NOAA FISHERIES

Pacific Islands Region Electronic Technologies Implementation Plan

AUGUST 2021

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Acronyms	
CNMI Commissions	Commonwealth of the Northern Mariana Islands State Marine Fisheries Commissions
Council/Councils	Western Pacific Fishery Management Council/Regional Fishery Management Councils
EEZ	Exclusive Economic Zone
EM	Electronic monitoring
ER	Electronic reporting
ESA	Endangered Species Act
ET	Electronic technologies
FEP	Fishery Ecosystem Plan
FIS	Fisheries Information Systems Program
HDAR	Hawaii Division of Aquatic Resources
HLA	Hawaii Longline Association
HMS	Highly Migratory Species
IATTC	Inter-American Tropical Tuna Commission
MHI	Main Hawaiian Islands
ML	Machine learning
MMPA	Marine Mammal Protection Act
MRIP	Marine Recreational Information Program
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MUS	Management Unit Species
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OLE	NOAA Office of Law Enforcement

Acronyms	
ORCA	Onboard Record Collection Application
PacFIN	Pacific Fisheries Information Network
PID	Pacific Islands Division (NOAA Office of Law Enforcement)
PIFSC	Pacific Islands Fisheries Science Center
PIR	Pacific Islands Region
PIRO	Pacific Islands Regional Office
PIROP	Pacific Islands Region Observer Program
PWA	Progressive web application
SPTT	South Pacific Tuna Treaty
VIAME	Video and Image Analytics for Marine Environments
VMS	Vessel monitoring system
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean
WCROP	West Coast Region Observer Program

1 Executive Summary

The Pacific Islands Region is committed to the use of electronic technologies in fishery-dependent data collection to collect timely, cost-efficient data needed to manage U.S. federal fisheries. Electronic technologies in 2021 include the use of vessel monitoring systems (VMS) on all permitted longline vessels in Hawaii and American Samoa, electronic reporting (ER) on 105 of 145 volunteer longline vessels, electronic monitoring (EM) on 20 volunteer longline vessels, and other ER and EM technologies. The demands for more precise, timelier, and more comprehensive fishery-dependent data continue to rise. Constrained budgets and increasing demands for data are driving the need to evaluate and improve existing fishery dependent data collection programs.

The following describes the Pacific Islands regional priorities for 2021-2025:

1. Implement mandatory ER in the Hawaii and American Samoa longline fisheries. Mandatory ER will allow for near real-time data submissions to increase reporting accuracy, reduce data processing time, and more rigorously monitor and forecast the attainment of international longline catch quotas such as bigeye tuna catch limit under the Western and Central Pacific Fisheries Commission (WCPFC) Convention Area and in the Inter-American Tropical Tuna Commission (IATTC) Convention Area.

2. Continue the development of EM in the Hawaii longline fisheries, and conduct the necessary catch handling study to address camera detection issues with species such as sharks. Analyze the necessary regulatory framework needed to implement EM at varying coverage and review rates, including, an analysis of long-term funding needs and a cost transition plan as described in the NMFS *Procedural Directive for Cost Allocation in Electronic Monitoring Programs for Federally Managed U.S. Fisheries* (Cost Allocation Directive; 04-115-02; May 7, 2019).

3. Continue the development and implementation of ER in the Pacific Islands Region Observer Program (PIROP) in collaboration with the West Coast Region Observer Program (WCROP) and the Pacific Fisheries Information Network (PacFIN). This joint effort will allow observers from both PIROP and WCROP to enter data into a single cross-regional ER system, and aid in the consolidation of redundant data management efforts.

4. Continue to work with stakeholders and partners (e.g., fisherman, State, Territories) to assess the feasibility of ER for federally managed fisheries in Hawaii, American Samoa, Guam, and the CNMI, and as practicable, assist respective parties with ER development and implementation in the fisheries that the State and Territories manage.

5. Implement mandatory ER in the U.S. purse seine fishery that occurs in the Western and Central Pacific Ocean (WCPO). Update the Terms and Conditions in the South Pacific Tuna Treaty (SPTT) to require mandatory ER for regional purse seine logbook data.

2 Introduction

The National Marine Fisheries Service (NMFS), in conjunction with Regional Fishery Management Councils (Councils), State Marine Fisheries Commissions (Commissions), and other partners continue to explore electronic technologies (ET) when developing new and/or improving existing fishery-dependent data collection programs. In May 2013, NMFS issued the *Policy Directive on Electronic Technologies and Fishery Dependent Data Collection*[1] (Policy Directive; *04-115*; updated May 7, 2019), which called for the development of Regional Electronic Technology Implementation Plans to address regionally specific fishery-dependent data collection challenges and ET to address those challenges. ET includes the use of vessel monitoring systems (VMS), electronic reporting (ER), video cameras, gear sensors, and automated image processing for electronic monitoring (EM), data collection technologies for at-sea observers, and other technologies that can improve the timeliness, quality, integration, cost effectiveness, and accessibility of fishery dependent data.

The Policy Directive encourages the consideration of ET to complement and/or improve existing fishery-dependent data collection programs to achieve the most cost effective and sustainable approach that ensures alignment of management goals, data needs, funding sources and regulations. To achieve this, the directive states:

1. NMFS encourages all fishery stakeholders to consider implementing ET options, where appropriate, to meet science, management, and compliance data needs.

2. Fishery-dependent data collection programs will be designed and periodically reviewed by NMFS to ensure effective, efficient monitoring programs that meet industry and government needs, increase coordination between regions and Councils, and promote sharing of research, development and operational outcomes.

3. Fishery-dependent data collection programs may be comprised of a combination of methods and techniques including but not limited to, self-reporting, at-sea observers, and dockside monitoring, as well as the use of ER and EM.

4. NMFS supports and encourages the evaluation/implementation of EM to meet monitoring and compliance needs in federally managed fisheries, including full retention fisheries that have an associated dockside program for catch accounting.

5. NMFS encourages the use of ET that utilize open source coding and data standards, where appropriate, to facilitate data integration, software and hardware flexibility, and long-term cost savings.

6. NMFS, in consultation with the Councils and subject matter experts, will assemble guidance and best practices for use by Regional Offices, Science Centers, Councils, Commissions, and stakeholders when they consider ET options. Implementation of ET in a fishery-dependent data collection program is subject to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and Council regulatory process, other relevant State and Federal regulations, and the availability of funds.

7. No ET-based fishery-dependent data collection program will be approved by NMFS if its provisions create an unfunded or unsustainable cost of implementation or operation contrary to applicable law or regulation. Funding of fishery-dependent data collection programs is expected to consider the entire range of funding authorities available under federal law, including those that allow collection of funds from industry.

8. NOAA Fisheries will work with Councils and stakeholders to develop a plan that transitions certain costs to the fishing industry, when allocation of monitoring costs between the agency and industry is deemed appropriate and approved under applicable law and regulations.

In 2015, in response to this Policy Directive, the Pacific Islands Regional Office (PIRO) and the Pacific Islands Fisheries Science Center (PIFSC), in consultation with the Western Pacific Fishery Management Council (Council), developed the NMFS Pacific Islands Region Electronic Reporting and Electronic Monitoring Implementation Plan[2] (NMFS 2015) to guide the use of ET for fisheries management in the Pacific Islands Region (PIR). Since that time,

the PIR has successfully trialed and implemented a voluntary ER program in the Hawaii longline fishery. Currently, 105 of 146 active vessels are participating in ER (approximately 72% overall participation). Of those 105 vessels, over 1,250 trips and over 16,000 e-log forms have been submitted to NMFS. E-log forms requiring resubmission are limited to 1 to 2 per month, which represents 0.33% (or less than 1 percent) of all e-log forms submitted.

The PIR has also successfully piloted a voluntary EM program in the Hawaii longline fishery with plans to expand and minimize data gaps. The program provided installations to 18 vessels in 2017 and provided an additional 20 installations for replacement or new systems in 2021.

Moving forward, this plan provides an update to the 2015 plan, forecasts the next five years (2021-2025), and establishes a regional vision for ET in fishery-dependent data collection programs. This plan will also briefly describe ongoing ET efforts in the region, and will be used to prioritize funding from internal and external funding sources. Status reviews of this plan will be done annually.

[1] NOAA Fisheries Policy and Procedural Directives can be found online at: https://www.fisheries.noaa.gov/national/laws-and-policies/science-and-technology-policy-directives

[2] NMFS. 2015. NMFS Pacific Islands Region Electronic Reporting and Electronic Monitoring Implementation Plan. 33 pg.

3 Vision For 2021-2025

The Council and NMFS manage fisheries in the U.S. Exclusive Economic Zone (EEZ or federal waters, generally 3-200 nautical miles from shore) around American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and Hawaii, and on the high seas through five fisheries ecosystem plans (FEPs) as authorized by the Magnuson-Stevens Act (16 U.S.C. § 1801 et seq.). These plans—the Hawaii, American Samoa, Mariana Archipelago, Pacific Remote Islands Areas, and Pacific Pelagic FEPs—are available from the Council's website at http://www.wpcouncil.org/fishery-ecosystem-plans-amendments/.

The PIR is committed to achieving sustainable fisheries and seafood, healthy marine ecosystems that provide stability for fishery resources, recovery of threatened and endangered species, and enhanced opportunities for commercial, recreational, and cultural activities in the marine environment. To achieve these goals, the PIR will explore the use of ET, where appropriate, when developing new and/or improving existing fishery-dependent data collection programs. This vision aligns with the Pacific Islands Geographic Strategic Plan 2020–2023, specifically:

- *Goal 1, Key Strategy 1.4* to modernize fishery information collection, management, and dissemination systems, and enhance cooperative data collection and sharing. These include the use of cost-effective technologies to observe, assess, conserve, and manage marine resources, utilization of new and emerging technologies to improve accuracy, efficiency, and access to commercial and non-commercial fishery data, provide rigorous protection of information technology resources, and enhance coordination of federal and State/Territorial data collection improvement efforts by utilizing the existing frameworks.
- *Also, Goal 3, Key Strategy 3.5* to institutionalize the use of innovative technologies. These include modernizing data management region-wide, strategically integrate, manage, and disseminate all data and data products, and investing in new capabilities and capacity to explore and develop new approaches, such as advanced technologies (e.g., unmanned survey vehicles), genomics, and artificial intelligence applications that will improve the quality of our research and management.

4 Regional Electronic Technologies Priorities

The following describes the regional priorities for 2021-2025:

1. Implement mandatory ER in the Hawaii and American Samoa longline fisheries. Mandatory ER will allow for near real-time data submissions to increase reporting accuracy, reduce data processing time, and more rigorously monitor and forecast the attainment of international longline catch quotas such as bigeye tuna catch limit under the Western and Central Pacific Fisheries Commission (WCPFC) Convention Area and in the Inter-American Tropical Tuna Commission (IATTC) Convention Area.

2. Continue the development of EM in the Hawaii longline fisheries, and conduct the necessary catch handling study to address camera detection issues with species such as sharks. Analyze the necessary regulatory framework needed to implement EM at varying coverage and review rates, including, an analysis of long-term funding needs and a cost transition plan as described in the NMFS *Procedural Directive for Cost Allocation in Electronic Monitoring Programs for Federally Managed U.S. Fisheries* (Cost Allocation Directive; 04-115-02; May 7, 2019).

3. Continue the development and implementation of ER in the Pacific Islands Region Observer Program (PIROP) in collaboration with the West Coast Region Observer Program (WCROP) and the Pacific Fisheries Information Network (PacFIN). This joint effort will allow observers from both PIROP and WCROP to enter data into a single cross-regional ER system, and aid in the consolidation of redundant data management efforts.

4. Continue to work with stakeholders and partners (e.g., fishermen, states, territories) to assess the feasibility of ER for federally managed fisheries in Hawaii, American Samoa, Guam, and the CNMI, and as practicable, assist respective parties with ER development and implementation in the fisheries that the State and Territories manage.

5. Implement mandatory ER in the U.S. purse seine fishery that occurs in the Western and Central Pacific Ocean (WCPO). Update the Terms and Conditions in the South Pacific Tuna Treaty (SPTT) to require mandatory ER for regional purse seine logbook data.

5 Council Actions

The following briefly describes past, current, and pending Council recommendations and actions related to the development and use of ET in fishery-dependent data collection programs. This list will be updated annually.

Note, the five FEPs developed by the Council provide the authority for data collection and reporting regulations at 50 CFR § 665.14. The specifics of "what and how" data are reported are specified by the NMFS PIR Regional Administrator. In general, the five FEPs do not have specific goals described for fishery-dependent data collection or monitoring. On April 17, 2007, NMFS published a final rule that allowed participants in U.S. domestic pelagic, crustacean, bottomfish and seamount groundfish, precious corals, and coral reef ecosystem fisheries of the western Pacific region the optional use of NMFS-approved electronic logbook forms in lieu of paper logbooks (72 FR 19123, April 17, 2007). Although supportive of development efforts, the Council has yet to take action on EM.

Recent Past Recommendations and Actions

The Council at its 183rd Meeting in September 2020 took final action to recommend a regulatory amendment for mandatory ER for vessels operating under the Hawaii longline limited access permit and vessel size classes C and D under the American Samoa longline limited access permit. The regulatory amendment would require submission of electronic logbook data within 24 hours of the completion of a haul and specifies exemptions in the event of technology malfunction. The Council recommended implementation of the regulatory amendment by July 1, 2021. The current draft of the amendment would implement the requirement as soon as the final rule is published perhaps in May 2021 for vessel operators where NMFS has provided the necessary equipment and user accounts.

At its 182nd Meeting in June 2020, the Council reviewed the Pacific Islands Region ER Implementation Plan and considered inclusion of the American Samoa longline fishery in the action, and to include an American Samoa representative on the ETSC. The Council also directed staff to include the American Samoa longline fishery in the mandatory ER amendment package scheduled for final action at the September 2020 meeting, and recommended setting a target implementation date of October 1, 2021. Lastly, the Council requested PIFSC work with the American Samoa longline fishery to begin training and rollout of ER as soon as possible.

At its 182nd meeting in June 2020, the Council:

- Directed staff to work with the Territory agencies in establishing the Amazon Web Services cloud account to initiate the ER data collection.
- Directed staff to work with NMFS PIFSC and Territory agencies in hiring one contractor for each territory to launch and maintain the ER system.

At its 181st Meeting in March 2020, the Council reviewed the options paper and recommended setting a target implementation date of January 1, 2021, for requiring mandatory ER in the Hawaii longline fishery. Furthermore, the Council directed staff to prepare the necessary amendment package with analysis and draft regulations for requiring mandatory reporting for the Hawaii longline fishery with a final action schedule for the September 2020 Council meeting.

The Council at its 181st Meeting in March 2020 directed staff to work with the Department of Marine and Wildlife Resources, in collaboration with PIFSC, to train bottomfish fishermen on the use of the ER application as soon as possible.

The Council at its 180th Meeting in October 2019, directed staff, in coordination with the ETSC, to develop an options paper regarding mandatory ER cost allocation, the necessary regulatory and non-regulatory changes for requiring daily ER transmissions, and the system requirements for providing data access to vessel owners and/or operators.

The Council at its 180th Meeting in October 2019 recommended the following to address issues surrounding the territory bottomfish fisheries:

- Recommended NMFS, in collaboration with the Council and territory agencies, implement the data collection recommendations from the Pacific Insular Fisheries Monitoring and Assessment Planning Summit in order to improve the fishery-dependent information to be used in future stock assessments. This would include mandatory licenses and reporting, supported by ER.
- Directed staff to conduct an extensive training for the fishermen and agency staff on the use and management of the ER application for the small boat fisheries.

The Council at its 178th Meeting in June 2019, requested the PIFSC convene an Electronic Technologies Steering Committee (ETSC) with suggested constituents PIRO, the Council, fishermen, and NOAA Office of Law and Enforcement (OLE) to further address remaining implementation challenges.

The Council at its 174th Meeting in October 2018, recommended, as initial action, to require mandatory ER in the Hawaii longline fishery, and further requested PIFSC work with fishermen and fisheries managers to address remaining implementation challenges.

6 Electronic Technologies Used In The Region

Sections 6.1 through 6.7 provide a brief overview of how ET is being utilized by category in the region.

6.1 Summary of Fisheries using Electronic Monitoring

EM has been active in the region since 1994 when the Hawaii longline fishery was the first fishery in the nation to carry VMS. Over the last 25 years, EM has evolved to include camera-based systems, which have been trialed in the region since 2009 with pilot projects in both the Hawaii longline fisheries and Main Hawaiian Islands (MHI) Deep 7 bottomfish fishery. EM may be suitable to other fisheries in the region as well, including the American Samoa longline fishery.

Electronic Monitoring in the Hawaii Longline Fishery

Since 2017, a pilot program has been conducted by PIFSC to determine the efficacy of EM in the Hawaii longline fisheries (both deep- and shallow-set fisheries). Currently, these fisheries are monitored by at-sea observers that are deployed on 100% of shallow-set trips and 20% of deep-set trips. In 2018, catch and protected species detection rates of EM were compared to detections by at-sea observers. Results from this study are detailed in a NOAA technical memo[3] (Carnes et al. 2019). A total of 238 fishing hauls (i.e., retrieval of fishing gear) were selected from 17 trips performed by vessels equipped with EM systems and observers. When EM data were compared to observer data, 89% of catch, including discarded and non-marketable fish, were detected. A data gap was identified for the detection of discarded sharks and non-marketable bycatch of lancetfish and snake mackerel. When these fish were removed from the analysis, 97% of retained and discarded species were identified by EM compared to the at-sea observer.

Moving forward, PIFSC will be conducting a catch handling study starting in 2021 on several EM vessels to address the species detection issues with discarded species, such as sharks. One outcome of this study will be a vessel monitoring plan that will outline the optimal camera configuration to detect all catch events. PIFSC is also using EM technology to compare the effectiveness of different tori line configurations to reduce incidental bycatch of seabirds. In addition, PIFSC will analyze the costs of EM with both Federal and third-party provider models at varying levels of overall coverage and video review, as well as, develop a cost transition plan as described in the Cost Allocation Directive.

Electronic Monitoring in the Main Hawaiian Islands Deep 7 Bottomfish Fishery

In 2017 and 2018, a pilot study was initiated to examine the potential use of EM for the Main Hawaiian Islands (MHI) Deep 7 bottomfish fishery. Hawaii's commercial bottomfish fishery targets primarily a limited number of high valued snapper species and one species of grouper with an annual catch limit of 492,000 lbs (2020-2021). In 2019, there were 318 licensed vessels in the fishery. The fishing vessels that make up this fishery are generally small to mid-sized vessels (20 to 65 ft) and typically make day or overnight trips. These relatively small vessels rarely have onboard observers to characterize the catch, fishing effort, undersized catch, or potential discards and bycatch.

Trials were conducted with a single vessel from September 2017 to December 2019 to determine its suitability for use in this fishery. A total of 22 trials were conducted, 9 trials from 2017 to 2018 and 13 trials from 2018 to 2019. During this pilot study, the two different EM systems tested required significant troubleshooting and subsequent improvements. The equipment did not properly record trips and video data were not obtained. This required working with the manufacturers of the EM equipment to troubleshoot and determine the source of malfunctions. This contributed to shortfalls in the number of trials.

When video data were available, it was of sufficient quality to provide catch information. A video reviewer scored each fishing trip. Fishing gear type used (tolling vs bottom handline), fishing effort (time spent fishing, number of

fishing lines), over all time spent on water, catch (number, species), and depredation events were recorded. There are no plans to expand this pilot or further develop EM in the fishery.

[3] Carnes M. J., Stahl J. P., Bigelow K. A. 2019. Evaluation of Electronic Monitoring Pre-implementation in the Hawaii-based Longline Fisheries. NOAA Tech Memo. NMFS-PIFSC. 38 pg. doi:10.25923/82gg-jq77.

6.2 Summary of Commercial Fisheries using Electronic Reporting

In the late 1990s, commercial lobster vessels fishing in the Northwestern Hawaiian Islands reported their catch, effort and other information via standardized email to PIRO using the VMS. This limited trial was the first application of ER in the region. In 2004, ER was trialed on a few Hawaii longline vessels, but this reporting method was not widely accepted and was ultimately abandoned. Based on a Council final action at the 123rd Meeting in June 2004, NMFS published a final rule in April 2007 that approved the optional use of ER for all federally managed fisheries in the Western Pacific that require logbook submission. Subsequently, NMFS published a notice in the Federal Register describing the certification requirements for the optional ER program (74 FR 32109, 7 July 2009), and developed the Electronic Logbook Certification Guidelines for Logbook Reporting in Pacific Island Fisheries[4] (NMFS 2009).

Electronic Reporting in the Hawaii and American Samoa Longline Fisheries

Since 2014, PIFSC has received support from both the Council and the NMFS' Fisheries Information Systems Program (FIS) to forward the development and implementation of ER in the Hawaii and American Samoa longline fisheries. The objective of this project is to develop and implement a mobile application, Elog-It, for electronic logbook data entry in both the Hawaii shallow-set and deep-set fisheries and the American Samoa longline fishery. Elog-It is a native Android application that collects and transmits encrypted catch and effort data via satellite to NMFS. Currently, 105 of 146 active vessels are participating in ER (approximately 72% overall participation). Of those 105 vessels, over 1,200 trips and over 16,000 e-log forms have been submitted to NMFS. E-log forms requiring resubmission are limited to 1-2 per month, which represents 0.33% of all e-log forms submitted. Moving forward, PIFSC will continue with ER outreach to train the remaining vessels based in Hawaii and to begin to train vessels based in American Samoa. The Council at its 183rd Meeting in September 2020 took final action to recommend a regulatory amendment for mandatory longline ER. The Council recommended implementation of the regulatory amendment by July 1, 2021. PIRO Sustainable Fisheries intends on issuing a proposed rule for mandatory longline ER in May 2021.

Electronic Reporting in the Small Boat Fisheries, including American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands

The Council, with input from NMFS, has developed a pilot progressive web application (PWA) to collect catch and effort data from fishermen and purchase information for vendors participating in the American Samoa, Guam and CNMI small boat fisheries. These fisheries are regionally and culturally important commercial, recreational, and subsistence fisheries. The Council and NMFS manage the bottomfish fisheries under the FEPs for American Samoa and the Mariana Archipelago through annual catch limits and accountability measures for management unit species (MUS), among other regulatory requirements. Currently data are typically collected through in-person boat- and shore-based creel surveys, commercial receipts, and catch and effort expansions are conducted through periodic boat activity inventories. These methods can be labor intensive, and due to limited resources in these island areas, do not consistently provide the breadth of data needed to accurately monitor MUS. For example, sampling away from the main islands in American Samoa and the CNMI has not been consistent over time, so existing data streams may not capture the full scope of the fishery. Furthermore, recent stock assessments by NMFS concluded that the bottomfish stocks in the Territories of American Samoa and Guam are overfished and the bottomfish stock in American Samoa is undergoing overfishing. These fisheries will require rebuilding plans, and comprehensive and reliable real-time data on total removals and effort are needed to assist in the management of the MUS across the Territories.

Because of its inherent reach and scalability, ER could provide fisheries managers access to better quality and timelier data needed to manage these fisheries and at a scale that cannot currently be met. The application under development can be accessed from a mobile phone or computer, so it will be accessible across the islands in the territories. Moving forward, the Council and NMFS, with the collaboration of territorial fisheries agencies, will assess the feasibility of ER in the American Samoa, Guam, and CNMI small boat fisheries to improve overall data collection and further improving PIFSC ability to conduct rigorous stock assessments of the MUS.

Electronic Reporting in the U.S. Purse Seine Fishery in the Western and Central Pacific Ocean

Almost all of the 24 U.S. purse seine vessels operating in the WCPO submit data electronically through an integrated Fisheries Information Management System. The software vendor has developed the ability to send more informative daily transmissions and PIFSC has produced ER data importation modules. Ingestion of the data into the database on a daily basis would allow PIRO to better monitor effort and fishing days on the high seas for compliance with Western and Central Pacific Fisheries Commission and South Pacific Tuna Treaty requirements.

Electronic Reporting in State-Managed Fisheries

In the state of Hawaii, every commercial marine licensee is required to submit a monthly report stating any marine life landed, released, lost to predation, and any bait used. Fishing reports are to be turned in by the 10th day following the month of any marine life interaction. Fishing reports are required whether or not fishing occurred within the month and a "Did Not Fish" report must be submitted. If any Deep 7 species are landed, lost to predation, or released, a trip report is required and due within 5 days of the trip end date.

In 2010, the Hawaii Division of Aquatic Resources (HDAR), with contractor Hawaii Information Consortium, developed an online reporting application for fishermen to report their data electronically. At that time, the only form available for online submission was the general monthly fishing report. Any specialized fishery reports (deep-sea handline, tuna handline, net, trap, dive, aku) were to be submitted via paper form. In 2012, HDAR implemented the Deep 7 bottomfish reporting form in place of the deep-sea handline fishery report and changed the reporting requirement to 5 days after the trip end date. They also modified the online reporting system to allow fishermen to submit this form electronically. The remainder of the forms (excluding aku reporting requirements) were implemented into the online reporting system in 2016. Fishermen are still allowed to report with paper submissions, but the data are all entered into the same online application.

[4] NMFS. 2009. Electronic Logbook Certification Guidelines For Logbook Reporting in Pacific Island Fisheries. NMFS-PIFSC. Version 1.7.

6.3 Summary of For-Hire and Recreational Fisheries using Electronic Reporting

Marine Recreational Information Program (MRIP) project: Specific to the MRIP spearfishing project in Guam and the CNMI, local spearfishermen recorded their catch in 'ispearfish.org' where they collected specific data for that fishery. This was a voluntary pilot project for the Council that has continued to be used by some of the local fishermen.

The territorial PWA has functionality to capture the non-commercial bottomfish sector of the fishery. Similar to the current creel surveys, some trips are non-commercial and some are mixed trips where portions of the catch are kept. These types of trips are documented in the territorial PWA.

The Hawaii Fishermen's Alliance for Conservation and Tradition has initiated a project to develop a fishing application to collect noncommercial catch and effort information. This App is currently in pilot/testing, and the developers are looking to create a working group to ensure that the App is going to suit everyone's needs, including the needs of PIFSC and PIRO.

6.4 Summary of Federal Dealers/Processors /Tenders using Electronic Reporting

There are no Federal Dealers/Processors/Tenders in Hawaii, American Samoa, Guam or the CNMI. In Hawaii, dealers are required to report based on State of Hawaii regulations. Both American Samoa and the CNMI have local dealer reporting requirements.

6.5 Summary of Observer Programs /Study fleet(s) Electronic Reporting Programs

In 2020, building off previous development efforts, the PIROP, WCROP, and PacFIN began a joint effort to develop ER for fisheries observers in both the Hawaii-based and California-based longline fisheries. The WCROP and PIROP place observers aboard fishing vessels with the primary focus of monitoring for protected species interactions, and additionally to record details on catch, fishing effort, and gear configuration, among others. Because the WCROP and PIROP overlap in jurisdiction and responsibility to monitor and report on Highly Migratory Species (HMS) fisheries in the Pacific, this project combines both developmental efforts and lessons learned from previously funded FIS projects into a single cross-regional system that will benefit both programs and aid in the consolidation of redundant data management efforts. Funding for this project is expected to be disbursed in spring of 2021, and the WCROP has been working with PacFIN to develop the Onboard Record Collection Application (ORCA) for the past several months on backend tables and data entry portals. Programming to add the longline fishery is expected to start in late spring 2021, with an anticipated completion of spring 2022.

6.6 Summary of the Vessel Monitoring System Program

VMS, in the United States, was first implemented in Honolulu in 1994. As a "test bed" for what was at that time new technology, resulting in the Pacific Islands Division (PID) being the only NOAA Office of Law Enforcement (OLE) division that is specifically required by federal regulation to buy, own, and maintain the VMS units for commercial fisheries. Like all regions, VMS in the PIR is a satellite surveillance system primarily used to monitor the location and movement of commercial fishing vessels. The system uses satellite-based communications from on-board transceiver units, which certain vessels are required to carry. The transceiver units send position reports that include vessel identification, time, date, and location, and are mapped and displayed for end users. Each vessel typically sends position reports once an hour. Alerts can be sent to the VMS technicians and other personnel when a particular vessel location might require additional inquiry.

PID depends on VMS to support law enforcement and monitoring activities and to prevent violations of federal fisheries laws and regulations. VMS also helps OLE and other surveillance platforms to focus on areas with the highest potential for significant violations. The system operates 24 hours a day, 7 days a week with great accuracy, which is why the program is of interest to other users, including the U.S. Coast Guard, other government agencies, academia, States, and fisheries managers and scientists. VMS data are, by law, subject to strict confidentiality requirements. Other uses for VMS include:

- Managing sensitive and protected areas, like marine sanctuaries;
- Monitoring activity and arrivals in port to plan for sampling efforts;
- Supporting catch share programs;
- Tracking, monitoring, and predicting fishing effort, activity, and location;
- Managing observer departures and arrivals;
- Verifying and validating data from other sources;
- Identifying fishing vessels; and
- Transmitting other data (e.g., declarations, power-down notices, ER etc.).

PID has some unique logistic challenges not faced by the other regions, but maintains more control of its assets. The SPTT and WCPFC require PID to cooperate with the many island and distant-water fishing nations in our region and with the primary VMS staff in the Western Pacific, including, the Forum Fisheries Agency and the WCPFC. Vessels from the many flag States with fishing vessels targeting HMS in the region are tracked in VMS by PID under international agreements. In addition, the majority of US vessels in the PIR are required to report not only to the U.S. VMS program, but also to WCPFC VMS program, requiring frequent interaction between PID staff and the WCPFC staff. VMS is required under the following permits/authorizations:

- Hawaii Longline Limited Entry Permit;
- Northern Mariana Islands Bottomfish Permit (depending on vessel length–currently no bottomfish permits are operational);
- American Samoa Longline Limited Entry Permit (depending on vessel length–large class vessels);
- Vessels with a WCPFC Area Endorsement in addition to an underlying permit (authorized to fish for HMS on the high seas in the WCPFC Convention Area); and
- Vessels permitted to operate in the Papahanaumokuakea Marine National Monument.

Information on VMS type approval is available at:

https://www.fisheries.noaa.gov/national/enforcement/noaa-fisheries-type-approved-vms-units.

7 Challenges Impending Implementation Of ET Programs

The following provides a brief summary of challenges impeding the development of ET programs in the Pacific Islands Region. To date, the majority of ET programs in the region have been developed using grant funds provided annually through the FIS. The future of ET in the region, especially the use of EM, will depend on securing long-term sustainable funding. The use of ET to replace or augment existing monitoring tools may also require additional rulemaking.

Electronic Monitoring in the Hawaii Longline Fishery

The largest discrepancies in identifications between EM data and observer data likely occur due to crew handling practices for discarded species and the EM cameras field of vision. This can be particularly problematic for shark species that may be cut free from the fishing line before coming into view, and species such as lancetfish, snake mackerel, and escolars, which are discarded over the vessel rail instead of landed on deck.

With regard to EM implementation, it will be important to determine the scope, mechanism, and cost basis to supplement observer coverage and to identify objectives for meeting various Magnuson-Stevens Act, Endangered Species Act (ESA), and Marine Mammal Protection Agency (MMPA) data and monitoring needs. One current EM research priority is to determine if mortality and serious injury of marine mammals can be assessed from EM video. This research will help identify which Magnuson-Stevens Act, ESA, and MMPA objectives can be met with EM and better inform how EM can supplement the observer program.

EM reviewers performed well at tuna and billfish identification to family level for retained catches; however, there was some difficulty with identification to the species level. Bigeye and yellowfin tuna are easy to distinguish with EM when key characteristics are visible, however, some tuna, particularly juveniles, lack distinguishing characteristics visible with the current camera configurations. Improvements could be made with tuna identification by adding an additional camera that is zoomed in to the processing area or by upgrading existing cameras to a higher megapixel configuration that would allow visibility of more distinguishing characteristics. Species identification between striped and blue marlins could be improved with changes in fishermen handling. For example, similar to observer protocols, fishermen could briefly extend the dorsal fin of billfish, which would easily allow the reviewer to distinguish between species (i.e., a striped marlin dorsal fin extends greater than body depth, whereas a blue marlin dorsal fin is less than body depth).

Electronic Reporting in the Hawaii and American Samoa Longline Fisheries

Existing program challenges in the Hawaii and American Samoa longline ER program can be categorized as either development or deployment challenges. Development challenges include the addition of new features, or in some cases, fixing existing features to function as intended, both of which require resources and development time. Other development challenges include the addition of new VMS vendors, as new systems must be made compatible with ER software to leverage near real-time data transmission capabilities. The inclusion of new VMS vendors may also require resources and development time. Deployment challenges include language barriers when onboarding new participants or conducting fleet-wide outreach, as well as the unpredictable timing of vessels coming in-and-out of port. These development and deployment challenges are being addressed in an ER implementation plan specific to the Hawaii and American Samoa longline fisheries

Electronic Reporting in the Territorial Small Boat Fisheries, including American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands

The success of implementing ER in the territories is contingent on local regulations to make fishing licensing and reporting mandatory. So far, the CNMI has mandatory license and reporting regulations while Guam is still

under development. American Samoa has mandatory reporting for the fish dealers but not fishermen. Developing regulations for the non-commercial sector of the fishery is highly unlikely.

Implementing ER in the territories requires continuous training and outreach on the importance of reporting timely and accurate data. These types of effort tend to gain initial support and may diminish over time. Keeping the momentum of ER efforts would require local fisheries agencies to take ownership of the data collection system with support from Federal partners.

The fisheries in the outer islands of Manua in American Samoa and Tinian and Rota in the CNMI would benefit from the features of ER. However, Wi-Fi hotspots in these areas are limited. Wireless infrastructure should be established at the ports and marinas in these islands. Long-term funding is needed to maintain these hotspots.

Observer Program Electronic Reporting

In 2020, building off previous development efforts, the PIROP, WCROP, and PacFIN began a joint effort to develop ER for fisheries observers in Pacific Islands and California-based longline fisheries. The WCROP has been working with PacFIN to develop the ORCA for the past several months on backend tables and data entry portals. Programming to add the Hawaii and west coast longline fisheries is expected to start in late spring 2021, with an anticipated completion of spring 2022.

Electronic Reporting in the U.S Purse Seine Fishery

Most of the U.S. purse seine vessels in the WCPO have licenses that allow them access to fish in the EEZs of Pacific Island Parties to the South Pacific Tuna Treaty. Reporting requirements under the South Pacific Tuna Treaty are contained in Regional Terms and Conditions to the Treaty, and changes to the Regional Terms and Conditions would need to occur to allow for mandatory ER.

8 Research and Development

The following provides a brief summary of current research and development of ET programs in the Pacific Islands Region.

Electronic Monitoring in the Hawaii Longline Fishery

EM video review is laborious and time-consuming, which results in large operational costs. As a result, PIFSC has been conducting research to streamline processing of EM footage. One study has been completed that evaluated the preferred playback speed (4x, 8x, and 16x that of standard playback speed) for EM video review that would reduce time and cost of review while maintaining accuracy of detection (Stahl and Carnes 2020[5]). Other research is being conducted on using computer vision technologies to automate fish and protected species detection to reduce the time necessary to process a trip, and therefore reduce overall program costs.

Beginning in January 2019, PIFSC started building an image library from EM video collected aboard Hawaii longline (deep- and shallow-set) fishing vessels for the purposes of testing the feasibility of using machine learning (ML) to detect fish and protected species in these fisheries. ML algorithms were trained using the open-source tool Video and Image Analytics for Marine Environments software (VIAME) with annotated images of fish, protected species, and fishing events. Preliminary training indicates that ML algorithms have the ability to detect fish on deck and differentiate branch lines that have caught fish versus those that are "empty". In addition, the ML using VIAME software allows for "tracking" of catch, fishing gear, and protected species over multiple video frames, which may allow ML to determine different outcomes, for example the disposition of a fish, such as kept versus discarded. Current research is focused on training additional algorithms while expanding the image library for trainings to include more protected species and fish that are in the water instead of just on deck. The objective of training new algorithms is to improve the accuracy of detections by reducing the misidentifications, as well as, the false positives (e.g., labeling an inanimate object on deck as a fish).

A catch-handling study will begin in 2021 to improve the detection of species that are discarded using EM footage. This study will determine the most efficient catch handling and lighting configurations for speciation of sharks and other species that are released without landing.

In addition, protected species research will begin in 2021 to determine if mortality and serious injury of marine mammals and post-interaction mortality of sea turtles can be assessed from EM footage. This research will determine if modifications need to be made to camera equipment, fishing gear, or handling to improve the ability of a reviewer to make these determinations from EM footage.

Electronic Reporting in the Hawaii and American Samoa Longline Fisheries

Based on recommendations from industry, PIFSC, in collaboration with NMFS Office of Science and Technology, has been investigating the feasibility of hosting logbook data on a secure website that is accessible to fishery permit holders. This website would allow permit holders to review the data that are collected and submitted by vessel operators using ER.

Electronic Reporting in the Territorial Small Boat Fisheries, including American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands

Implementation of the territorial ER would require integration of the fisher reports and vendor reports. The report integration will allow verification of the catch reports by fishermen and the amount of fish that ends up in commerce. This would also allow the verification of the non-commercial segment of the total catch.

Observer Program Electronic Reporting

See Section 7 for current Observer Program ER development.

Electronic Reporting in the U.S. Purse Seine Fishery

There are currently no Research and Development aspects for ER in the U.S. Purse Seine Fishery.

[5] Stahl J. P. and Carnes, M. J. 2020. Detection Accuracy in the Hawai'i Longline Electronic Monitoring Program with Comparisons between Three Video Review Speeds. PIFSC Data Report DR-20-012. Issued 18 September 2020. https://doi.org/10.25923/n1gq-m468

9 Data Integration and Modernization

Electronic technologies currently used in the Hawaii longline fisheries include EM, ER, and VMS. The ER application, Elog-It, was developed for integrated use with the vessel's onboard VMS system. The ER tablet can be connected to the VMS unit via Bluetooth or Wi-Fi depending on the VMS unit make and model. The established connection is used to both transmit data from the tablet while at sea and pull live GPS locations from the VMS.

EM and ER system infrastructure are not yet integrated and both systems are processed and reported independently of each other. After ER data are received and processed into the Oracle database, these data are integrated with other datasets, such as State of Hawaii dealer reported data, to produce numerous data products that support reporting requirements and quota management. Changes are planned to improve efficiency of back-end data processing and integration in anticipation of the near real-time data stream.

10 Data Standards and Interoperability of ET Systems

ER in Hawaii and American Samoa Longline Fisheries: There are currently no data standards published for ET providers. The region is reviewing and updating an outdated draft of ER certification guidelines for the logbook reporting in the Pacific Region (see footnote 4).

11 Costs of EM Programs

The Policy Directive on Electronic Technologies and Fishery Dependent Data Collection (04-115-02) illustrates the cost allocation in EM programs for federally managed U.S. fisheries. NOAA Fisheries has identified two categories of costs associated with EM programs: sampling costs and administrative costs.

The following represents an example of the annual cost structure of an implemented EM program for the Hawaii deep-set longline fishery considering a 25% coverage rate. Projected sampling costs can be based on a third-party (industry) and/or a NOAA Fisheries model. For simplicity, only a federal model is illustrated, as there are currently no third-party providers for cost estimation and comparison.

Sampling Costs		
EM System and Monitoring Plan	**Federal costs**	**Comments**
Equipment purchase, leasing, and installation	$533,333	Cost for EM systems on the entire Hawaii-based longline fleet with 160 vessels. Assumed cost is $10,000 per system with life expectancy estimated at 3 years.
Maintenance, system upgrades, and repairs	$321,000	Salary and overhead for 3 technicians at $107,000 each.
Training for captain and crew	$0	Performed by technicians. Included in costs for “maintenance, system upgrades, and repairs”.
Development of Vessel Monitoring Plans	$0	Performed by technicians and EM Project Manager. Included in costs for “maintenance, system upgrades, and repairs” and "service provider fees and contract".
Sub-Totals	**$854,333**	

With a federally funded EM program, the federal government will own the collected EM data and be responsible for storage. Federal contractors may be utilized for installation, maintenance, and/or video review of EM data. With a third-party model, the federal government and the fishing industry will share the costs of an implemented EM program. With a third-party model, the fishermen will own the EM data, which will be collected and stored by a third-party. Only records that are sent to the federal government will become federal records.

Sampling Costs Continued		
EM Data and Provider Services	**Federal costs**	**Comments**
Video and Data Transmission	$158	No transmission needed for Hawaii landings; these data will be collected by technicians in Honolulu and are included in the costs for "Maintenance, system upgrades, and repairs".
		Data from California landings will be mailed at $7.50 per mailing. Projected costs were based on 21 California landings in 2019.

Sampling Costs Continued		
EM Data and Provider Services	**Federal costs**	**Comments**
Video Review and Processing		
Option 1 - ~25% of sets reviewed.	$749,000	Cost for 7 EM reviewers at $107,000 each
Storage of Imagery and Data	$20,000	Storage of EM data within the normal sampling life cycle. $20,000 is an estimate for physical storage, cloud storage is estimated as $57,600
Service Provider Fees and Contract	$125,000	Cost for one EM Project Manager to coordinate EM data collection and contracts for any system installation, maintenance, or EM video review.
Other (Software developer/maintenance)	$180,000	Cost for federal (FTE ZP4 DEV) software developer. After the first couple of years, this cost would likely be reduced without the need of dedicated staff.
Sub-Totals	**$1,074,158**	
Total Sampling Costs	**$1,928,491**	

For all EM programs, NOAA Fisheries will be responsible for the administrative costs, including the costs of setting standards for such programs, monitoring program performance, and providing administrative support to address science, enforcement, and management needs, except where the Magnuson-Stevens Act specifically authorizes the collection of fees for these costs. The following represents associated administrative costs.

Administrative costs		
Program Support	**Federal costs**	**Comments**
Council support, rulemakings, and permitting	$25,000	EM Outreach and Review Manager to work with Council and other staff to provide guidance on rulemaking and permitting for EM. Costs are estimated at 15% of $125,000.
Staff time to review equipment on vessels and VMPs	$18,750	EM Outreach and Review Manager to review installed EM systems and ensure in accordance to VMPs.
Facilitate communications participants and EM providers	$75,000	EM Outreach and Review Manager will provide EM outreach and feedback to fishermen from video review and audit to improve data collection. As well as, communications with fishermen and EM providers to perform installation, maintenance, disk retrieval. Costs are 60% of the time of EM Outreach and Review Manager at total cost of $125,000.
Manage vessel/video review selection	$62,500	EM Outreach and Review Manager will coordinate with review staff to appropriately sample 25% of vessels. Costs are 50% of the time of EM Outreach and Review Manager at total cost $125,000.
Sub-Totals	**$181,250**	

Certification of EM Providers	Federal costs	Comments
Review provider contracts	$31,250	EM provider certification contract review. Certification would allow providers to apply for federal contracts. Certification could occur on a 3-year life cycle, so annual costs are shown spread between 3 years based on total costs for certification support at 25% of $125,000.
Examine software, hardware, and data reports	$93,750	EM provider certification system review. Certification would allow providers to apply for federal contracts. Certification could occur on a 3-year life cycle, so annual costs are shown spread between 3 years based on total costs for certification support at 70% of $125,000.
Sub-Totals	**$125,000**	
EM Program Performance Monitoring	**Federal costs**	**Comments**
Auditing		Review of 10% of the 25% video reviewed. Video review is ~$749,000 with 10% at $74,900. Perhaps not needed if there is a third-party model.
10% video review is audited	$75,000	
Reviewing video and data to optimize sampling rates	$25,000	NOAA EM analyst will review selected EM video footage to determine if adjustments need to occur with the 25% sampling rates, for example, is more sampling needed to represent protected species interactions? Costs are for a portion of the total salary ($100,000) of one NOAA EM analyst at 25% time.
Analyzing data and integrating into monitoring program	$25,000	NOAA EM analyst will analyze EM data and work with PIFSC/PIRO staff to properly integrate EM data into monitoring. Costs are for a portion of the total salary ($100,000) of one NOAA EM analyst at 25% time.
Subtotals	**$125,000**	
Video and Data Storage	**Federal costs**	**Comments**
Video storage and access	$0	Costs for storage of federal records that are maintained past the normal sampling life cycle. For example, protected species footage.
EM database maintenance	$25,000	Costs for annual EM database support.
Other (Database development)	$62,500	Support for the development of an EM database to store and extract EM data. This would include the costs of technical staff to develop the database with the assistance of the EM analyst. Costs include 6 months of staff time for development. This cost would only be needed for the first year.
Subtotals	**$87,500**	
Total Administrative Costs	**$518,750**	
Total Administrative and Sampling Costs	**$2,447,241**	

12 EM Cost Transition Plans

The EM cost allocation for the Hawaii and American Samoa permitted longline fisheries is currently unknown. The actual allocation will need to be discussed among constituents and formulated in a regulatory framework with EM implementation.

13 Regional Communications and Outreach Plan

This following provides a brief overview of communication efforts for ET programs to both fisherman and the wider public. Future efforts may include hosting webinars, workshops, meetings, and other opportunities for engagement.

Electronic Monitoring in the Hawaii Longline Fishery

Because EM in the Hawaii longline fishery is still in the early stages of its development, no major communications efforts have been made to the fleet beyond soliciting volunteers for the program (currently 20). NMFS staff have made several presentations to the Council and Board of Directors of the Hawaii Longline Association (HLA) on the utility of ER and EM in the Pacific Islands Region. In February of 2020, representatives from the Pacific Islands Region, including PIFSC, PIRO, and HLA, presented "Regional EM Experiences" panel at the National Electronic monitoring Workshop in Seattle, Washington. Both the final workshop report and a recording of the panel can be found at https://em4.fish/national-em-workshops-report-videos/. More information on the EM pilot project in the Hawaii longline fishery is available to the public online at https://www.fisheries.noaa.gov/feature-story/noaa-fisheries-works-partners-implement-electronic-monitoring-pacific-islands-region.

Electronic Reporting in the Hawaii and American Samoa Longline Fisheries

NMFS has solicited voluntary participation in the Hawaii longline fishery ER program since July 2018. Much of the ongoing communication with the fleet takes place at NMFS field office at Pier 38 in downtown Honolulu, Hawaii. NMFS outreach at Pier 38 has been a successful approach at engaging with fisherman. PIFSC staff have noted that incorporating one-on-one, hands-on training immediately after deploying an ER system on a vessel helps captains successfully transition from traditional paper logbook reporting to ER much easier. There are three ethnicities that dominate vessel operators in the Hawaii longline fishery: Caucasian, Korean and Vietnamese. The Vietnamese sector is the largest and outreach has been improved by having an English-Vietnamese interpreter. NMFS staff have also successfully assisted captains on Hawaii-permitted longline vessels that are California-based in remote setup by visiting California or assisting via telephone. Similar communication efforts are also underway to expand ER for the American Samoa longline fleet. The possibility of holding outreach and training classes has also been noted, but no classes have been held to date due to the preference of one-on-one training.

A brochure has been produced that illustrates what the ER program is, its benefits, and contains NMFS contact details to join the program. Both a quick guide and comprehensive guide have been produced on how to use the ER application as well. The English guides have been translated to Vietnamese and Korean languages and are available on the tablet. PIFSC is working with the Council staff to translate theses guides into Samoan as many of the American Samoa longline operators predominantly speak Samoan.

Short instructional videos are currently in production. The videos walk fishermen through logging in to Elog-It, entering and sending data, reviewing data, and keeping data safe. Segments also cover general responsibilities when using a tablet and common troubleshooting tips. They will be viewable from the tablet's library and will supplement one-on-one training and the user and quick guides. The videos will initially be in English and Vietnamese, but because instruction is provided by text overlay, they will be easier to translate into other languages as well as update.

14 List of Tables

Table 14.1. Summary of Fisheries Participation in Electronic Monitoring Programs

Fishery	No. of EM Vessels	No. of Active Vessels in Fishery	Observer Coverage	EM Coverage	% video Reviewed	Implementation Type/Date	Funds	Purpose of EM	Comments
Pilot Study – Hawaii-based Deep- and Shallow-set Longline	18	164 (Permits)	20% Deep-set & 100% Shallow-set	~15% Deep-set & ~33% Shallow-set	Varies[1]	NA	NMFS	Testing the efficacy of EM to meet fishery monitoring objectives	
Pilot Study - MHI Deep 7 Bottomfish	1	340 (Licenses)	None Mandated	49 trips	100%	N/A	NMFS	Testing the efficacy of EM to catalogue catch	EM systems required significant troubleshooting. When videos were available, catch data were obtainable.

[1]Varies - A total of 238 fishing hauls (i.e., retrieval of fishing gear) were selected from 17 trips performed by vessels equipped with EM systems and observers with the objective of comparing catch accounting between EM and at-sea observer collected data using concurrent fishing trips (Carnes et al. 2019).

Table 14.2. Summary of Participation in Electronic Reporting Programs for Commercial fisheries

Fishery	No. of ER Vessels	No. of Active Vessels in Fishery	Data Submitted to/ Managed By	Required/ Volunteer	Reporting Frequency (Haul, Trip, Week, Month	Purpose of ER	Comments
Hawaii-based Deep- and Shallow-set Longline	76	146	PIFSC	Volunteer; Mandatory ER implementation target July 1, 2021	Haul, daily	More accurate bigeye tuna catch limit monitoring	Council took final action at 183rd Meeting in September 2020
American Samoa	0	14	PIFSC	Volunteer; Mandatory ER implementation target July 1, 2021	Haul, daily	More efficient than mailing logsheets to Hawaii	Council took final action at 183rd Meeting in September 2020.

Table 14.3. Summary of Participation in Electronic Reporting Programs for For-Hire and Recreational Fisheries

There is limited participation in ER for For-Hire and Recreational Fisheries in Hawaii, American Samoa, Guam or the CNMI. See Section 6.3.

Table 14.4. Summary of Participation in Electronic Reporting Programs for Federal Dealers/Processors/Tenders

There are no Federal Dealers/Processors/Tenders in Hawaii, American Samoa, Guam or the CNMI.

Table 14.5. Summary of Participation in Electronic Data Collection for Observer Programs/Study Fleets

Electronic Data Collection for Observer Programs in currently under development.

Table 14.6. Summary of Participation in Electronic Vessel Monitoring System Programs

Note that these numbers were derived based on VMS units actively reporting in VMS as of 2 Feb 2020

OLE Pacific Islands Division (Pacific Islands Region) VMS Vessel Population /Fisheries

VMS Fishery Category	# of VMS Vessels[1]	Data Submitted to /Managed by	Comments
American Samoa Longline (VMS)	18	OLE (VMS), PIFSC (logbooks)	Currently, no e-forms. Tablets are optional (normally at vessel owner's discretion if they use, and pay for, email, weather or other commercial applications)
Hawaii Longline	145	OLE (VMS), PIFSC (logbooks)	Some overlap of VMS vessels with West Coast Region
Albacore Troll	24	OLE (VMS), WCRO (logbooks)	Some overlap of VMS vessels with West Coast Region
US Purse Seine (under South Pacific Tuna Treaty)	35	OLE (VMS), PIRO/PIFSC (logbooks)	Some overlap of VMS vessels with West Coast Region
High Seas, IATTC, WCPFC	Overlaps with other fisheries	Overlaps all regions	Depends on vessel location (generally high seas) and underlying permits

[1] Note that these numbers were derived based on VMS units actively reporting in VMS as of 2 Feb 2020