**Summary**

In early 2009, the Western Pacific Regional Fishery Management Council (Council) partnered with the Hawaii Longline Association and Archipelago Marine Research Ltd. to conduct a pilot study exploring the use of electronic monitoring (EM) in the shallow and deep set components of the Hawaiian pelagic longline fishery.¹

- One of the first ever EM studies on pelagic longline fisheries
- Vessels were equipped with GPS receivers, hydraulic pressure sensors, winch sensors, satellite modems, and system control boxes.
- Systems were powered continuously to record sensor data (e.g., location, time, speed, hydraulic and winch activity, system events, etc.) at a 10-second frequency.
- Image data was recorded when hydraulic pressure or winch rotations exceeded a preset threshold, indicating activation of fishing gear.
- Vessel data were recorded onto a 500GB hard drive which was estimated to last four to five weeks of normal pelagic longline operations.
- The satellite modem was used to transmit an hourly synoptic report consisting of vessel speed and location, sensor activity, video triggers and EM system performance data.

**Hawaii longline deep-set tuna fishery**

- 130 vessels landing fresh fish (ave. length 70 ft)
- Targets bigeye, retains yellowfin, and other pelagic species
- 17-20 days/trip (17,000 sets/yr)
- Set gear during day; haul gear at night

**Observer coverage:** 20%

- main objective is to monitor protected species interactions

**Hawaii longline shallow-set swordfish fishery**

- 20 vessels seasonally (Dec.- May) landing fresh fish (ave. length 75 ft)
- Targets swordfish, retains yellowfin, bigeye and other pelagic species
- 20-30 days/trip (~1500 sets/yr)
- Set gear at night; haul gear during day

**Observer coverage:** 100%

- main objective is to monitor protected species interactions; sea turtle hard limit

**Project Objectives:**

- Can electronic monitoring image data provide images of sufficient resolution and clarity to allow an EM image reviewer to accurately record the number of hooks and counts of target and non-target species?

- Can electronic monitoring image data provide images of sufficient resolution and clarity to allow an EM image reviewer to identify interactions with various species of sea turtles, marine mammals, and seabirds as well as detect hooking location and release condition?

- Are results from video monitoring similar to those obtained from on-board observers?

**Summary of Project Results:**

- Each vessel completed between 3 and 6 trips, for a combined total of 320 days at sea, 7,600 hrs of sensor data, 3,000 hrs of images corresponding to 159 hauls.
- EM systems provided more accurate data on fishing time, locations -0.4 % difference between observer data and EM data with regards to number of hooks and retained catch.
- Close agreement between EM and human observers on swordfish species identification, but other billfish (marlin, sailfish, spearfish) were inconsistent.
- EM and observer retained bigeye catch within 2% and 10% for all tuna, but individual species identification varied.
- EM image reviewers estimated less total catch than human observers by 16%, primarily due to differences between monitoring of discarded species suggesting significant portion of discarded catch not visible in camera field of view.
- 3 interactions with leatherback turtles were recorded by both EM and human observers
- 3 seabird capture events were recorded, one detected by both EM and observer, and two seen by one but not the other.
- No marine mammals detected by either EM or human observers.

**Recommendations:**

- Improved camera placements; more cameras, structured handling procedures.

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**References**