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A brief update on ER and EM progress in the region

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1. Introduction

This information paper provides a very brief summary of Electronic Reporting (ER) and Electronic Monitoring (EM) projects currently being implemented in the WCPO oceanic fisheries. ER and EM data flow are presented. Some of the EM challenges are described. An example of comparative analysis is provided. An outlook on using LL EM data towards WCPFC ROP coverage and drafting EM Purse Seine process standards is provided.

Readers are also directed to a recent article by Mr Francisco Blaha on E-Reporting in Pacific Ocean fisheries at http://www.franciscoblaha.info/blog/2017/7/20/the-epacific-apps-for-fisheries-data-acquisition-in-the-pacific.

2. Summary of regional ER and EM projects and coordination resources

Country	EM	Description	ER	Description	Coordination
Australia	Yes	EM programme implemented on 75 vessels (three types of gear)	Yes	Two private e-log software certified by AFMA are available for use by vessel operators	Dedicated staff
New Zealand	Yes	Integrated ER and EM programme to be implemented in 2018	Yes	Integrated ER and EM programme to be implemented in 2018	Dedicated staff
Papua New Guinea	No	EM programme to be implemented in 2018	Yes	*iFIMS e-obs* for fisheries observers and *iFIMS e-logs* for PS and LL vessels	Two dedicated staff
New Caledonia	No	EM trial in 2015-2016	Yes	Two longline vessels using *eTUNALOG*. One longline vessel using *OnBoard*	Observer coordinator and SPC Regional ER and EM co-coordinator
Solomon Islands	No	EM trial in 2014, EM trial in 2015-2016, six longline vessels pending EMS installation in Q3 2017	Yes	*iFIMS e-obs* for fisheries observers and iFIMS e-logs for PS and LL fishers	ER and EM coordinator in post since April 2016 and SPC Regional ER and EM coordinator
Vanuatu	No		Yes	Two longline vessels using *OnBoard.* TAILS application used for monitoring artisanal fisheries	One dedicated staff
Fiji	Yes	17 longline vessels currently equipped, 50 vessels to be equipped by 2018	Yes	Three longline vessels using *eTUNALOG* and one longline vessel using *OnBoard*	One dedicated staff
Tonga	No		Yes	Three longline vessels using *eTUNALOG* and one longline vessel using *OnBoard*	One dedicated staff

Country	EM	Description	ER	Description	Coordination
Niue	No		Yes	*TAILS* application used for monitoring artisanal fisheries	
Samoa	No		Yes	Three longline vessels using *eTUNALOG*. One vessel using *OnBoard*	Observer coordinator and SPC Regional ER and EM coordinator
American Samoa	No		No		?
Cook Islands	Yes	Two PS vessels equipped with EM	Yes	One longline vessels using *OnBoard*, three longline vessels using *eTUNALOG*	One dedicated staff and SPC Regional ER and EM coordinator
Tokelau	No		Yes	*TAILS* application used for monitoring artisanal fisheries, i*FIMS e-obs* for fisheries observers and *iFIMS e-logs* for PS and LL fishers	
Tuvalu	No		Yes	TAILS application used for monitoring artisanal fisheries, *iFIMS e-obs* for fisheries observers and *iFIMS e-logs* for PS and LL fishers	
Kiribati	No		Yes	1 Longline vessel using *eTUNALOG*	
Nauru	No		Yes	TAILS application used for monitoring artisanal fisheries	
FSM	Yes	Five longline vessels equipped with EM	Yes	*FIMS e-obs* for fisheries observers and *iFIMS e-logs* for PS and LL fishers	ER and EM coordinator recruited in Q2 2017, Regional ER and EM coordinator
RMI	Yes	Six longline vessels equipped with EM	Yes	*iFIMS e-obs* for fisheries observers and *iFIMS e-logs* for PS and LL fishers	ER and EM coordinator in post since September 2015 and SPC Regional ER and EM coordinator
Palau	Yes	Seven longline vessels equipped with EM	No		One dedicated staff
FP	No		Yes	Four longline vessels using *OnBoard*	Two dedicated staff

3. E-Reporting

3.1 Vessel Logsheet E-Reporting (e-logs)

3.1.1 Purse Seine vessels

The Parties to the Narau Agreement (PNA) in collaboration with member countries and purse seine vessel owners continues to implement the *integrated Fisheries Information Management System (iFIMS). iFIMS* includes an Android application ***(eForms)*** which allows purse seine vessels operators to report their effort and catch data electronically on a daily basis. A total of 250 purse seine vessels are currently using the *iFIMS* E-Reporting system. E-logs are securely lodged to the PNAO's *iFIMS* database system and are then forwarded to SPC's TUFMAN2 database system. These vessels continue to also report their effort and catch data using the SPC/FFA Regional Purse Seine Logsheet paper form.

31.2 Longline vessels

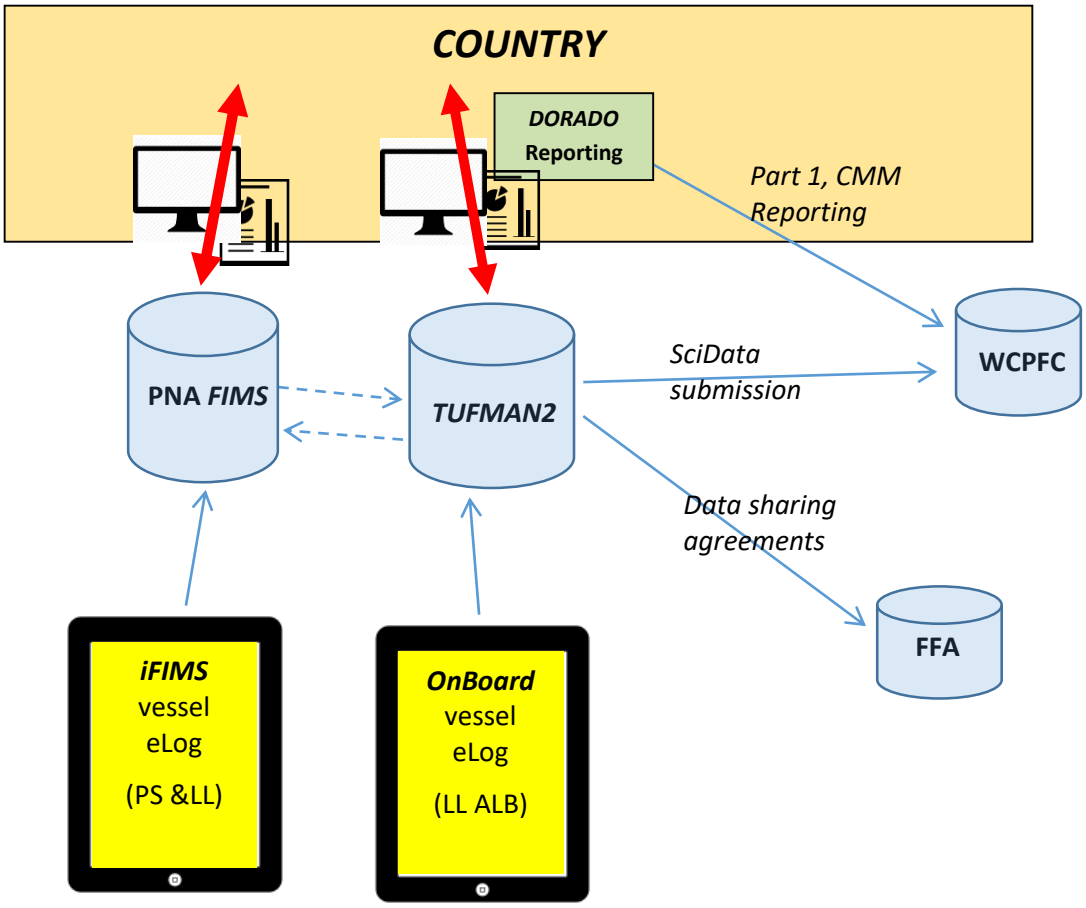
iFIMS includes an Android application ***(eForms)*** which allows longline vessel operators to report their effort and catch data electronically on a daily basis. Approximately 150 longline vessels are currently using the *iFIMS* E-Reporting system. E-logs are securely lodged to the PNAO's *iFIMS* database system and are then forwarded to SPC's TUFMAN2 database system. These vessels continue to also report their effort and catch data using the SPC/FFA Regional Longline Logsheet paper form.

The Pacific Community (SPC) in collaboration with member countries and longline vessel owners in the South Pacific Albacore fishery have started to implement the Android application ***(OnBoard)***. This application allows longline vessel operators to report their effort and catch data at any time when internet connectivity is available (either on-board the vessel or on shore). Currently seven SPC member countries and eleven longline vessels are using *OnBoard*. The e-logs are securely lodged to the TUFMAN2 database system where they can be verified and validated by the respective member countries' fisheries authorities.

A few longline vessels continue to use the PC application *eTUNALOG*. Although the *OnBoard* application will gradually replace *eTUNALOG.*

3.1.3 E-Logs data flow

The diagram below illustrates the current and proposed data flow for e-logs (from *OnBoard and iFIMS).* The dotted arrows represent data flow processes that have yet to be fully implemented.

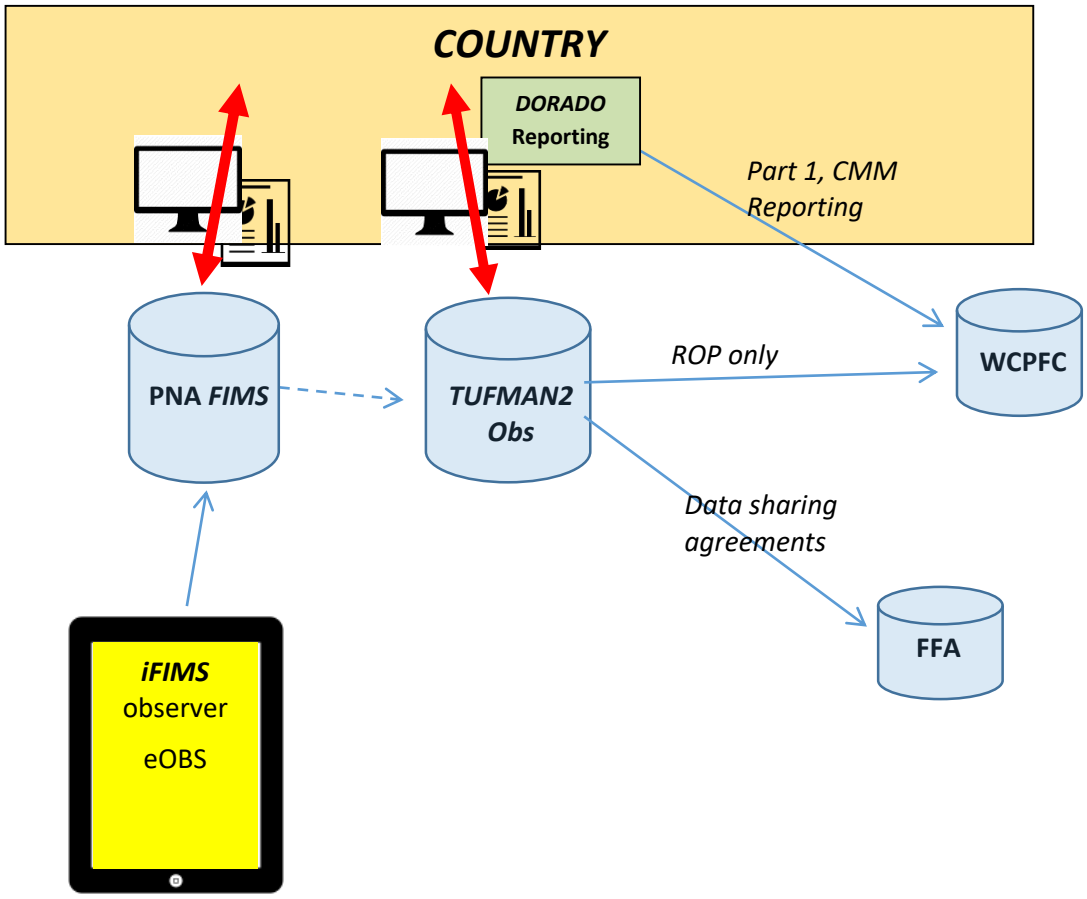


3.2 Observer E-Reporting (eObs)

The i*FIMS* system includes an Android application **(eObs)** which allows Pacific Islands Fisheries Observers to report and transmit their observations while at sea and upon return to port. The data are lodged to PNAO's *FIMS* database and are then forwarded to SPC's TUBS database. Fisheries observers are still required to complete their SPC/FFA Regional Purse Seine Fisheries Observer Workbook (paper).

3.2.1 E-obs data flow

The diagram below illustrates the current and proposed observer electronic data flow (from *iFIMS eObs).* The dotted arrows represent data flow processes that have yet to be fully implemented.



4. E-Monitoring

4.1 Regional update on number of vessels equipped with EMS and number of EM analysts trained and working

The table below summarises the number of vessels per country equipped with an E-Monitoring System, the number of EM analysts trained, working and the number of review computers available.

Country	Number of vessels equipped with EMS	Vessel gear	Number of EM analysts trained	Number of EM analysts working	Number of review stations
Palau	7[1]	LL	4	2	2
FSM	5	LL	5	1[2]	2
RMI	6	LL	6	2[3]	2
Fiji	17	LL	33	8[4]	8
Cook Islands	2	PS	2	1	1

[1] Four Koror based vessels + 3 Okinawa based vessels

[2] One permanent EM analyst. Other EM analysts working when available

[3] Rotation system with two analysts working at the same time

[4] Rotation system

4.2 EM Challenges

4.2.1 EM - Longline vessels

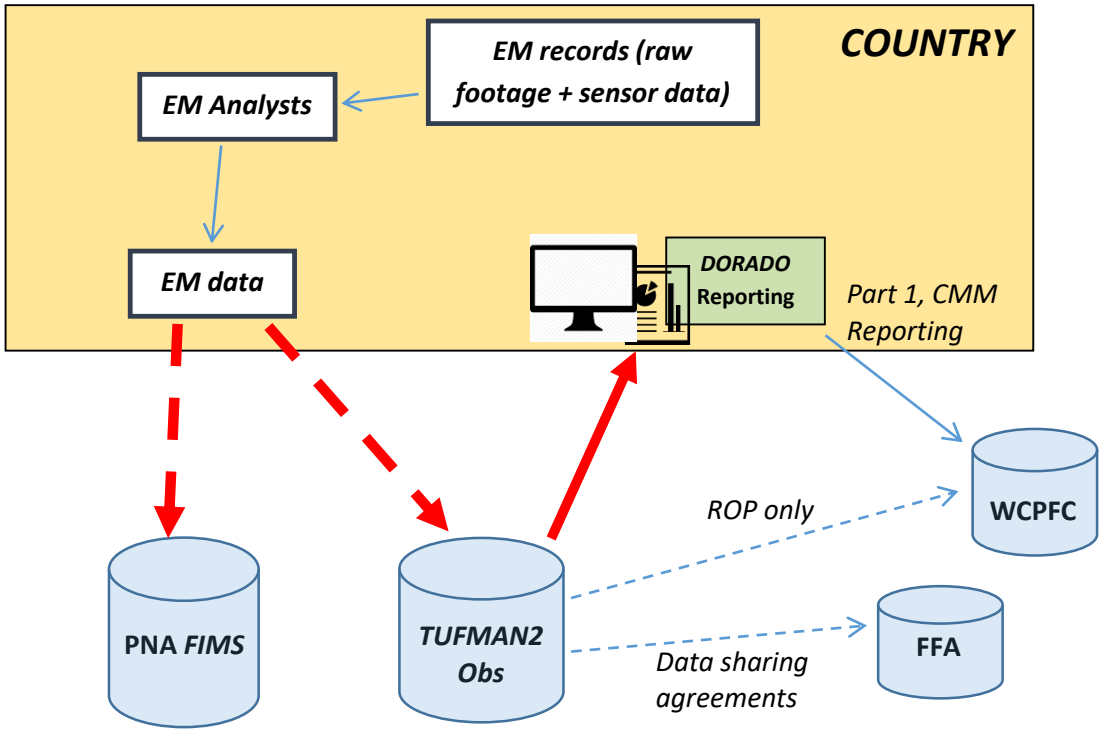
The analysis of EM records is a challenge in some countries where EM analysts' resources can be limited and vessel landing port may be different to the place of EM records analysis. Analysis of EM records can also be a challenge depending on the quality of the raw footage (due to irregular camera housing cleaning). Minor on-board E-Monitoring equipment issues have been reported and addressed by in country staff and the EM service provider.

4.2.2 EM- Purse seine vessels

An initial review of the EM system installed on the two purse seine vessels operating in the Cook Islands EEZ and the method used to analyse the EM records shows that it is not best suited to produce high quality scientific data. However avenues for enhancing the EMS and review methodology exist to allow producing useful scientific data (see also WCPFC-SC-2017/ST-WP-02).

4.3 EM Data flow

The diagram below illustrates the current and proposed E-Monitoring data flow. Dotted arrows represent data flow processes that need to be completed/confirmed.

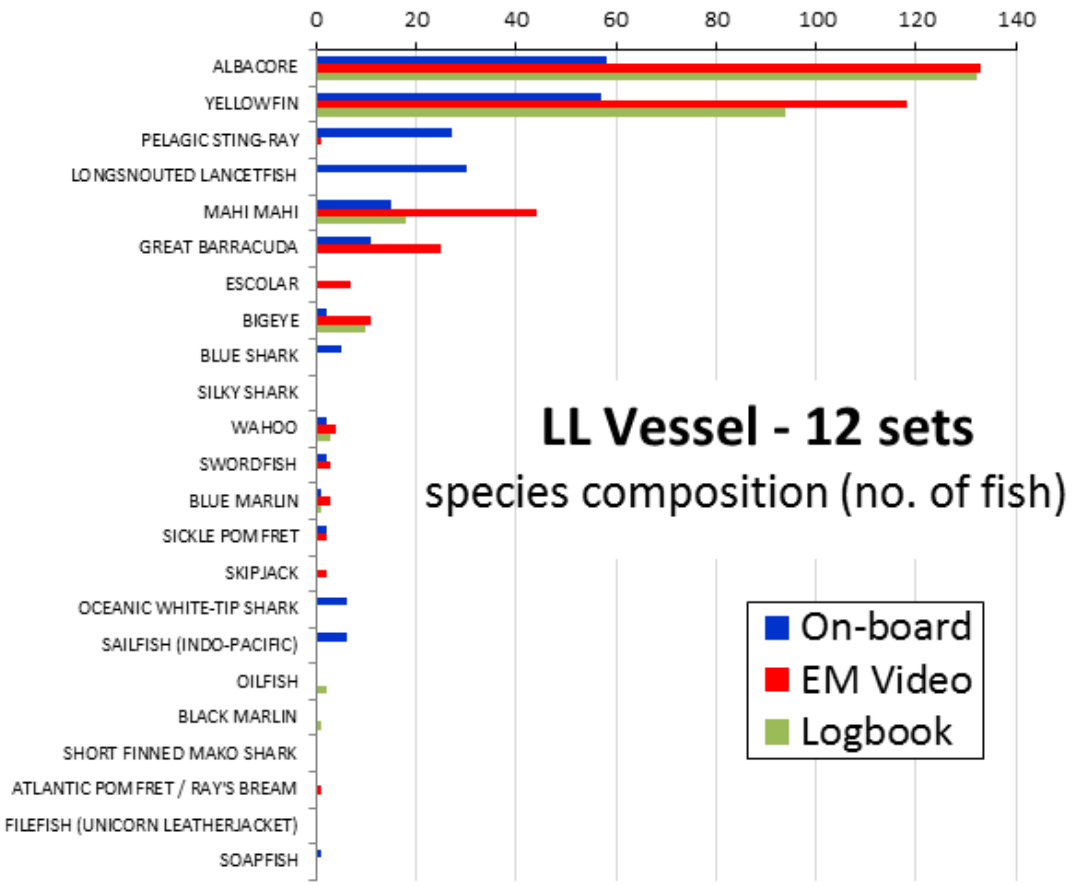


Note that consultations with countries and the PNAO are ongoing in regards to being able to lodge EM data to the PNA iFIMS database.

4.4 Comparative analyses (Observer/EM/logsheet)

Comparative analyses between observer data, EM data and logsheet data (paper or elog) are being generated. An example is provided below. Such comparative analyses can be useful for fisheries managers to address issues such as under or miss reporting of logsheet data. These analyses are also a useful instrument to determine the effectiveness and limitations of an EM system. In the example below the observer reported less number of Albacore and Yellowfin tuna than the EM analyst and the vessel. This can be explained by the fact that observers sometimes cannot observe the totality of the hauling operations throughout the trip as they may be resting, ill or feel it is unsafe to be out on deck during adverse weather. This comparison with EM data shows one benefit of EM. On the contrary, the observer reported more pelagic sting rays and blue sharks than did the EM analysts. This can be explained by the fact that such species are generally struck off the hook by the crew firmly jerking on the branch line or even cutting it for sharks. In such cases, the observer may have a better angle of view than the EM analyst.

The graph below represents the number of species caught (retained or discarded) by a longline vessel having completed 12 sets. The blue bars represent the on-board observer data, the red bars represent the EM data generated by EM analysts and the green bars represent the logsheet data submitted by the vessel operator.



345 EM data and WCPFC ROP LL coverage

A reflection involving member countries, regional organisations and the WCPFC is needed to determine how EM data could contribute towards the WCPFC's ROP longline coverage. Countries are encouraged to place observers on-board vessels equipped with EMS as this will allow gathering two types of data which can be compared and will provide elements to guide this reflection. Additionally, systems and processes to ensure the data fields which EM systems cannot record are reported as required need to be developed. It is intended that some initial discussions on this topic will be discussed at the workshop in Section 4.7 below.

4.6 Standards for ER and EM data fields

The Thirteenth Regular Session of the Commission (WCPFC13) adopted the WCPFC E-Reporting logbook data standards[1] and the draft the WCPFC E-Reporting observer data standards[2] were significantly progressed in WCPFC meetings during 2016 with an expectation they will be adopted by the end of 2017. These standards will provide a more efficient mechanism for data generated from E-Reporting and E-Monitoring systems to flow into the WCPFC, member countries and other regional agencies. Work on establishing a metadata database to store the information and structure contained in the WCPFC ER standards begun in June 2017. This database and the development of a tool to review the information from this database, will make it easier for users to view the comprehensive information available in these standards.

4.7 LL and PS EM technical process standards workshop

SPC and FFA in collaboration with its member countries and the PNAO and EM service providers plan to hold a workshop in Noumea in November 2017 aimed at revising the existing draft EM process standards for longline vessels, and drafting new EM process standards for purse seine vessels.

5. Acknowledgements

Members, regional and sub-regional agencies across the WCPO have played a proactive role in developing ER and EM systems and processes to date. We would like to acknowledge the funding of the International Seafood Sustainability Foundation (ISSF), The Nature Conservancy (TNC) and the Pew Foundation for its ongoing support of this work throughout the region.

[1] See https://www.wcpfc.int/doc/data-05/standards-specifications-and-procedures-electronic-reporting-wcpfc-operational-catch-and

[2] See ATTACHMENT 5 in https://www.wcpfc.int/system/files/Summary%20Report%20for%20ERandEMWG2_complete.pdf