

1. The fleet breakdown, metric and reporting by CCMs is based on WCPFC11 Summary Report para 483-486 and Attachment L (Anon., 2010a). Flag CCM reporting includes information from Annual Reports - Part 1.
2. Domestic fleet fishing within their EEZ. There is no fishing in other EEZs but there may be very infrequent activities in adjacent high seas area. The activities of this fleet are therefore not relevant to the requirements for ROP longline coverage.
3. China has advised in their Annual Report Part 1 that their choice of metric is “days-at-sea”. Total estimated effort (of days at sea) is determined from available operational logbook data, raised to account for incomplete coverage (of operational logbook data provided).
4. In a communication of 28 February 2015, EU advised that they will use “NUMBER OF TRIPS” for measuring and reporting observer coverage on its flagged LL vessels for years from 2014. For 2013, they had previously advised that “*We are currently exploring options for improving observer coverage on EU LLs. Recent amendments in the ES legislation should contribute also in improving these aspects. At TCC10, EU advised that legislation has been adopted.*”
5. No information provided by the CCM for this fleet.
6. The information provided for the US fleets EXCLUDES activities in their respective EEZs, that is, the coverage rates provided are for their ROP trips only and estimated effort is for activities outside their EEZ.
7. The information provided for these fleets EXCLUDES activities of the domestic component (i.e. vessels fishing exclusively in the home EEZ and adjacent high seas only); the coverage represents the component that conduct ROP-defined trips only.
8. Most (if not all) vessel trips (and therefore most days-at-sea) would be non-ROP trips since mostly restricted to waters of national jurisdiction. . Observer coverage is for all activities (ROP and non-ROP) of the domestic fleet.
9. Observer trip value represents the trip data provided to SPC in the absence of advice from this CCM on total number of observer trips conducted. This value may not represent the overall trips undertaken (i.e. it may be an under-estimate).
10. All vessel trips (and therefore days-at-sea) would be defined as ROP trips. “Distant-water” vessels have very long trips and since some fleets tranship at sea, the unit of coverage might more suitably be “days-at-sea” for these situations.
11. Covers both ‘fleets’ as coverage cannot be split by fleet at this stage.
12. Tuvalu advised their choice of metric was “Number of Trips”.
13. Observer coverage information (as nominated from flag state) was taken from the CCMs WCPFC Annual Report Part 1 prepared for SC14 (as per WCPFC11 Summary Report paragraphs 483 – 486).
14. Includes observer trips conducted by Coastal state observer programmes on Chinese Taipei-flagged STLL vessels.
15. This CCM did not have flagged longline vessels on the Record of Fishing Vessels in 2018.
16. No longline vessels from Philippines active in 2018.
17. Australia commenced producing data from their E-Monitoring system from 2015. E-Monitoring data are not yet considered to count towards ROP coverage.
18. Japan provided trip-level details for 2018 observer activities including trip monitoring information. However, data at the set level have yet to be provided.
19. Observer data provided does not satisfy all of the ROP minimum data field standards.
20. There is evidence that additional observer trips have been conducted by coastal states, but the data have yet to be provided.
21. The number of total trips for the Indonesian domestic longline fleet is not known but has been estimated based on the annual catch estimate and approximate catch per trip.
22. 2018 observer data provided for the China longline fleet included some activity in the Pacific Ocean beyond the WCPFC Area; these data have been excluded in the coverage rates presented in this table.
23. Effort metric for Korean longline fleet in 2018 is DAYS FISHED.
24. No activity in 2018 by this CCM’s longline fleet.
25. Represents the chartered vessels in this fleet; no vessels were flagged to RMI in 2018.

**Table 5. Coverage of Longline Observer data in the WCFPC Area, for 2017**

(all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data)

CCM Fleet	Hooks		
	Total Effort	Observer	
AUSTRALIA	8,668,853	0	
CHINA	137,370,836	5,527,363	
COOK ISLANDS	14,623,763	774,354	
EUROPEAN UNION	740,177	67,100	
FSM	53,511,680	37,536	
FIJI	16,012,525	3,861,024	
FRENCH POLYNESIA	19,884,569	765,809	
INDONESIA	21,291,013	0	
JAPAN	119,344,670	3,365,336	
KIRIBATI	4,866,947	0	
MARSHALL ISLANDS	13,996,662	566,168	
NEW CALEDONIA	5,259,007	386,125	
NEW ZEALAND	2,204,482	331,035	
PALAU	737,148	6,102	
PAPUA NEW GUINEA	4,241,470	0	
REPUBLIC OF KOREA	48,267,371	1,848,638	
SAMOA	11,698,153	199,546	
SOLOMON ISLANDS	1,966,952	0	
TONGA	1,629,118	53,282	
TUVALU	2,009,490	124,498	
CHINESE TAIPEI	215,106,913	10,616,046	
USA	54,699,198	12,575,118	
VANUATU	35,094,026	158,655	
<b>Total</b>	<b>793,225,023</b>	<b>41,263,735</b>	<b>5.2%</b>

**Notes**

1. Total effort (hooks) for Indonesia has been estimated.
2. CCM Fleet includes chartered vessels.



**Table 6. Coverage of Longline Observer data in the WCFPC Area, for 2018**

(all observer data available to the WCPFC Science Service Provider; includes both ROP and non-ROP data)

CCM Fleet	Hooks		
	Total Effort	Observer	
AUSTRALIA	7,879,747	0	
CHINA	145,815,673	6,151,710	
COOK ISLANDS	8,610,556	588,743	
EUROPEAN UNION	945,729	146,836	
FSM	53,814,981	579,906	
FIJI	17,281,966	5,803,940	
FRENCH POLYNESIA	34,366,369	478,055	
INDONESIA	116,718,714	0	
JAPAN	115,755,654	2,928,758	
KIRIBATI	4,572,721	29,550	
MARSHALL ISLANDS	10,441,082	371,584	
NEW CALEDONIA	5,405,486	542,643	
NEW ZEALAND	2,234,649	293,138	
PALAU	8,900,155	0	
PAPUA NEW GUINEA	6,341,889	0	
REPUBLIC OF KOREA	58,283,382	1,653,142	
SAMOA	8,524,898	0	
SOLOMON ISLANDS	29,923,241	928,421	
TONGA	1,225,312	29,320	
TUVALU	1,345,984	89,394	
CHINESE TAIPEI	170,812,723	10,420,531	
USA	57,360,487	12,727,784	
VANUATU	35,967,186	1,375,844	
<b>Total</b>	<b>902,528,584</b>	<b>45,139,299</b>	<b>5.0%</b>

**Notes**

1. Total effort (hooks) for Indonesia has been estimated.
2. CCM Fleet includes chartered vessels.

**Table 7. Contribution of Pacific Islands' observer programmes to observer coverage, by gear, for 2017 (top) and 2018 (bottom)**

2017				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% <sup>1</sup>	Trips	Cov% <sup>2</sup>
COOK ISLANDS	10	1.0%	5	0.06%
FEDERATED STATES OF MICRONESIA	31	1.1%	0	0.00%
FIJI	0	0.0%	172	0.46%
FRENCH POLYNESIA	0	0.0%	43	0.10%
KIRIBATI	115	6.1%	5	0.01%
MARSHALL ISLANDS	40	1.9%	39	0.08%
NAURU	18	1.0%	0	0.00%
NEW CALEDONIA	0	0.0%	24	0.08%
PALAU	0	0.0%	1	0.00%
PAPUA NEW GUINEA	426	17.7%	2	0.01%
PHILIPPINES	43	1.1%	0	0.00%
PNA Observer Programme	603	27.5%	0	0.00%
SOLOMON ISLANDS	122	4.6%	3	0.05%
TONGA, KINGDOM OF	0	0.0%	30	0.19%
TUVALU	145	9.2%	0	0.00%
US MLT Observer Programme	206	11.6%	0	0.00%
VANUATU	0	0.0%	1	0.00%
<b>Total</b>	<b>1759</b>	<b>82.7%</b>	<b>325</b>	<b>1.05%</b>

2018				
Observer Provider/Programme	PURSE SEINE		LONGLINE	
	Trips	Cov% <sup>1</sup>	Trips	Cov% <sup>2</sup>
COOK ISLANDS	10	0.8%	9	0.04%
FEDERATED STATES OF MICRONESIA	22	0.9%	2	0.02%
FIJI	1	0.0%	231	0.56%
FRENCH POLYNESIA	0	0.0%	25	0.05%
KIRIBATI	15	0.5%	1	0.00%
MARSHALL ISLANDS	25	1.1%	34	0.07%
NAURU	6	0.3%	0	0.00%
NEW CALEDONIA	0	0.0%	29	0.08%
PALAU	0	0.0%	0	0.00%
PAPUA NEW GUINEA	331	12.4%	2	0.00%
PHILIPPINES	38	0.9%	0	0.00%
PNA Observer Programme	639	27.2%	0	0.00%
SOLOMON ISLANDS	135	5.1%	14	0.13%
TONGA, KINGDOM OF	0	0.0%	16	0.09%
TUVALU	137	7.5%	0	0.00%
US MLT Observer Programme	212	11.0%	0	0.00%
VANUATU	0	0.0%	6	0.04%
<b>Total</b>	<b>1571</b>	<b>67.7%</b>	<b>369</b>	<b>1.08%</b>

**Notes**

1. Cov% represents coverage in the tropical WCPFC purse seine fishery using total target tuna catch estimate as the metric.
2. Cov% represents coverage in the WCPFC longline fishery using total target tuna catch estimate as the metric.
3. Trips represent observer trips conducted by the observer programme. This metric is not used in the estimate of coverage (see notes 1. and 2. above).
4. Represents data received at SPC, including some data not yet to be processed.

**Table 8. Coverage of Longline E-Monitoring data, by CCM Fleet, for 2017 (top) and 2018 (bottom)**

				E-MONITORING DATA COVERAGE	
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	EM Analyst	%
AUSTRALIA	Domestic	Sets	5,234	528	10.1%
CHINA	Ice/Fresh	No. of Trips	971	18	1.9%
FSM	Pacific Islands	No. of Trips	220	4	1.8%
FIJI	Pacific Islands	No. of Trips	923	181	19.6%
JAPAN	Ice/Fresh, short-trip	No. of Trips	799	4	0.5%
MARSHALL ISLANDS	Pacific Islands	No. of Trips	309	62	20.1%
PALAU	Pacific Islands	No. of Trips	70	17	24.3%
SOLOMON ISLANDS	Pacific Islands	No. of Trips	-	0	

				E-MONITORING DATA COVERAGE	
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	EM Analyst	%
AUSTRALIA	Domestic	Sets	4,502	489	10.9%
CHINA	Ice/Fresh	No. of Trips	976	0	0.0%
FSM	Pacific Islands	No. of Trips	315	1	0.3%
FIJI	Pacific Islands	No. of Trips	862	91	10.6%
JAPAN	Ice/Fresh, short-trip	No. of Trips	714	0	0.0%
MARSHALL ISLANDS	Pacific Islands	No. of Trips	392	39	9.9%
PALAU	Pacific Islands	No. of Trips	298	6	2.0%
SOLOMON ISLANDS	Pacific Islands	No. of Trips	-	0	

**Notes**

1. Total estimated effort covers all effort (i.e. both ROP and non-ROP trips) and so may differ to Tables 3 and 4 for some fleets.
2. CCM Fleet includes chartered vessels.

